School of Medicine and Public Health
UNIVERSITY OF WISCONSIN-MADISON

CT Protocols for Optima CT660

Copyright © 2021

REF **Rev: 7.0**

Manufacturer:
School of Medicine and Public Health
University of Wisconsin-Madison
610 Walnut Street
Madison, WI 53726

Manufactured in USA

University of Wisconsin-Madison CT Protocols for Optima CT660

Table of Contents

Page No.

Table of Contents 2

Changes from Revision 6 to Revision 7 7

UW Protocol Resource Ecosystem 10

Metal Artifact Reduction (MAR) Guidance 12

CT Protocol Scanner Compatibility Information 13

Direct Multi-Planar Reformat (DMPR) Protocols 14

Size Selection 16

Size Selection for Neck and C-Spine 18

Trauma Chest and CAP T-Spine Workflow 19

CT Perfusion Protocol: (Specific Instructions) 20

Adult Protocols

Abdominal Protocols:

- Chest/Abd/Pelvis with IV Contrast: # 5.4/5.5/5.6 24
- Chest/Abd/Pelvis without IV Contrast: # 5.7/5.8/5.9 29
- CTPA for PE with Abd/Pelvis: # 5.19/5.20/5.21 33
- Trauma - Chest: # 5.22/5.23/5.24 39
- Trauma - Chest/Abd/Pelvis: # 5.25/5.26/5.27 42
- Abd/Pelvis: # 6.1/6.2/6.3 48
- Trauma - Abd/Pelvis: # 6.4/6.5/6.6 51
- High Image Quality Cancer Follow-up Abd/Pelvis: # 6.7/6.8/6.9 56
- Abd/Pelvis - Flank Pain: # 6.10/6.11/6.12 59
- Limited Follow-up Kidneys Only: # 6.13/6.14/6.15 61
- Abd/Pelvis - Colonography: # 6.16/6.17/6.18 63
- Abd/Pelvis - Urography: # 6.22/6.23/6.24 68
- Abd-Liver - Biphasic: # 6.25/6.26/6.27 72
- CTA Abd-Liver - Triphasic: # 6.28/6.29/6.30 76
- Abd-Adrenal Gland - Adenoma: # 6.31/6.32/6.33 81
- Abd - Pancreas Cancer (Neoplasm Screening): # 6.40/6.41/6.42 86

Abdominal Protocols (cont.):

Abd/Pelvis - Kidney Tumor: # 6.49/6.50/6.51 89
CTA Abd - Renal Donor: # 6.52/6.53/6.54 93
Abd-Small Bowel Enterography: # 6.55/6.56/6.57 97
CTA Abd - Obscure GI Bleed: # 6.58/6.59/6.60 100
CTA Abd - Mesenteric Ischemia: # 6.61/6.62/6.63 104
Urothelial Tumor Follow-Up: # 6.70/6.71/6.72 108
Abd/Pelvis - Venogram (Pre-IVC Filter Removal): # 6.73/6.74/6.75 112
CTA Abd/Pelvis - Active Bleeder: # 6.79/6.80/6.81 115
Abd-Liver - Hepatocellular Carcinoma (HCC): # 6.82/6.83/6.84 120
Abdominal Wall Flap CTA: # 6.88/6.89/6.90 125
Cystogram: # 8.10/8.11/8.12 128
Body Pelvis: # 8.16/8.17/8.18 131
Abd/Pelvis - R/O Hernia (Use Routine Abd/Pelvis Protocol): # 6.1/6.2/6.3 134
Neck/Chest/Abd/Pelvis 137

Neuroradiology (Neuro) Protocols:

Brain - Routine (Helical Mode): # 1.1 140
Brain - Helical Scan with Angled Axial Reformations: # 1.2 146
Brain (Axial Mode): # 1.3 151
3D CT (Craniosynostosis, Congenital Facial Anomaly): # 1.5 156
Stroke Deluxe - Total Cerebrovascular: # 1.6 159
CTA Head Only (Stenosis, Aneurysm, Unknown Bleed): # 1.7 167
CT Venography Head & Neck: # 1.9 174
Stereotactic Head: # 1.10 181
Orbit - Routine: # 2.1 184
Facial Trauma - Routine: # 2.5 189
Pituitary Gland and Cavernous Sinus: # 2.6 194
Sinuses - Diagnostic: # 2.7 200
Temporal Bone: # 2.11 206
DentaScan: # 2.13 210
Adult Neck- Routine: # 3.1/3.2/3.3 214
Neck (Parathyroid Adenoma): # 3.4/3.5/3.6 221
Neck (Salivary Gland): # 3.8/3.9/3.10 229
CTA Neck Only (Cerebrovascular Disease): # 3.11 236
Neck (Hypervascular Papillary Thyroid): # 3.13/3.14/3.15 241
Adult Cervical Spine (without Metal): # 3.16/3.17/3.18 248
Adult Cervical Spine (with Metal): # 3.19/3.20/3.21 254
Adult Lumbar Spine (without Metal): # 7.1/7.2/7.3 261
Adult Thoracic Spine (without Metal): # 7.4/7.5/7.6 267
Adult Lumbar Spine (with Metal): # 7.10/7.11/7.12 273
Adult Thoracic Spine (with Metal): # 7.13/7.14/7.15 279

Chest Protocols:

Chest - Standard (Routine & High-Resolution): # 5.1/5.2/5.3 285
Chest - Low Dose Follow-up/Screening: # 5.10/5.11/5.12 290
Chest - CTPA for PE: # 5.16/5.17/5.18 294
Chest - Esophagography: # 5.51/5.52/5.53 299
Chest - Dynamic 3D Airway: # 5.70/5.71/5.72 304

Cardiovascular (CV) Protocols:

Upper Extremity CTA: # 4.10/4.11/4.12 308
Non-Gated CTA (Chest/Abd/Pelvis): # 5.28/5.29/5.30 312
Retrospectively-Gated CTA Chest (Non-Coronary): # 5.31/5.32/5.33 318
Gated Chest and Non-Gated Abd/Pelvis CTA: # 5.34/5.35/5.36 323
Prospectively-Gated Coronary CTA: # 5.37/5.38/5.39 329
Retrospectively-Gated Coronary CTA: # 5.40/5.41/5.42 334
TAVI CTA: # 5.43/5.44/5.45 339
Prospectively-Gated CTA Chest (Non-Coronary): # 5.46/5.47/5.48 345
Subclavian CT Venogram: # 5.55/5.56/5.57 350
Prospectively-Gated Left Atrial Appendage: # 5.73/5.74/5.75 353
Thoracic Outlet: # 5.83/5.84/5.85 359
Post-Endostent Non-Con Volume Change (Abd/Pelvis only): # 6.43/6.44/6.45 363
Lower Extremity CTA: # 9.13/9.14/9.15 365

Musculoskeletal (MSK) Protocols:

Shoulder/Humerus (with or without Metal): # 4.1/4.2/4.3 370
Elbow/Forearm (without Metal): # 4.6 377
Elbow/Forearm (with Metal): # 4.7 383
Wrist (without Metal): # 4.8 389
Wrist (with Metal): # 4.9 395
Chest Wall/Clavicle/AC Joint/SC Joint/Sternum/Ribs: # 4.13/4.14/4.15 401
Bony Pelvis/Hips/SI/Femur/FAI (without Metal): # 8.1/8.2/8.3 405
Bony Pelvis/Hips/SI/Femur/FAI (with Metal): # 8.4/8.5/8.6 410
Mako Hip: # 8.14 416
Ankle/Foot/Distal Tibia (without Metal): # 9.1 420
Ankle/Foot/Distal Tibia (with Metal): # 9.2 426
Knee/Tibia (without Metal): # 9.3 433
Knee/Tibia (with Metal): # 9.4 437
Mako Knee: # 9.7 442
Femoral Anteversion/Lower Extremity Rotational Study: # 9.8/9.9/9.10 446
Soft Tissue Extremity with IV Contrast: # 9.24/9.25/9.26 450

Pediatric Protocols

Pediatric Chest and Body Protocols:

Chest-Standard (Routine & High Resolution): # 15.1.1/15.2.1/15.4.1/15.6.1/15.8.1.. 453
Peds Chest Dynamic 3D Airway: # 15.1.2/15.2.2/15.4.2/15.6.2/15.8.2..... 458
Chest Pectus: # 15.1.3/15.2.3/15.4.3/15.6.3/15.8.3 464
Chest CTPA for PE: # 15.1.4/15.2.4/15.4.4/15.6.4/15.8.4..... 467
Routine Chest/Abd/Pelvis: # 15.1.5/15.2.5/15.4.5/15.6.5/15.8.5 471
Trauma Chest/Abd/Pelvis: # 15.1.6/15.2.6/15.4.6/15.6.6/15.8.6 476
Routine Abd/Pelvis: # 16.1.1/16.2.1/16.4.1/16.6.1/16.8.1 484
Renal Stone/Flank Pain: # 16.1.1/16.2.1/16.4.1/16.6.1/16.8.1..... 488
Acute Appendicitis - Abd/Pelvis: # 16.1.1/16.2.1/16.4.1/16.6.1/16.8.1 490
CTA ABD - Triphasic Liver: # 16.1.3/16.2.3/16.4.3/16.6.3/16.8.3 492
Trauma Abd/Pelvis: # 16.1.4/16.2.4/16.4.4/16.6.4/16.8.4 498
Pediatric Neck/Chest/Abd/Pelvis..... 503

Pediatric Chest and Body Higher Image Quality (HIQ) Protocols:

Chest-Standard (Routine & Hi-Res) (HIQ): # 15.1.8/15.2.8/15.4.8/15.6.8/15.8.8..... 507
Chest Pectus (HIQ): # 15.1.10/15.2.10/15.4.10/15.6.10/15.8.10 511
Chest CTPA for PE (HIQ): # 15.1.11/15.2.11/15.4.11/15.6.11/15.8.11..... 513
Routine Chest/Abd/Pelvis (HIQ): # 15.1.12/15.2.12/15.4.12/15.6.12/15.8.12 515
Trauma Chest/Abd/Pelvis (HIQ): # 15.1.13/15.2.13/15.4.13/15.6.13/15.8.13 517
Routine Abd/Pelvis (HIQ): # 16.1.6/16.2.6/16.4.6/16.6.6/16.8.6 522
Renal Stone/Flank Pain (HIQ): # 16.1.6/16.2.6/16.4.6/16.6.6/16.8.6 524
Acute Appendicitis - Abd/Pelvis (HIQ): # 16.1.6/16.2.6/16.4.6/16.6.6/16.8.6 526
CTA ABD - Triphasic Liver (HIQ): # 16.1.8/16.2.8/16.4.8/16.6.8/16.8.8..... 527
Trauma Abd/Pelvis (HIQ): # 16.1.9/16.2.9/16.4.9/16.6.9/16.8.9 531
Pediatric Neck/Chest/Abd/Pelvis (HIQ)..... 534

Pediatric Neuroradiology (Neuro) Protocols:

Pediatric Brain - Routine and NAT/Trauma (Helical Mode): # 11.1/11.2/11.3..... 538
Pediatric Brain - Helical Scan with Angled Axial Reformations: # 11.4/11.5/11.6 . 544
Pediatric Brain (Axial Mode): # 11.7/11.8/11.9..... 549
3D CT (Craniosynostosis, Congenital Facial Anomaly): #11.13/11.14/11.15..... 554
Peds Stroke Deluxe - Total Cerebrovascular: # 11.16/11.17/11.18 557
Peds CTA Head Only (Stenosis, Aneurysm, Unknown Bleed): # 11.19/11.20/11.21..... 565
Peds CTA Neck Only (Cerebrovascular Disease): # 11.22/11.23/11.24..... 572
Peds CT Venography Head & Neck: # 11.25/11.26/11.27 577
Stereotactic Head (Whole Brain Treatment Planning): # 11.28/11.29/11.30..... 584
Pediatric Low-Dose Hydrocephalus: # 11.31/11.32 587
Peds Orbit - Routine: # 12.1/12.2/12.3..... 591

Pediatric Neuroradiology (Neuro) Protocols (cont):

Peds Temporal Bone: # 12.4/12.5/12.6 596
Peds Facial Trauma - Routine: # 12.7/12.8/12.9 600
Peds Sinuses - Diagnostic: # 12.10/12.11/12.12 605
DentaScan: # 12.13/12.14/12.15 611
Pediatric Neck - Routine: # 13.1.1/13.4.1/13.8.1 615
Pediatric Cervical Spine: # 13.1.4/13.4.4/13.8.4 621
Pediatric Lumbar Spine: # 17.1.1/17.2.1/17.4.1/17.6.1/17.8.1 627
Pediatric Thoracic Spine: # 17.1.2/17.2.2/17.4.2/17.6.2/17.8.2 634

Pediatric Musculoskeletal (MSK):

Peds Bony Pelvis (without Metal): # 18.1.1/18.2.1/18.4.1/18.6.1/18.8.1 641
Peds Bony Pelvis (with Metal): # 18.1.2/18.2.2/18.4.2/18.6.2/18.8.2 647
Peds Bony Pelvis Low-Dose Spica Casting: # 18.1.3/18.2.3/18.4.3/18.6.3/18.8.3 652

Changes from Revision 6 to Revision 7

As part of our ongoing UW Madison CT protocol optimization, we have made the following changes between our Revision 6 and Revision 7 release. These changes have been internally reviewed and validated by our team of Radiologists, Physicists, and CT Technologists, thereby fulfilling The Joint Commission mandate on protocol review. Detailed documentation of our compliance with The Joint Commission Standards regarding the performance element for CT protocol review is posted on our website (https://uwgect.wiscweb.wisc.edu/).

New Scanners Added

No new scanners were released with the Revision 7 protocol updates. UW protocols currently support the following scanners: Revolution EVO 32ch with ASiR/Optima CT660S; Revolution EVO 64ch with ASiR/Optima CT660; Revolution EVO 64ch with ASiR-V; Revolution Frontier / Revolution Frontier ES / Revolution Discovery CT / Revolution HD / Discovery CT / Discovery CT750 HD; LightSpeed VCT; Optima CT580W; Revolution CT; Revolution CT (without DLIR Purchasable Option); Revolution CT ES; Revolution CT ES (without DLIR Purchasable Option); and Discovery IQ PET/CT.

New Protocols Added

Several new protocols were added to the package this year, including: Salivary Gland in 3 sizes, Dentascan, Abdominal Wall Flap, Thoracic Outlet, and Esophagography. The flowsheet for protocol selection regarding Peds Bony Pelvis has been translated into size-based protocols and we now offer Peds Bony Pelvis without metal, Peds Bony Pelvis with metal and Peds Bony Pelvis for Spica Casting.

For scanners with Dual Energy capability, we have added GSI Gout Spines, GSI Gout Upper and Lower Extremity, as well as a GSI limited-coverage series in the Routine Neck protocol. On the Revolution 256 platform, we also offer 8 GSI Body protocols (only to be used on patients who are under 250 lbs)--Biphasic, Triphasic, Adrenal Gland Adenoma, Pancreas Cancer, Kidney Tumor, Active Bleeder, HCC, and Mesenteric Ischemia.

On the Revolution 256 platform, all Abdominal and Chest section protocols were converted to Auto Prescription.

Protocols Removed

None.

Global Changes Made to the UW Protocols

Auto Prescription was enabled on all of the Abdominal and Chest protocols on the Revolution CT 256 platform. The Auto Prescription profiles were fine tuned to mimic the dose behavior of the UW size-based protocols. Several new UW Auto Prescription and UW GSI profiles have been built.

Pediatric protocols were separated from the Adult protocols. You will find new sections in the protocol manual's Table of Contents titled: Peds Chest and Body, Peds Neuro, Peds CV (only available on certain scanner models), Peds MSK, and Peds High Image Quality. This has allowed the removal of any instructions regarding pediatric patients from the adult protocols, helping to avoid any confusion on contrast volume, injection timing, etc.

The Metal Artifact Reduction Software (MARS) Guidance page has been updated. We no longer recommend using the MAR on bone kernel.

Many of the instructional documents have been updated including our Protocol Quick Guides, Dose Check Manual, and Creatinine Guidelines. We have also reorganized and updated our entire website (https://uwgect.wiscweb.wisc.edu/).

Dose check Notification Values have been set in every protocol to match our Dose Check Manual.

Smart Plan is a new feature on the Revolution 256 platform in which the scanner automatically sets up the start and end location of your scan range based on selected landmarks from your scouts. It is only able to do this if all the anatomy is included in the scout. (The scanner recognizes lung apices, diaphragm, ischial tuberosities, base of skull, etc.) This feature has been enabled on many of the routine scans (i.e., Routine Chest, Routine Abd/Pelvis, Routine Head).

DLIR for GSI was enabled on all UR GSI profiles whenever possible. The same DLIR limitations still apply; i.e., not available on the Primary Recon, only available with the standard kernel, slice thickness must be exactly half, etc.

Abdominal Protocols

All Abdominal protocols have been converted to Auto Prescription on the Revolution CT 256 platform. A set of profiles was developed that were applied to each and every protocol/series/group to deliver the same dose behavior seen in the UW size-based protocols. These Auto prescription profiles are: UW Abd/Pel HIQ (Adult), UW Abd/Pelvis (Adult), UW Large Vessel Body CTA (Adult), UW Liver w/o (Adult), and UW Small Vessel Body CTA (Adult).

Several new GSI profiles were developed to be used on patients who are under 250 lbs. These new GSI body profiles are: GSI TORSO UW PRESET LATE ARTERIAL, GSI TORSO UW PRESET PV, and UW Abdomen Non-Con.

The start location on the Mesenteric Ischemia and Active Bleeder protocols has been adjusted. We now start above the diaphragm on all series instead of above the celiac artery.

The indication section on the Urography and Urothelial Tumor Follow-Up protocols was updated to aid in making the selection decision between the two protocols.

Chest Protocols

A new CT Esophagography protocol was developed to evaluate for esophageal leak or injury.

For convenience, the Hi-Res series was added to the Low-Dose Follow Up Chest protocol.

Cardiovascular (CV) Protocols

A new UWisc Auto Gating profile was created on the Revolution 256 platform. We noticed that there were many instances in which the ideal gating phase was acquired while the scanner was still ramping- up in mA. The UWisc Auto Gating profile has had the gating acquisition windows widened to allow for mA to be at maximum (not ramping up) for a longer period of time.

The Smart-Prep enhancement threshold was increased to 120 HU for all Prospectively - Gated Chest protocols on all scanners. This is to allow greater contrast opacification of the aorta.

UW currently scans our Prospectively Gated Coronary CTA protocol with kV assist. We recommend adjusting the default kV setting to 120 kV for the Prospectively Gated Coronary CTA - medium size only. This is an increase from 100kV on Revision 6 of the protocols.

A CO MIP reformat 10mm x 2.5mm has been included on the Non-Gated CTA Abd/Pel protocol. This is set up to run DMPR.

An additional set of DMPRs has been added to the TAVR protocol. We now run a CO CV and SA CV DMPR.

Per radiologists' requests, we created bilateral 20 DFOV zoomed up recons for each leg (knee down) to better visualize the small vessels of the lower leg.

The guidance for selecting prospective vs retrospective gating has been updated on all scanners. We now recommend:

- <70 bpm with regular heart rate = Prospectively Gated (70%-end diastole)
- >70 bpm with regular heart rate = Prospectively Gated (35%-end systole)
- Irregular heart rate = Retrospectively Gated
- What constitutes an irregular heart rate? Anyone with a heart rate that varies more than 10 beats.

Musculoskeletal (MSK) Protocols

The flowsheet guidance for scanning pediatric MSK bony pelvises has been removed from the documents. There are now 3 different dose-level Peds Bony Pelvis protocols available on all scanners: With Metal, Without Metal and Low-Dose Spica Casting.

HD mode was turned on for Elbow, Wrist, Foot, and Knee protocols to assist with edge enhancement for extremities that are positioned more than 6cm off center. If you have Hi-Res/HD mode, UW recommends turning Hi-Res mode "ON", but using the regular (i.e., non-HD) kernels. HD kernels increase the image noise.

The slice thickness and interval was reduced on the MSK reformats (adult and pediatric) from 3mm x 1.5mm to 2mm x 1mm slices to improve detail. This applies to all MSK protocols except the Bony Pelvis.

The breath hold was enabled on the Routine Shoulder protocols (all sizes, adults and pediatric).

The dose on some of the MSK protocols was reduced. It was found that extremities without metal are best imaged at 100kV with the small focal spot.

Neuroradiology (Neuro) Protocols

Stereotactic Head protocol has been changed to helical acquisition. Stealth scans have historically been performed with axial acquisition, per many Stealth equipment vendor guidelines, but we have found that OR Stealth Equipment is able to read helical scan data. Helical acquisition allows for a faster scan of the patient, with inherently less motion.

All Adult Neck protocols received a slight reduction in dose. The delay in injection protocol went from 30 seconds up to 60 seconds. This longer delay allows greater uptake of contrast in tumors, and allows for better visualization of tumor borders/edges in the soft tissues of the neck. The prep delay for the Adult Neck protocols was also increased from 85 seconds up front to 115 seconds to accommodate for the increase in delay during the multi-phase injection.

The Papillary Thyroid Hypervascular Neck was renamed to Hypervascular Papillary Thyroid. This was done to reduce confusion between the Papillary Thyroid and Parathyroid Adenoma protocols.

Version 6 of the UW CT protocols saw the removal of Cine perfusions, and for scanners without the Shuttle perfusion mode, we have programmed Axial perfusions. For scanners with less than 80mm detector coverage, guidelines have been written to scan two-level perfusions (with two injections) to achieve 80mm of perfusion coverage.

Slight adjustments were made to the smart prep series on the Stroke Deluxe/CTA Head/CTA Neck protocols to decrease venous contamination. The HU threshold went from 50 to 40, and the ISD within the smart prep went from 3 down to 2 seconds. ASiR was increased in the GSI head (or DLIR if applicable) to improve image quality.

A new GSI head profile was created on the Revolution 256 platform. The UW Head NC GSI profile is now mapped to the GSI protocol.

Currently we are recommending a GSI head on any patient that has received IV contrast within the past 8 hours. This is an update from last year's release where a GSI head within 3 hours post contrast was recommended.

Pediatric Protocols

Pediatric CTA Head protocols required an increase in contrast volume. We now give 1.5ml/kg for the CTA series, and .5mL/kg for the Perfusion series, well under the 2.4ml/kg limit recommended by the ACR.

Pediatric Neuro Protocols aged 7-17 years had the contrast delays adjusted to pediatric settings (previously they were set to Adult delay timing).

An adjustment was made to the maximum contrast volume for Pediatric Cardiovascular protocols, the maximum volume was decreased so that a pediatric patient will never receive a greater amount of contrast than an adult. Pediatric maximum contrast volume allowed is less than or equal to any Adult minimum contrast allowed.

The Peds MSK Extremity instructions were updated to include clearer instructions on how to adjust technique when scanning a pediatric extremity, with or without metal.

Peds Neck and C-Spine sizing guidelines were developed to aid in protocol selection. The new guidelines mimic adult protocols and have 3 size bins: Small 10-24 cm, Medium 25-33 cm, and Large 34-45 cm. In order to condense 5 size bins down to 3, slight adjustments were made in dose for all Pediatric Neck and C-Spines.
The Pediatric Chest CTPA for PE primary recon was changed to 1.25mm x .625 mm slices (previously 3.75mm x 2.25mm) to mimic the Adult protocol. The 3.75mm ST recon was removed.

UW Protocol Resource Ecosystem

In addition to the protocols contained in this booklet, we've cultivated a website with additional resources. These resources augment the protocols contained here to assist your practice in all facets of CT scanning. As shown in the graphic below, we have included resources for the following:

https://uwgect.wiscweb.wisc.edu/resources/

- Mapping indications to protocols quick guide
  - We include a manual which is meant to be a quick reference guide for mapping diagnosis and indications to our protocols. We offer various protocols which are required to properly span patient size and the wide range of indications most radiology practices service.

- Accreditation requirements
  - By using the UW protocols you are compliant with a number of Joint Commission Diagnostic Imaging Performance Criteria. Please see the letter on the website which itemizes this.

- Series Description and Hanging Protocols Uniformity
  - We have a vendor neutral manual which details homogeneous name reconstructions and assist tech workflow with image hanging in PACS.

- Quality Assurance
  - We include detailed instructions on Daily, Weekly and Monthly QA testing and analyzing for CT Scanners. These include phantom scanning instructions, data collection worksheets, and step by step instructions on how to scan and gather measurement data for ACR and TJC compliance.

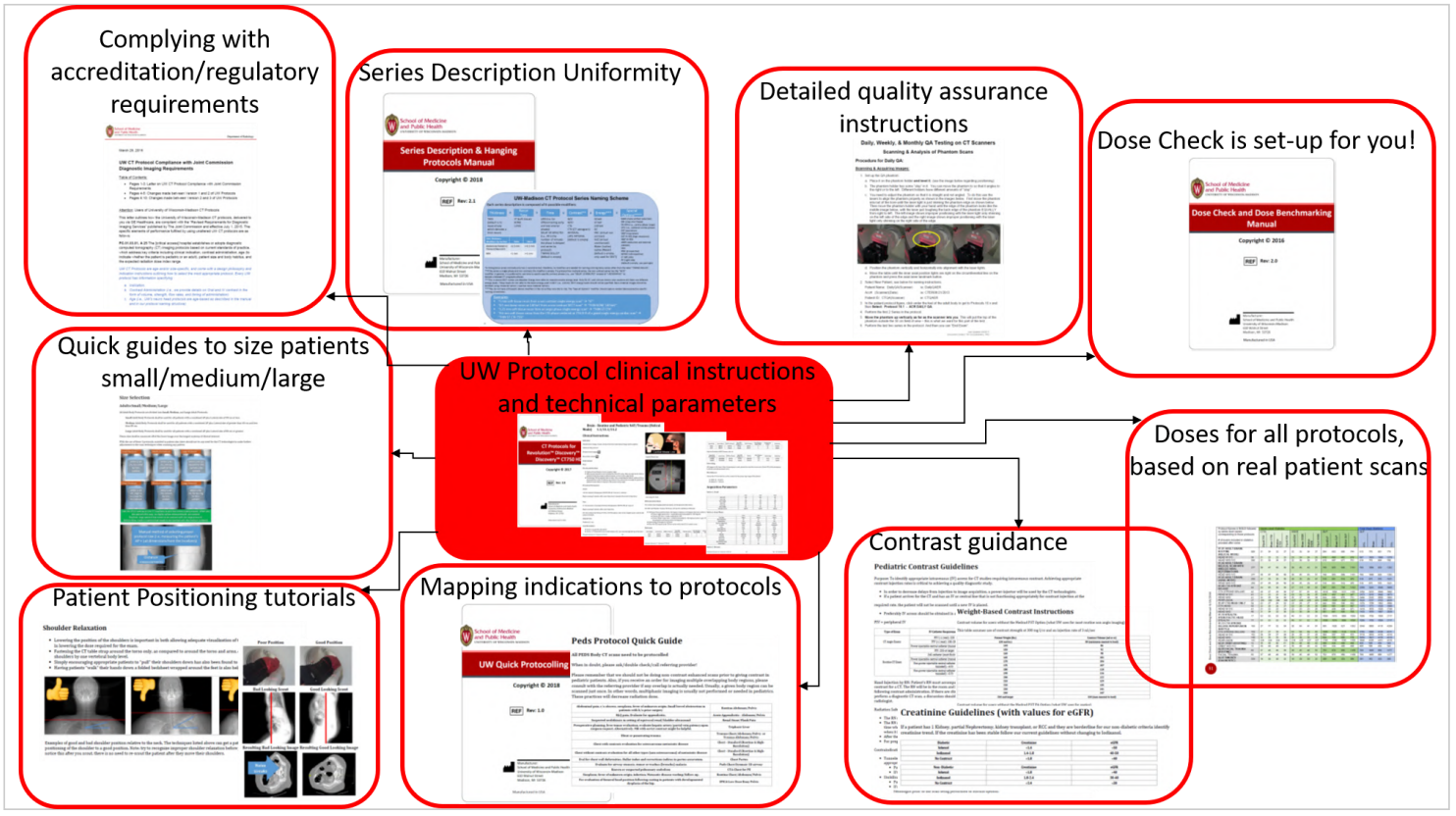
- Dose Check and Dose Benchmarking
  - We provide dose check values tuned to patient size and indication with instructions on how to enter them on your scanner (all UW protocol discs will come with these already pre-loaded for you).
  - We also incorporate dose data from thousands of UW patients scanned using these protocols, providing appropriate standard references.

- Contrast guidance
  - We provide reference material for daily tech use on: needle gauges, creatinine/eGFR levels, weight based dosing, contrast media, and oral contrast mixtures.

- Patient Positioning
  - In proper patient positioning can lead to poor image quality. We have a tutorial document that goes over proper positioning to avoid degradation in spatial resolution and amplifications of image noise.

- Patient Size Selection
  - Many techs at first have trouble with our use of small/medium/large sized based scans. We created a manual and defined our default reconstruction FOV to mitigate any issues.

https://uwgect.wiscweb.wisc.edu/resources/



We hope the collection of scanner protocols contained in this booklet, and the plethora of resources on our website, can aide you in your effort to provide the best patient care possible!

Metal Artifact Reduction (MAR) Guidance

MARS - **M**etal **A**rtifact **R**eduction **S**oftware

UW provides both "with metal" and "without metal" protocols for Neuro and MSK protocols. The "with metal" protocols use a higher dose at 140kV, and enable MAR. We recommend reconstructing non-MAR, as well as MAR images to allow radiologists to better discern MAR induced artifacts.

While MAR is excellent for assessing the soft tissues near metal, it may cause artefactual changes in the hardware or adjacent bone that can mimic hardware fractures and loosening. Due to this issue, our physicians do not interpret the BONE kernel with MAR technique.

General Rule of Thumb

At UW we have slightly different guidelines for MSK and Neuro protocols.

- If your scanner has MARS, we recommend enabling it on the STANDARD/SOFT TISSUE kernel for both Neuro and MSK exams in the presence of metal hardware.

How to Apply MAR

Here is an overview of our current guidance:

	Thin soft tissue recon	Thin bone recon	Thick bone recon	Additional Thin soft tissue with MAR recon	Bone reformats	Soft tissue reformats
T & L Spines	No MAR	No MAR	No MAR	MAR	No MAR	MAR
MSK	No MAR	No MAR	N/A	MAR	No MAR	MAR
Neuro Head/Neck	No MAR	No MAR	No MAR	MAR	No MAR	MAR

Common types of metal that require MAR include: dental illings (amalgam) for head/neck cases, metal hardware for spines/MSK, to be applied to the Soft Tissue recon and reformats

Coverage When Metal is Present

Follow the scan ranges prescribed in the protocol or ordered by the radiologist. You **do not need to cover the entire metal prosthesis** unless ordered by the radiologist for MAR to work. Please just be generous (add a few cm) above and below the area of interest when using MAR.

Compatibility Optima CT660

Introduction:

Listed below are the minimum scanner options required to use this set of protocols on your Optima CT660 scanner. The protocols in this document have been validated on a scanner compatible with the requirements listed below. The portability of UW protocols to scanners with different speci ications may be possible with the proper assistance from your institution's CT protocol optimization team, but should no longer be considered validated UW protocols.

As with any protocol "restore" operation, the existing "user" protocols will be deleted when these UW protocols are loaded onto your scanner. We therefore recommend you keep a copy of any protocols you wish to use after loading the UW protocols, which can then be added to the UW protocol set under your "user" tab.

These protocols were built using software version number 15HW25.2_SP2-0-1. You should contact your service engineer to receive a software upgrade if your current software version is older than this.

IMPORTANT—The following two rules should always be followed when restoring protocols: 1) protocols must only be transferred between scanners of the same model, and 2) protocols must only be transferred from another scanner with a software version that is older or equal in revision number, but not newer.

Scanner Compatibility List:

ASiR

64 slices acquisition at 0.625 mm

Cardiac Options: SmartScore Pro, CardIQ SnapShot, CardIQ SnapShot-Cine

Tube rotation times (helical mode): 0.5, 0.6, 0.7, 0.8, 0.9, and 1.0 second.

mA limits/kV for large focal spot (except pediatric body and pediatric head): 515 mA at 140 kV, 560 mA at 120 kV, 480 mA at 100 kV, and 400 mA at 80 kV

mA limits/kV for small focal spot: 170 mA at 140 kV, 200 mA at 120 kV, 240 mA at 100 kV, and 300 mA at 80 kV

mA limits/kV for pediatric head and pediatric body: 210 mA at 140 kV, 250 mA at 120 kV, 300 mA at 100 kV, and 375 mA at 80 kV

Direct Multi-Planar Reformat (DMPR) Protocols

Introduction:

A Direct Multi-Planar Reformat (DMPR) is a process set up and is executed as part of the scan protocol. It can use the same protocol that might be used in a General Reformat. In DMPR, the user defines the reformat protocols to be executed and sets as an Automated Batch mode or a Manual Batch mode. It is then executed on the ExamRx desktop.

Reformat is available on the Image Works Desktop and requires manual loading of the data once the scan is completed.

DMPR Protocols:

A reformat protocol must be created to be selected for use in protocols with DMPR enabled. For DMPR to work with the UW protocols, reformat protocols will need to be built with the same names as those used in the protocols. To build reformat protocols, you need to select images from an exam already performed to create the initial same-name reformat protocol. Reformat protocols created for use in DMPR must be single-step protocols and can only be created in the axial, sagittal, or coronal viewports. Reformat protocols for use in DMPR need to be saved in the General category if using Volume Viewer. You must create the DMPR reformat protocol on images from the body part that the protocol will be used for (i.e., a Pediatric DMPR protocol must be created on images for a Pediatric case and an Adult DMPR protocol must be created on images for an adult case).

UW-specific DMPR reformat protocol names are identified below with window width and level values for use with UW Protocols:

BODY (use Thin ST) WW/WL 350/50 CO BODY SA BODY 3 X 2	CHEST (use Thin Lung) WW/WL 1500/-700 CO SA 2.5 X 1.25	CARDIOVASCULAR (use Thin ST) WW/WL 450/50 CO CV SA CV 3 X 2
PEDS BODY (use Thin ST) WW/WL 450/50 CO PEDS SA PEDS 4 X 2	PEDS CHEST (use Thin ST) WW/WL 450/50 CO PEDS CHEST SA PEDS CHEST 4 X 2	PEDS CHEST(use Thin Lung) WW/WL 1500/-700 PEDS CO CHEST PEDS SA CHEST 4 X 2

All slice thickness and intervals can be found in the actual protocols.

Manual Reformats (non DMPR, these are for populating the drop down menu in the image works utility):

Optional pre-built reformats: These need to be built manually under Image works; reformat; batch and then protocol drop down menu. (follow the instruction below)

Label	Slice Thickness (mm)	Spacing/Interval (mm)	WW	WL
Head	3	1.5	180	25
MIPS PE	10	5	920	125
MIPS 2x1	2	1	800	200
MIPS 10x2	10	2.5	600	200
CO ST 3X2	3	2	350	50
CO BONE 3x1	3	1.5	2500	350
CO ST 2x1	3	2	450	50
CO BONE 2x1	2	1	2500	350

How to Create a Reformat Protocol for use in a DMPR or manual sessions:

1. Load thin slices (make your reformat 0.625/1.25) into Reformat selected on the Image Works desktop. (You must pick a study that has a wide display field of view and a long scan range, i.e. a run off works well for building these.)
2. Select Batch Reformat.
3. Set the direction (CO/SA) of the batch, slice thickness, interval, FOV, WW/WL and mode to the values for the protocol it will be used with.
4. Define the overage (number of images) for the reformat protocol according to the anatomical area for the protocol.
5. At the bottom of the Batch screen, click ADVANCED.
6. Click SAVE AS PROTOCOL.
7. Enter the Protocol Name* and click OVERWRITE.

*The exact name listed above must be used in the naming of the protocol so DMPR will use the appropriate reformat protocol, which has been predefined in each of the protocols that use DMPR. Once you create these reformat protocols, you will not need to do it again.

Should you decide not to use these suggested reformat protocol names, slice thicknesses, or intervals, you will need to create your own reformat protocols and modify all protocols using DMPR with your selections; otherwise, DMPR will fail to output reformatted series.

To apply Auto DMPR on select recons, click the Auto Apps button. All of your Pre-Set Reformats will then show up in your Batch Protocol List. Click Start New, select the reformats you need for that recon, and click Auto Batch "ON".

Size Selection

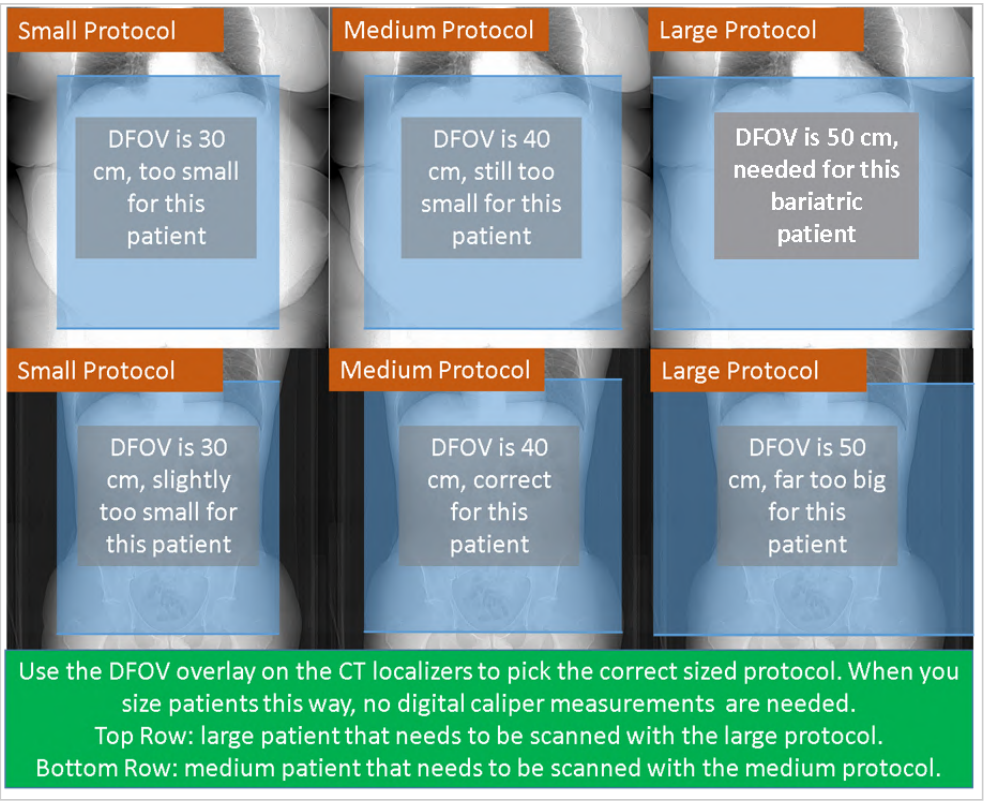
Adults: Small/Medium/Large

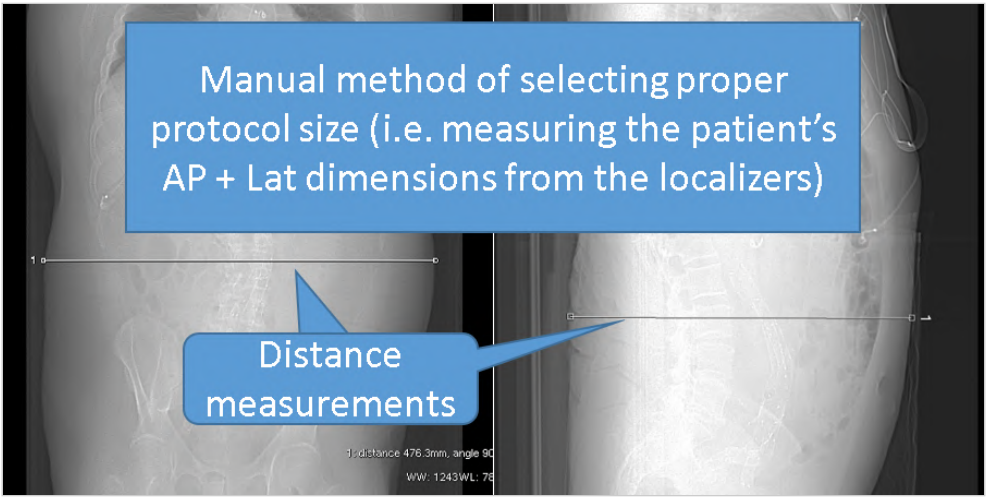
All Adult Body Protocols are divided into **Small**, **Medium**, and **Large** Adult Protocols.

> **Small** Adult Body Protocols shall be used for all patients with a combined AP plus Lateral size of 60 cm or less.
>
> **Medium** Adult Body Protocols shall be used for all patients with a combined AP plus Lateral size of greater than 60 cm and less than 80 cm.
>
> **Large** Adult Body Protocols shall be used for all patients with a combined AP plus Lateral size of 80 cm or greater.

These sizes shall be measured off of the Scout image over the largest anatomy of clinical interest.

With the use of these 3 protocols, matched to patient size, there should not be any need for the CT technologist to make further adjustments to the scan techniques when scanning any patient.





Pediatrics: Color Code

When selecting the patient size protocol to use, the combined AP plus Lateral Size of the patient is the primary determining factor. This sum of the AP plus Lateral dimensions of the patient should be measured off of the scout image over the largest anatomy of clinical interest. For accurate measurement, the patient must be properly centered. Also the window width must be adjusted wide enough so that the measurements can be taken from the surface of the skin. For patients with a combined AP plus Lateral Size above 60 cm, use a Medium Adult protocol.

The pediatric color coding scheme divides pediatric into five sizes coded by color. The approximate age of patients and size ranges are given as follows:

Pink Newborns. Typical AP + Lateral size of 0-26 cm.

Red/Purple 6 months-2.5 years. Typical AP + Lateral size of 27-31 cm.

Yellow/White 3-7 years. Typical AP + Lateral size of 32-37 cm.

Blue/Orange 8-12 years. Typical AP + Lateral size of 38-43 cm.

Green/Black 13-18 years. Typical AP + Lateral size of 44-60 cm.

The 9 colors that are used in this scheme are derived from the Broselow tape scale which was originally used to color code doses of medication given in pediatric care.

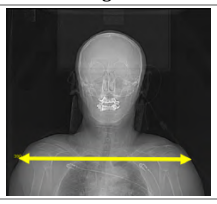
Neuro: Adult/Adolescent/Child/Infant

Some of the Neuro protocols have scan parameters that are divided into 4 groups for: Adult (18+ years old), Adolescent (7-17 years old), Child (3-6 years old), and Infants (0-2 years old). See separate Adult and Pediatric Neck and C -Spine sizing guidelines.

Size Selection for Neck and C-Spine

NOTE - if the patient has lymphoma and the study is a follow-up, use the small neck protocol (regardless of the patients actual size) since it will provide a lower dose

- Verify that the arms are outside of the CT wrap, and that the shoulders are relaxed down toward the feet as far as possible. Measure the width of the shoulders through the level of the mid-humeral head, as shown below.
- Check BMI
- Select small, medium and large based on the table below.

Measure width through mid-humeral heads	Small	Medium	Large
	**Shoulder width less than 46 cm *OR* BMI less than 26**	**Shoulder Width 46 to 50 cm**	**Shoulder width greater than 50 cm *OR* BMI greater than 35**

Trauma Chest and CAP T-Spine Workflow

New Workflow

- You get an order for Trauma Chest only --> you scan the patient using the Trauma Chest protocol
- You get an order for Trauma CAP only --> you scan the patient using the Trauma CAP protocol
- You get an order for a Trauma Chest and T-spine--> You scan the patient with the Trauma chest protocol **AND THEN YOU MUST PERFORM A SEPARATE SCAN USING THE** T-Spine protocol
- You get an order for a Trauma CAP and a T-spine--> You scan the patient with the Trauma CAP protocol (and possible delays) **AND THEN YOU MUST PERFORM A SEPARATE SCAN USING THE** T-Spine protocol

Note: you wont be able to do a retro recon of the T-Spine from the Trauma Chest or Trauma CAP protocol anymore. So make sure the Trauma physician knows if they decide they want T-Spine images at a later time, the patient will have to be re-scanned.

Note: The abdomen portion of the Trauma CAP is still delivered at a spine level dose. In other words, you don't have to perform a separate L-Spine scan if you get an order for Trauma CAP and L-Spine. So if you get an order for a Trauma CAP and T-Spine and L-Spine, you need to scan using just the Trauma CAP and T-Spine protocols.

Note: The pediatric Trauma CAP protocol can still be used to retro recon the T Spine. In other words, you should NEVER scan both a Trauma pediatric CAP and then a T Spine protocol.

Old workflow

All T-spines could be reconstructed from a Trauma Chest or Trauma CAP scan. Therefore, you only had to scan the patient with the Trauma Chest or Trauma CAP protocol.

History of Workflow

Previous versions of UW Protocols scanned Trauma Chest and CAP at a dose level sufficient for T-Spine reconstruction. This allowed a single scan to fulfill orders for both a Trauma Chest and T-Spine. In order to deliver enough dose and minimal artifact for the spines, our technique used a 0.516:1 pitch and relatively long rotation times. This produced good spine images, but the scan times were too long which caused undesired motion on the Trauma chest images.

CT Perfusion Protocol: (Specific Instructions)

Acquisition Parameters

Scan modes for perfusion will vary based on scanner model, scanner options, and perfusion scan range.

What mode to use?

- Is your scanner a Revolution CT, Revolution CT ES, or a Revolution Apex?
  - If yes, use the table labeled "Revolution 256" below which uses a 80 mm collimation and an axial scan mode
    - This scanner doesn't require you to change modes in order to use larger (e.g., 120, 140, or 160 mm) or smaller (e.g., 40 mm) perfusion scan range.
- Does your scanner have shuttle mode?
  - If yes, use a protocol from the section labeled "Shuttle mode capable scanners" which uses an 80 mm shuttle scan range
  - This mode doesn't allow for coverages smaller than 80 mm. If you desire a smaller coverage (e.g., on a pediatric patient) you need to use the instructions below for axial mode. While this mode allows for more than 80 mm of coverage (i.e., the shuttle mode allows up to 120 mm), we recommend 80 mm.
- Does your scanner not have shuttle mode and it is not a Revolution CT, Revolution CT ES, or a Revolution Apex?
  - If yes, use the a protocol from the section labeled "Axial mode perfusion protocols" where we provide parameters for 20 or 40 mm axial mode coverage

You should never use "CINE" mode for perfusion scanning. CINE mode does not allow for gaps between acquisitions. This means the beam is always on, which is not needed for perfusion. Each table below has parameters for both pediatrics (infant/child 0-6 years old) and adults. Adolescents ages 7-17 should use the adult parameters. Apply 30% ASiR/ASiR-V to the perfusion recons if your scanner has that option. **The CTDIvol ranges for the protocols listed here varies between ~200 and ~400 mGy depending on scanner. If you program one of these protocols into your scanner and it provides a CTDIvol over 600 mGy something is wrong.** You should consult GE apps or contact our UW team if this occurs. We use a slightly higher mA for wide bore scanners to account for the larger bore size.

Important: Brain Perfusion scan durations should last for approximately 65 to 70 seconds and have at least 22 passes. In order to achieve this in Axial mode you will adjust several parameters: rotation time, interscan delay, and the number of images. We have included a row for "total number of images" in our Axial Perfusion Mode Parameter Tables. While we understand that "number of images" is not typically a parameter set by technologists, it is an indirect way to get the scanner to scan a specific number of passes. Do not expect to see a box on the scanner telling you your total perfusion scan time for the "Axial mode perfusion protocols". Your total perfusion scan duration for Axial Mode perfusion scanning will be equal to (22 passes at 0.5 seconds) + (22 passes at 2.5 sec ISD) = 66 seconds.

For scanners with limited coverage (i.e., less than 80 mm) you may want to consider preforming multiple perfusion scans with separate contrast injections. Consult a physician at your institution to build such a protocol.

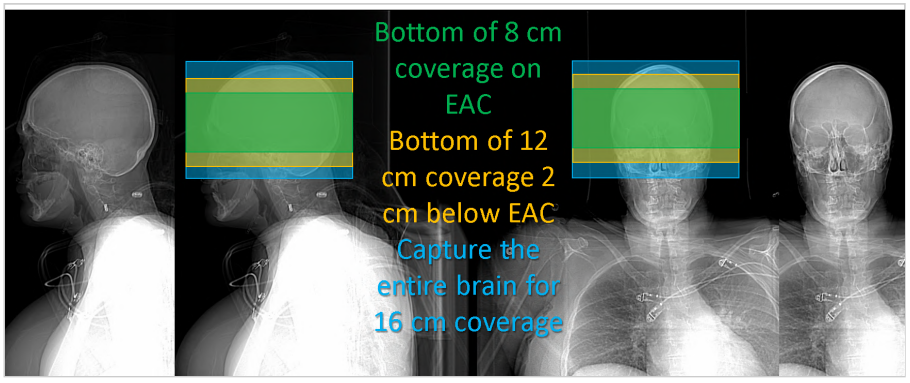
One of the most common errors made in setting up these protocols is entering a non-zero interval for an axial mode perfusion scan. If you do this, the scanner WILL NOT scan the same coverage. A protocol set with a non-zero interval in axial mode will index the couch/table between each perfusion pass --> we do not want this. So please be sure the interval is "0" for axial mode scans. For shuttle mode scans, the interval value will be set by the scanner based on the scan range selection (e.g., for an 80 mm shuttle perfusion the interval is 40 mm).

For pediatrics, UW protocols ship with a default Axial scan range of 40 mm. In many cases 80 mm of coverage is too much for small patients. Therefore, even if the scanner has shuttle mode, for pediatrics we use axial mode in order to obtain a 40 mm collimation. If you require a larger collimation for your pediatric patients, you will have to change to shuttle mode if your scanner has that option. If your scanner doesn't have shuttle mode and you require a collimation larger than 40 mm, you will have to perform two contrast bolus injections and you should consult a physician to discuss. See instructions below for guidance.

	Revolution256	Shuttle mode capable scanners (wide bore)	Shuttle mode capable scanners (regular bore)	Axial mode perfusion protocols (wide bore)	Axial mode perfusion protocols (regular bore)
Scan Type	**Axial**	**Shuttle**	**Shuttle**	**Axial**	**Axial**
Rotation Time	**0.35**	**0.5**	**0.5**	**0.5**	**0.5**
Beam Collimation (mm)	**80**	**40**	**40**	**as large as possible**	**as large as possible**
Detector Rows	**128**	**64**	**64**	**as large as possible**	**as large as possible**
Detector Configuration	**128 x 0.625**	**64 x 0.625**	**64 x 0.625**	**as large as possible**	**as large as possible**
Scan FOV	**Head**	**Head**	**Head**	**Head**	**Head**
Number of images per rotation	**16i**	**8i**	**8i**	**(8i for 40 mm, 4i for 20 mm)**	**(8i for 40 mm, 4i for 20 mm)**
kV	**80**	**80**	**80**	**80**	**80**
Smart or Manual mA	**Manual mA**	**Manual mA**	**Manual mA**	**Manual mA**	**Manual mA**
Manual mA for Adults	**500**	**360**	**300**	**360**	**300**
Manual mA for Ped	**285**	**180**	**150**	**180**	**150**
Duration (sec)	**65**	**65**	**65**	**~65**	**~65**
# of Passes	**22**	**22**	**22**	**22**	**22**
Slice Thickness (mm)	**5.0**	**5.0**	**5.0**	**5.0**	**5.0**
Interval (mm)	**0**	**Determined by scan range**	**Determined by scan range**	**0**	**0**
Total Number of images	You don't need to set this, it is chosen for you when you set up the perfusion protocol.	You don't need to set this, it is chosen for you when you set up the perfusion protocol.	You don't need to set this, it is chosen for you when you set up the perfusion protocol.	This needs to be equal to 22x(beam collimation/5). So for a 20 mm scanner, it will be 88 images. For a 40 mm scanner, it will be 176.	This needs to be equal to 22x(beam collimation/5). So for a 20 mm scanner, it will be 88 images. For a 40 mm scanner, it will be 176.
ISD (interscan delay)	Adjust the field named "Minimum Time Between Passes" until scan time reaches ~65 seconds. For 0.35 second rotation time and 22 passes, this value will be 2.8 seconds.	Not used.	Not used.	2.5 seconds	2.5 seconds

CT Perfusion Coverage

256 (Revolution CT) slice coverage



Perfusion Coverage Guidance. If a "whole brain" coverage is ordered, use the 16 cm coverage. Note, on non Rev256 scanners, you will only have 8 cm of coverage (i.e. shuttle mode). All three protocols will have the same scan time, approximately 60 seconds. 80 mm coverage = 352 images, 120 mm coverage = 528 images and 160 mm coverage = 704 images. Normal stroke workup, even on a 16 cm capable wide axial scanner should only use 80 mm coverage. The >80 mm coverage should be requested specifically by the ordering physician.

80 mm shuttle mode coverage

Obtain 16 contiguous 5 mm slices from EAC Upward

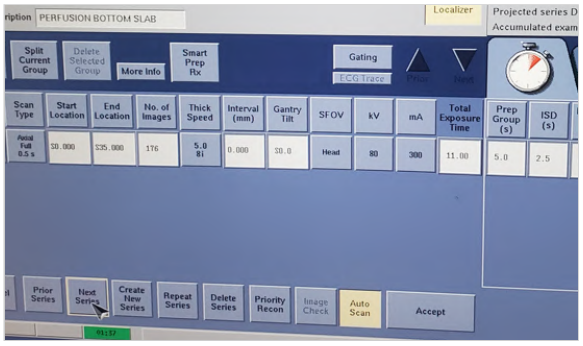
Less than 80 mm coverages

- We do not recommend doing perfusion with scanners having less than 40 mm coverage. Ideally, you should not use a scanner providing less than 80 mm of coverage.

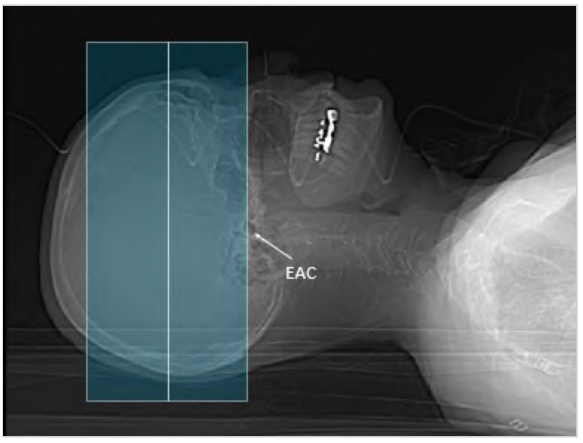
- Coverages for <80 mm should be prescribed by the ordering physician. We provide some example images below of commonly ordered scan ranges.

- UW recommends a two-level CT Brain Perfusion approach for scanners with a max of 40 mm collimation. Due to the limitations of your scanners perfusion coverage, if the radiologist requires more coverage than the 40 mm allowed by the scanner, you will need to load 40 additional mLs of contrast in order to perform two separate injections, five minutes apart, two separate 40mm perfusion coverages with no overlap or gaps.

Scan in two separate series, **we recommend naming each series using "BOTTOM SLAB"/ "TOP SLAB" or explicit coverage description** for differentiation purposes. This is important not only for the radiologists, but also for RAPID AI perfusion post-processing.



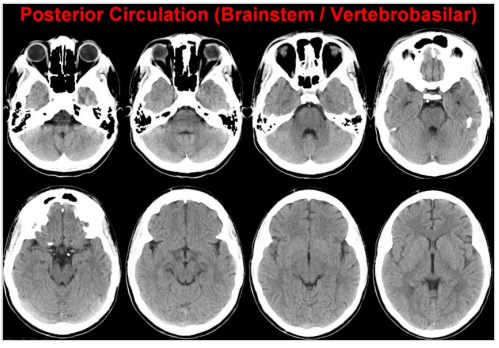
Two level perfusion in two series



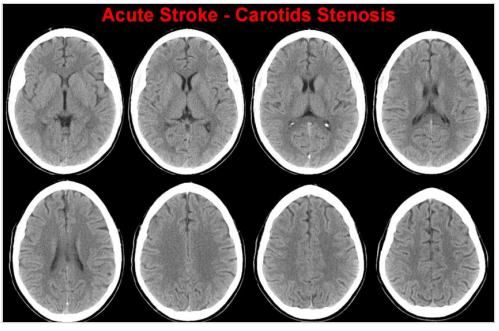
Two level perfusion: Bottom Slab starts at EAC, Top Slab starts at end location of Bottom Slab

- Guidance on how to build/ perform the two-level perfusion protocol:

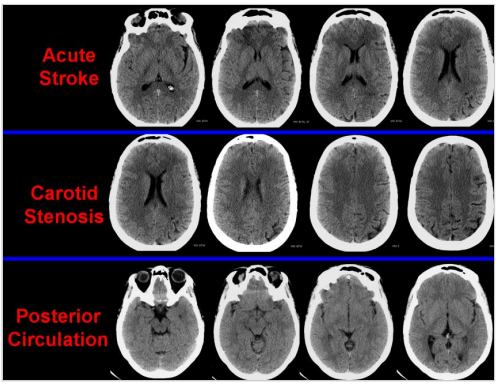
1. Load enough contrast for two perfusion injections plus the CTA injection (usually 200 mL contrast and 200 mL saline)
2. Start scans at EAC, scanning bottom up. You will acquire the Posterior Circulation (Brainstem/Vertebrobasilar) level first with 40 mL of contrast.
3. **Wait 5 minutes**
4. Next series **Start scans at the "END LOCATION" of perfusion 1**, scanning bottom up. You will now acquire the Acute Stroke (Carotid Stenosis) level. Inject AN ADDITIONAL 40 mL of contrast, with the **same timing (5 second prep)** as the first perfusion you just performed. We cannot have an overlap or gap in coverage between the 2 perfusion slabs, so you must enter your start location for the second perfusion group/ series as the end location of your first perfusion group/series.



4 cm coverage for Posterior Circulation (Brainstem/Vertebrobasilar)



4 cm coverage for Acute Stroke (Carotid Stenosis)



We do not recommend doing CT brain perfusions with a 2 cm scanner. However, if you are forced to, this figure shows the scan ranges for common perfusion levels.

Chest/Abd/Pelvis with IV Contrast 5.4/5.5/5.6

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Indication

Evaluate for adenopathy, abscess, and neoplasm.

Oral Contrast

Oral Contrast:

- Patient receives a total volume of 1000mL (1L) of oral contrast. Give a total of 4 doses (800 mL) plus a 2x concentrated (200 mL) dose on the CT scanner.
- 1 Dose = Mix 4mL of Iohexol 300 mg/mL (Omnipaque) in 200mL of clear liquid, no ice, no carbonation.
- Give a total of 4 doses = 800mL (Outpatients: 1 dose every 15 minutes over one hour, Inpatients: 1 dose every 30 mins over two hours).
- Give an additional 2x concentrated dose on the CT scan table. Mix 8mL of Iohexol 300mg/ mL (Omnipaque) in 200mL of clear liquid.

Bariatric Post- Op (Gastric By-Pass) patients:

- These patients are only able to tolerate 150 mL. No need for extended drink duration. Oral contrast ONLY given on the CT scan table just prior to scanning.
- Mix 4mL Iohexol 300 mg/mL (Omnipaque) in 200mL of clear liquid.
- Give 3/4 of 1 dose (150mL of 200mL) on the CT table.

Pre-Scan Instructions

Practice breathing instructions. Ask patient to cough just prior to the scan.

IV Contrast Parameters 350

Select the Ulrich Weight-Based Adult 3mL protocol which will load the following settings: Saline Test Bolus 3mL/sec Weight based volume 3mL/sec (see below) Saline Flush 50 mL 3mL/sec

Iohexol (Omnipaque) 350 mg/mL injection at a rate of 3 mL/sec

For sites without the Ulrich use Medrad p3T or refer to the weight based contrast tables included with the protocol booklet.

IV Contrast Parameters 300/370

Medrad™ P3T Abdomen protocol.

Iohexol (Omnipaque) 300 mg/mL injection at a rate of 3 mL/sec

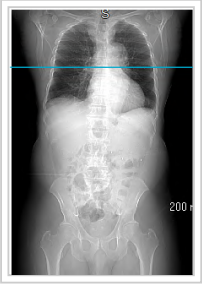
For sites without the Medrad™ P3T or P3T PA option, refer to the weight based contrast tables we provide in the protocol booklet.

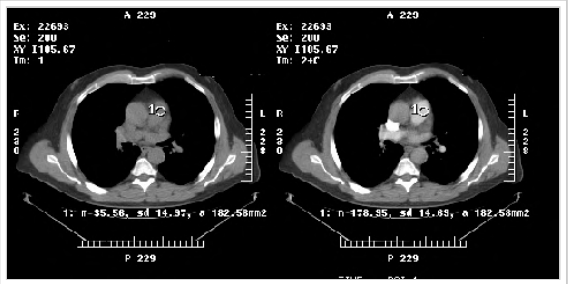
Field of View

Same as previous study or as small as appropriate

Scan Description

- Series 1 - PA and lateral scouts: from lower neck through iliac crest or pubic symphysis
- Series 2 – Helical Scan
  - Scan Phase: 2 groups each with separate inspiration breath hold.
    - 1st group - Chest: Start scan above lung apices (first rib) and scan through lung bases/costophrenic angles.
    - 2nd group - Abd/Pel: Scanned at 70 seconds from the start of the injection. Adjust Prep Delay to achieve this. Start scan just above the diaphragm, end just below pubic symphysis. If no pelvis is ordered/ indicated, end scan at iliac crests.
  - Smart Prep- Monitor Phase: Center over pulmonary artery, threshold 100 HU. No greater than a 50 second delay.





Reformat Instructions

Use DMPR on THIN ST.

Reformats

Name	Source Series Name	DMPR or Manual		Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
SA	THIN LUNG	non-Rev256: DMPR (Chest)	Rev256: Manual (Chest)	Average	1500/-700	2.5	1.25	sagittal
CO	THIN LUNG	non-Rev256: DMPR (Chest)	Rev256: Manual (Chest)	Average	1500/-700	2.5	1.25	coronal
Axial MIP	THIN ST	Manual		MIP	1500/-700	10	5	AX MIPS
SA BODY	THIN ST	DMPR (Abd/Pelvis)		Average	350/50	3	2	sagittal
CO BODY	THIN ST	DMPR (Abd/Pelvis)		Average	350/50	3	2	coronal

Networking

- Chest scan send all series to PACS (ALI_Store) including the Dose Information Slide.
- All body images are networked to PACS (ALI_Store).
- Note: if smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

Miscellaneous

For Chest/Abd/Pelvis SPLIT CASES please refer to the Chest Protocol and the A/P protocol for Reformats

Acquisition Parameters

Series 1, Scout

	Small	Medium	Large
Scout 1 kV	**100**	**120**	**140**
Scout 1 mA	**10**	**10**	**10**
Scout 1 Angle	**180**	**180**	**180**
Scout 2 kV	**100**	**120**	**140**
Scout 2 mA	**40**	**40**	**80**
Scout 2 Angle	**90**	**90**	**90**
WW/WL for Scout	**500/50**	**500/50**	**500/50**

Series 2, Smart Prep

	Small	Medium	Large
mA	**40**	**40**	**40**
Monitoring Delay (sec)	**15**	**15**	**15**
Monitoring ISD (sec)	**3**	**3**	**3**
Enhancement Threshold (HU)	**100**	**100**	**100**
Diagnostic Delay	**Auto Minimum**	**Auto Minimum**	**Auto Minimum**

Series 2, Group 1, Scan Phase

	Small	Medium	Large
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**40**	**40**	**40**
Detector Rows	**64.0**	**64.0**	**64.0**
Detector Configuration	**64x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Large Body**	**Large Body**	**Large Body**
Pitch	**1.375**	**1.375**	**1.375**
Speed (mm/rot)	**55.00**	**55.00**	**55.00**
Rotation Time (s)	**0.6**	**0.7**	**0.9**
kV	**100**	**120**	**140**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(35-420)**	**(35-540)**	**(25-490)**
Manual mA	**260.0**	**270.0**	**280.0**
Noise Index	**16.5**	**18.5**	**24.0**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.5**	**2.5**	**2.5**

Series 2, Group 1, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option			
ASiR/ASiR256/DLIR	**30% / 20% / Medium**	**30% / 20% / Medium**	**30% / 20% / Medium**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.5**	**2.5**	**2.5**
Recon 2 (Secondary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**30% / 20% / Medium**	**30% / 20% / Medium**	**30% / 20% / Medium**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**
Recon 3 (Secondary)			
DFOV	**30**	**40**	**50**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**1500/-700**	**1500/-700**	**1500/-700**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**	**None**	**None**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Series 2, Group 2, Scan Phase

	Small	Medium	Large
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**40**	**40**	**40**
Detector Rows	**64.0**	**64.0**	**64.0**
Detector Configuration	**64x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Large Body**	**Large Body**	**Large Body**
Pitch	**0.516**	**0.516**	**0.516**
Speed (mm/rot)	**20.60**	**20.60**	**20.60**
Rotation Time (s)	**0.5**	**0.5**	**0.6**
kV	**100**	**120**	**140**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(40-320)**	**(50-480)**	**(40-470)**
Manual mA	**200.0**	**240.0**	**270.0**
Noise Index	**14.0**	**16.0**	**20.5**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.5**	**2.5**	**2.5**

Series 2, Group 2, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**350/50**	**350/50**	**350/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option			
ASiR/ASiR256/DLIR	**40% / 20% / Low**	**40% / 20% / Low**	**40% / 20% / Low**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.5**	**2.5**	**2.5**
Recon 2 (Secondary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**350/50**	**350/50**	**350/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**40% / 20% / Low**	**40% / 20% / Low**	**40% / 20% / Low**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Chest/Abd/Pelvis without IV Contrast 5.7/5.8/5.9

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Indication

Evaluate for adenopathy, abscess, and neoplasm.

Oral Contrast

Oral Contrast:

- Patient receives a total volume of 1000mL (1L) of oral contrast. Give a total of 4 doses (800 mL) plus a 2x concentrated (200 mL) dose on the CT scanner.
- 1 Dose = Mix 4mL of Iohexol 300 mg/mL (Omnipaque) in 200mL of clear liquid, no ice, no carbonation.
- Give a total of 4 doses = 800mL (Outpatients: 1 dose every 15 minutes over one hour, Inpatients: 1 dose every 30 mins over two hours).
- Give an additional 2x concentrated dose on the CT scan table. Mix 8mL of Iohexol 300mg/ mL (Omnipaque) in 200mL of clear liquid.

Bariatric Post- Op (Gastric By-Pass) patients:

- These patients are only able to tolerate 150 mL. No need for extended drink duration. Oral contrast ONLY given on the CT scan table just prior to scanning.
- Mix 4mL Iohexol 300 mg/mL (Omnipaque) in 200mL of clear liquid.
- Give 3/4 of 1 dose (150mL of 200mL) on the CT table.

Pre-Scan Instructions

Practice breathing instructions. Ask patient to cough just prior to the scan.

IV Contrast Parameters

None

Field of View

Same as previous study or as small as appropriate

Scan Description

- Series 1 - PA and lateral scouts: from lower neck through iliac crest (for chest/abdomen) or pubic symphysis (for CAP)
- Series 2 – 2 groups each with separate inspiration breath hold.
    -
    - 1st group- Chest: Start scan above lung apices (first rib) and scan through lung bases/costophrenic angles.
    - 2nd group- Abd/Pel: Overlap 1st group 2 cm, and end scan just below pubic symphysis. If no pelvis is ordered/ indicated, end scan at iliac crests.

Reformat Instructions

Use DMPR on THIN ST.

Reformats

Name	Source Series Name	DMPR or Manual		Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
SA	THIN LUNG	non-Rev256: DMPR (Chest)	Rev256: Manual (Chest)	Average	1500/-700	2.5	1.25	sagittal
CO	THIN LUNG	non-Rev256: DMPR (Chest)	Rev256: Manual (Chest)	Average	1500/-700	2.5	1.25	coronal
Axial MIP	THIN ST	Manual		MIP	1500/-700	10	5	AX MIPS
SA BODY	THIN ST	DMPR (Abd/Pelvis)		Average	350/50	3	2	sagittal
CO BODY	THIN ST	DMPR (Abd/Pelvis)		Average	350/50	3	2	coronal

Networking

- Chest scan send all series to PACS (ALI_Store) including the Dose Information Slide.
- All body images are networked to PACS (ALI_Store).
- Note: if smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

Miscellaneous

For Chest/Abd/Pelvis SPLIT CASES please refer to the Chest Protocol and the A/P protocol for Reformats

Acquisition Parameters

Series 1, Scout

	Small	Medium	Large
Scout 1 kV	100	120	140
Scout 1 mA	10	10	10
Scout 1 Angle	180	180	180
Scout 2 kV	100	120	140
Scout 2 mA	40	40	80
Scout 2 Angle	90	90	90
WW/WL for Scout	500/50	500/50	500/50

Series 2, Group 1, Scan Phase

	Small	Medium	Large
Scan Type	Helical	Helical	Helical
Beam Collimation	40	40	40
Detector Rows	64.0	64.0	64.0
Detector Configuration	64x0.625	64x0.625	64x0.625
Scan FOV	Large Body	Large Body	Large Body
Pitch	1.375	1.375	1.375
Speed (mm/rot)	55.00	55.00	55.00
Rotation Time (s)	0.6	0.7	0.9
kV	100	120	140
AEC type	smart mA	smart mA	smart mA
mA Range	(35-420)	(35-540)	(25-490)
Manual mA	260.0	270.0	280.0
Noise Index	16.5	18.5	24.0
Slice Thickness (mm)	3.75	3.75	3.75
Interval (mm)	2.5	2.5	2.5

Series 2, Group 1, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option			
ASiR/ASiR256/DLIR	**30% / 20% / Medium**	**30% / 20% / Medium**	**30% / 20% / Medium**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.5**	**2.5**	**2.5**
Recon 2 (Secondary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**30% / 20% / Medium**	**30% / 20% / Medium**	**30% / 20% / Medium**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**
Recon 3 (Secondary)			
DFOV	**30**	**40**	**50**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**1500/-700**	**1500/-700**	**1500/-700**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**	**None**	**None**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Series 2, Group 2, Scan Phase

	Small	Medium	Large
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**40**	**40**	**40**
Detector Rows	**64.0**	**64.0**	**64.0**
Detector Configuration	**64x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Large Body**	**Large Body**	**Large Body**
Pitch	**0.516**	**0.516**	**0.516**
Speed (mm/rot)	**20.60**	**20.60**	**20.60**
Rotation Time (s)	**0.5**	**0.5**	**0.6**
kV	**100**	**120**	**140**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(40-320)**	**(50-480)**	**(40-470)**
Manual mA	**200.0**	**240.0**	**270.0**
Noise Index	**14.0**	**16.0**	**20.5**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.5**	**2.5**	**2.5**

Series 2, Group 2, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**350/50**	**350/50**	**350/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option			
ASiR/ASiR256/DLIR	**40% / 20% / Low**	**40% / 20% / Low**	**40% / 20% / Low**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.5**	**2.5**	**2.5**
Recon 2 (Secondary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**350/50**	**350/50**	**350/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**40% / 20% / Low**	**40% / 20% / Low**	**40% / 20% / Low**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

CTPA for PE with Abd/Pelvis 5.19/5.20/5.21

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Indication

Combination Protocol

CTA PE Chest

Evaluate for known or suspected pulmonary embolism.

Video for this protocol

Routine Abdomen Pelvis

Evaluate for abdominal pathology other than hypervascular tumors.

Video for this protocol

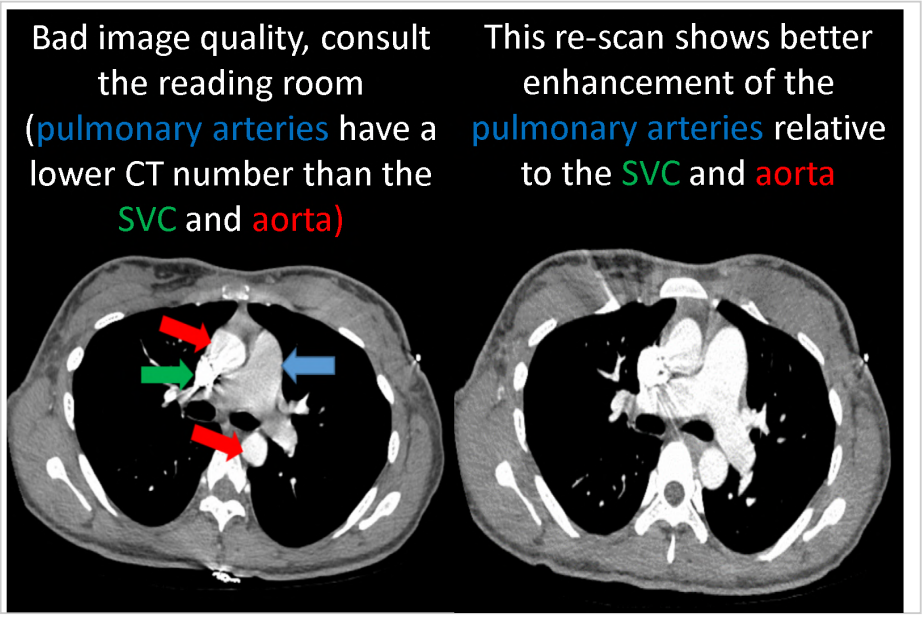
Oral Contrast

None

Pre-Scan Instructions

Practice the 3 breaths for scouts, smart prep, and the actual helical scan, we do not want to induce a transient interruption of contrast (TIC) which would can mimic a PE and or produce an indeterminate exam. Please give the patient these EXACT instructions: **"When you take your last breath before the exam, take a full breath but gently hold. Do not bear down, tense up, or strenuously hold your breath. This exam will be over in about 4 seconds from when we tell you hold your breath to when you may breath again.**

We would like to visualize contrast in the pulmonary arteries and aorta because this is a double rule out protocol. If you see the contrast in the pulmonary arteries at a much lower intensity than the SVC and aorta, the patient likely had a TIC which kept the PA from enhancing correctly. This is not a scan timing issue, but an issue with un-opacified blood entering the heart faster from the IVC than opacified blood from the SVC caused by a pressure imbalance between the thorax and abdomen. This is why the breathing instructions we provide above are critical for this exam. As a guidance tool, a good PE exam will have an enhancement threshold of 300 HU.



If your exam looks like the one shown here on the left, please call the reading room and have them review the images before letting the patient leave the CT suite.

Ventilated patients will be scanned on inspiration to ensure safety of RT Staff.

Clamp Foley catheter prior to scanning. Make sure to place Foley below the level of the bladder.

IV Contrast Parameters 350

Ulrich Protocols 31-33

Weight Ranges	Contrast Dosage	Injection Rate
<164 lbs. (<74 kg)	86 mL Iohexol 350 mgI/mL MINIMUM	5 mL/sec
164 -250 lbs. (74-113 kg)	Weight based Routine Adult Iohexol 350 mgI/mL	5 mL/sec
250-300 lbs. (113-160 kg)	132 mL Iohexol 350 mgI/mL + 10 mL NaCl flush	5 mL/sec
>300 lbs (>160 kg)	159 mL Iohexol 350 mgI/mL + 10 mL NaCl flush	5 mL/sec
18 G Antecubital IV Started in the Right Arm		

IV Contrast Parameters 300/370

Weight Ranges	Contrast Dosage	Injection Rate
<250 lbs. (<113 kg)	Use P3T, Iohexol 300 mgI/mL DO NOT USE LESS THAN 100 mLs	5 mL/sec
250-300 lbs. (113-140 kg)	150 mL Iohexol 300 mgI/mL + 10 mL NaCl flush	5 mL/sec
300-350 lbs. (140-160 kg)	125 mL Iopamidol 370 mgI/mL (Isovue) + 10 mL NaCl flush	5 mL/sec
>350 lbs (>160 kg)	150 mL Iopamidol 370 mgI/mL (Isovue) + 10 mL NaCl flush	5 mL/sec
18 G Antecubital IV Started in the Right Arm		

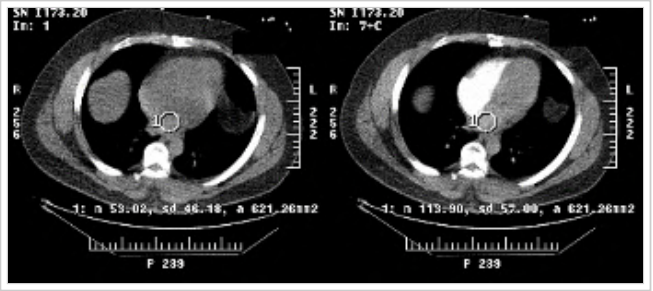
Field of View

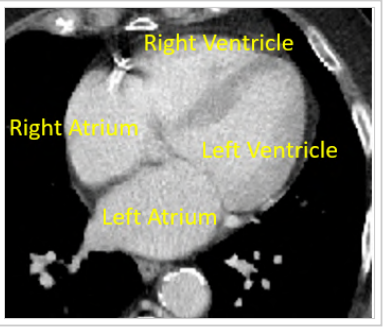
Smallest possible to include all of chest including axillae and breasts.

Scan Description

- Series 1 - PA and lateral scouts: from lower neck through iliac crest or pubic symphysis using the suspension breathing instructions
- Series 2
  - Group 1 CTA PE

    - Scan Phase: from lower neck to diaphragm with IV Contrast. Inspiratory breathing instructions are on, remind the patient not to bear down or strain.
- Group 2 Abdomen Pelvis
    - Scan Delay - Set to scan 70 seconds after contrast injection
    - Scan Phase: Start scan at the top of the diaphragm, for Abdomen Only end at the iliac crests or for Abdomen/Pelvis end at pubic symphysis.
    - Smart Prep - Monitor Phase: Center on Lt atrium; Watch for atrial filling with contrast on the bolus tracking scan and then start using manual start, no delay is needed.



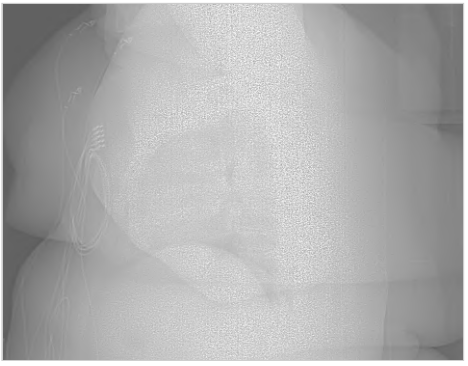


Adjustments for Bariatric PE and Cardiac Studies We do not have a bariatric protocol for chest PE or cardiac (retrospectively or prospectively gated coronaries) studies. Our large protocol is already designed to deliver a higher maximum dose than the medium and small adult protocols, but it uses 120 kV to maximize iodine contrast. Other large adult protocols that are not angiograms use 140 kV for large adults. Therefore, for bariatric patients who 1. **fill the scout view** or 2. **max out the mA table** please increase the kV from 120 kV to 140 kV.

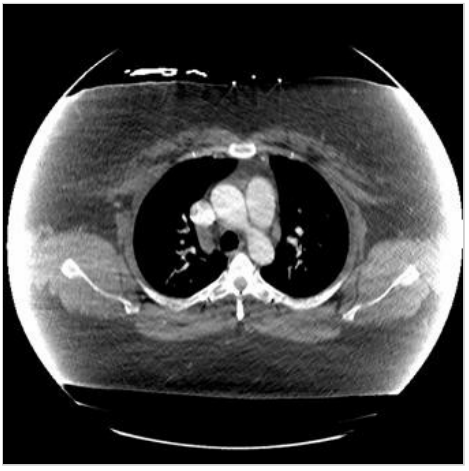
Note: If you know the patient is likely to max out the mA table before taking the scout, you should increase the scout kV from 120 to 140.

Example of a patient **filling the scout view**

Example patient **filling the scout AP view**



Example patient **filling the scout lateral view**



resulting poor image quality from a patient who **fills the scout**

Reformat Instructions

In the United States, CT Angiography CPT codes require the performance and documentation of 3D angiographic rendering, which may include maximum intensity projection (MIP), volumetric rendering, and/or surface rendering techniques.

Reformats

For PE

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
SA	THIN LUNG	DMPR	Average	1500/-700	2.5	1.25	sagittal Include the spine and sternum.
CO	THIN LUNG	DMPR	Average	1500/-700	2.5	1.25	coronal Include the spine and sternum.
MIPS	THIN ST	Manual	MIP	920/125	10	5	Axial

For Abdomen Pelvis

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
SA BODY	THIN ST	DMPR	Average	350/50	3	2	sagittal
CO BODY	THIN ST	DMPR	Average	350/50	3	2	coronal

Networking

- Chest scan send all series to PACS (ALI_Store) including the Dose Information Slide.
- All body images are networked to PACS (ALI_Store).
- Note: if smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

Miscellaneous

- Ventilated patients will be scanned on inspiration to allow respiratory therapists to be outside of the scan room during the scan.
- DO NOT USE VISIPAQUE UNLESS INSTRUCTED BY THE RADIOLOGIST

Acquisition Parameters

Series 1, Scout

	Small	Medium	Large
Scout 1 kV	100	120	140
Scout 1 mA	10	10	20
Scout 1 Angle	180	180	180
Scout 2 kV	100	120	140
Scout 2 mA	40	40	40
Scout 2 Angle	90	90	90
WW/WL for Scout	500/50	500/50	500/50

Series 2, Group 1, Smart Prep

	Small	Medium	Large
mA	40	40	40
Monitoring Delay (sec)	2.0	2.0	2.0
Monitoring ISD (sec)	1.0	1.0	1.0
Enhancement Threshold (HU)	60	60	60
Diagnostic Delay	Auto Minimum	Auto Minimum	Auto Minimum

Series 2, Group 1, Scan Phase

	Small	Medium	Large
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**40**	**40**	**40**
Detector Rows	**64.0**	**64.0**	**64.0**
Detector Configuration	**64x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Large Body**	**Large Body**	**Large Body**
Pitch	**1.375**	**1.375**	**1.375**
Speed (mm/rot)	**55.00**	**55.00**	**55.00**
Rotation Time (s)	**0.5**	**0.7**	**0.8**
kV	**100**	**100**	**120**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(35-450)**	**(30-480)**	**(35-560)**
Manual mA	**230.0**	**250.0**	**380.0**
Noise Index	**30.0**	**46.0**	**50.0**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Series 2, Group 1, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**30% / 20% / Medium**	**30% / 20% / Medium**	**30% / 20% / Medium**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**
Recon 2 (Secondary)			
DFOV	**30**	**40**	**50**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**1500/-700**	**1500/-700**	**1500/-700**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**	**None**	**None**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Series 2, Group 2, Scan Phase

	Small	Medium	Large
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**40**	**40**	**40**
Detector Rows	**64.0**	**64.0**	**64.0**
Detector Configuration	**64x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Large Body**	**Large Body**	**Large Body**
Pitch	**0.516**	**0.516**	**0.516**
Speed (mm/rot)	**20.60**	**20.60**	**20.60**
Rotation Time (s)	**0.5**	**0.5**	**0.6**
kV	**100**	**120**	**140**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(40-320)**	**(50-480)**	**(40-470)**
Manual mA	**200.0**	**240.0**	**270.0**
Noise Index	**14.0**	**16.0**	**20.5**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.5**	**2.5**	**2.5**

Series 2, Group 2, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**350/50**	**350/50**	**350/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option			
ASiR/ASiR256/DLIR	**40% / 20% / Low**	**40% / 20% / Low**	**40% / 20% / Low**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.5**	**2.5**	**2.5**
Recon 2 (Secondary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**350/50**	**350/50**	**350/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**40% / 20% / Low**	**40% / 20% / Low**	**40% / 20% / Low**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Trauma - Chest 5.22/5.23/5.24

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Indication

Emergency evaluation for aortic injury or organ disruption. Routine creatinine cut-off for IV contrast administration does not apply in a trauma.

Video for this protocol

Oral Contrast

None

Pre-Scan Instructions

None

IV Contrast Parameters 350

Select the Ulrich Weight-Based Adult 4mL protocol which will load the following settings: Saline Test Bolus 4mL/sec Weight based volume 4mL/sec (see below) Saline Flush 30 mL at a rate of 4mL/sec

Iohexol (Omnipaque) 350 mg/mL injection at a rate of 4 mL/sec

For sites without the Ulrich use Medrad p3T or refer to the weight-based contrast tables included with the protocol booklet.

IV Contrast Parameters300/370

Medrad™ P3T Abdomen

4 mL/sec Iohexol (Omnipaque) 300 mg/mL injection

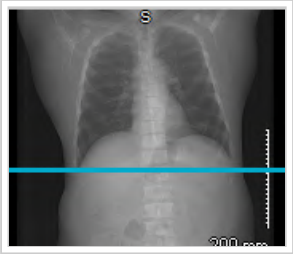
For sites without the Medrad™ P3T or P3T PA option, refer to the weight based contrast tables we provide in the protocol booklet.

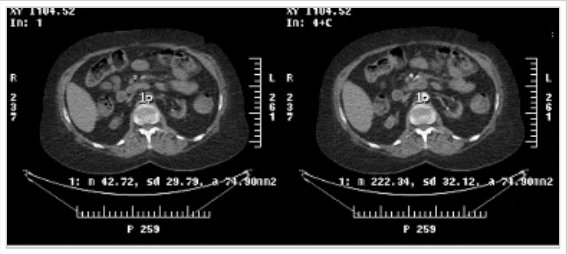
Field of View

Same as previous study or as small as appropriate

Scan Description

- Series 1 - PA & lateral scout: from lower neck to mid-abdomen.
- Series 2 - Helical Scan- Scan Phase- With IV Contrast: Scanned bottom-up. Start scan mid L2 (*be sure to cover the spleen and entire rib cage*) and end at the top of the lungs (apices). The scan should be performed at full inspiration. Intubated patients should have their breathing suspended by respiratory therapy, whenever possible.
    - Smart Prep- Monitor Phase: Center over the liver. Put ROI in the aorta. **Dynamic transition is turned on so the scan will progress without the need for you to hit 'scan phase'.**





Reformat Instructions

Perform a manual reformat for the axial MIP. The CO and SA reformats are set-up for DMPR.

Reformats

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
MIPS	THIN ST	Manual	MIP	1500/-700	10	5	axial
SA	THIN LUNG	DMPR	Average	1500/-700	2.5	1.25	sagittal Include the spine and sternum.
CO	THIN LUNG	DMPR	Average	1500/-700	2.5	1.25	coronal Include the spine and sternum.

Networking

- All Images to PACS (ALI_Store).
- Note: if smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

Miscellaneous

None

Acquisition Parameters

Series 1, Scout

	Small	Medium	Large
Scout 1 kV	100	120	140
Scout 1 mA	10	10	10
Scout 1 Angle	180	180	180
Scout 2 kV	100	120	140
Scout 2 mA	40	40	80
Scout 2 Angle	90	90	90
WW/WL for Scout	500/50	500/50	500/50

Series 2, Smart Prep

	Small	Medium	Large
mA	40	40	40
Monitoring Delay (sec)	15	15	15
Monitoring ISD (sec)	3	3	3
Enhancement Threshold (HU)	100	100	100
Diagnostic Delay	Auto Minimum	Auto Minimum	Auto Minimum

Series 2, Scan Phase

	Small	Medium	Large
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**40**	**40**	**40**
Detector Rows	**64.0**	**64.0**	**64.0**
Detector Configuration	**64x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Large Body**	**Large Body**	**Large Body**
Pitch	**1.375**	**1.375**	**1.375**
Speed (mm/rot)	**55.00**	**55.00**	**55.00**
Rotation Time (s)	**0.6**	**0.7**	**0.9**
kV	**100**	**120**	**140**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(35-420)**	**(35-540)**	**(25-490)**
Manual mA	**260.0**	**270.0**	**280.0**
Noise Index	**16.5**	**18.5**	**24.0**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.5**	**2.5**	**2.5**

Series 2, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option			
ASiR/ASiR256/DLIR	**30% / 20% / Medium**	**30% / 20% / Medium**	**30% / 20% / Medium**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.5**	**2.5**	**2.5**
Recon 2 (Secondary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**30% / 20% / Medium**	**30% / 20% / Medium**	**30% / 20% / Medium**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**
Recon 3 (Secondary)			
DFOV	**30**	**40**	**50**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**1500/-700**	**1500/-700**	**1500/-700**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**	**None**	**None**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Trauma - Chest/Abd/Pelvis 5.25/5.26/5.27

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Indication

Emergency evaluation for aortic injury or organ disruption. Routine creatinine cut-off for IV contrast administration does not apply in a trauma.

Video for this protocol

Oral Contrast

None

Pre-Scan Instructions

Patients with a Foley catheter must have it clamped prior to scanning. Make sure to place Foley below the level of the bladder.

IV Contrast Parameters 350

Select the Ulrich Weight-Based Adult 4mL protocol which will load the following settings: Saline Test Bolus 4mL/sec Weight based volume 4mL/sec (see below) Saline Flush 30 mL at a rate of 4mL/sec

Iohexol (Omnipaque) 350 mg/mL injection at a rate of 4 mL/sec

For sites without the Ulrich use Medrad p3T or refer to the weight-based contrast tables included with the protocol booklet.

IV Contrast Parameters 300/370

Medrad™ P3T Abdomen

4 mL/sec Iohexol (Omnipaque) 300 mg/mL injection

For sites without the Medrad™ P3T or P3T PA option, refer to the weight based contrast tables we provide in the protocol booklet.

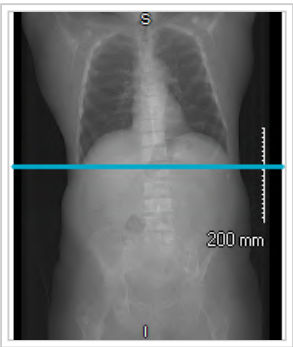
Field of View

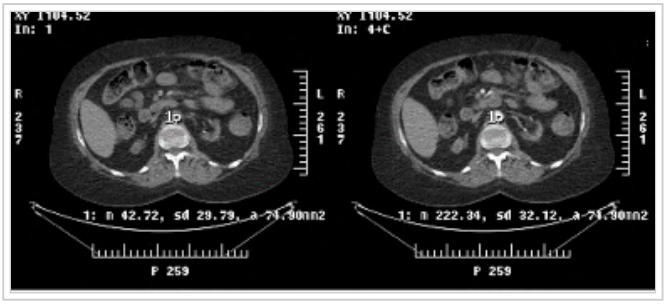
Same as previous study or as small as appropriate

Scan Description

- **Series 1**- PA & lateral scout: from mid-neck through iliac crests or pubic symphysis.
- **Series 2** – Helical Scan- Scan Phase: With IV Contrast scans – Performed in 2 groups: Chest (1st group) – Abdomen and Pelvis (2nd group)
  - 1st group: Scanned bottom-up. Start scan mid L2 (*be sure to cover the spleen*) and scan to the top of the lungs (apex)
  - 2nd group: Scanned at 70 seconds from the start of the injection. Adjust Prep Group delay to achieve this, for Abdomen/Pelvis end at pubic symphysis

- Smart Prep- Monitor Phase: Center over the liver. Put ROI in the aorta. **Dynamic transition is turned on so the scan will progress without the need for you to hit 'scan phase'.**





- **Series 3** - Delayed Scan (Optional per MD)
  - 7 minute delayed scans from the top of the kidneys through the bladder base

Reformat Instructions

The axial MIPs of the chest are manual and the L-spines (if ordered) are manual. The rest of the reformats for the chest and abdomen/pelvis use DMPR.

Extra Recons on Trauma Protocols:

- In Trauma patients, we Retro Recon our L-spines from the Trauma Abd/Pel protocol. We no longer retro T spines off the Trauma Chest as mentioned in the revisions. If a T-Spine is ordered, you will need to perform a dedicated T-Spine scan.
- Trauma Abd/Pelvis or Trauma Chest/Abd/Pelvis recons occupy the first 2 and 3 recons respectively. The subsequent 3 recons are pre-set for L spine scan parameters. You can turn these on if you have an order to recon the spine for the patient.
  - Remember once you turn these recons on you must adjust the FOV, start and end location, R/L centering, and A/P centering.
  - Remember to turn off these additional recons if you have to add a group to the end of your scan (get through the pelvis), or it will add that small group to the end of your L-spine.

Use Exam Split or Anonymize exam to separate the Lumbar Spine from the Trauma C/A/P or Trauma A/P.

Reformats

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
MIPS	THIN ST	Manual	MIP	1500/-700	10	5	axial
SA	LUNG	DMPR	Average	1500/-700	2.5	1.25	sagittal Include the spine and sternum.
CO	LUNG	DMPR	Average	1500/-700	2.5	1.25	coronal Include the spine and sternum.
SA BODY	Body THIN ST	DMPR	Average	350/50	3	2	sagittal
CO BODY	Body THIN ST	DMPR	Average	350/50	3	2	coronal

Reformats for the L-spine (remember, if a T-Spine is ordered you must scan a separate T-Spine since the Trauma Chest series of the Trauma CAP is not meant for spine reformats):

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
CO ST	THIN ST	Manual	Average	450/50	2	1	Coronal
CO BONE	THIN BONE	Manual	Average	2500/350	2	1	Coronal
SA ST	THIN ST	Manual	Average	450/50	2	1	Sagittal
SA BONE	THIN BONE	Manual	Average	2500/350	2	1	Sagittal

Networking

- Chest scan send all series to PACS (ALI_Store) including the Dose Information Slide.
- All body images are networked to PACS (ALI_Store).
- Note: if smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

Miscellaneous

None

Acquisition Parameters

Series 1, Scout

	Small	Medium	Large
Scout 1 kV	100	120	140
Scout 1 mA	10	10	10
Scout 1 Angle	180	180	180
Scout 2 kV	100	120	140
Scout 2 mA	40	40	80
Scout 2 Angle	90	90	90
WW/WL for Scout	500/50	500/50	500/50

Series 2, Smart Prep

	Small	Medium	Large
mA	40	40	40
Monitoring Delay (sec)	15	15	15
Monitoring ISD (sec)	3	3	3
Enhancement Threshold (HU)	100	100	100
Diagnostic Delay	Auto Minimum	Auto Minimum	Auto Minimum

Series 2, Group 1, Scan Phase

	Small	Medium	Large
Scan Type	Helical	Helical	Helical
Beam Collimation	40	40	40
Detector Rows	64.0	64.0	64.0
Detector Configuration	64x0.625	64x0.625	64x0.625
Scan FOV	Large Body	Large Body	Large Body
Pitch	1.375	1.375	1.375
Speed (mm/rot)	55.00	55.00	55.00
Rotation Time (s)	0.6	0.7	0.9
kV	100	120	140
AEC type	smart mA	smart mA	smart mA
mA Range	(35-420)	(35-540)	(25-490)
Manual mA	260.0	270.0	280.0
Noise Index	16.5	18.5	24.0
Slice Thickness (mm)	3.75	3.75	3.75
Interval (mm)	2.5	2.5	2.5

Series 2, Group 1, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option			
ASiR/ASiR256/DLIR	**30% / 20% / Medium**	**30% / 20% / Medium**	**30% / 20% / Medium**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.5**	**2.5**	**2.5**
Recon 2 (Secondary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**30% / 20% / Medium**	**30% / 20% / Medium**	**30% / 20% / Medium**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**
Recon 3 (Secondary)			
DFOV	**30**	**40**	**50**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**1500/-700**	**1500/-700**	**1500/-700**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**	**None**	**None**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Series 2, Group 2, Scan Phase

	Small	Medium	Large
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**40**	**40**	**40**
Detector Rows	**64.0**	**64.0**	**64.0**
Detector Configuration	**64x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Large Body**	**Large Body**	**Large Body**
Pitch	**0.516**	**0.516**	**0.516**
Speed (mm/rot)	**20.60**	**20.60**	**20.60**
Rotation Time (s)	**0.6**	**0.8**	**1**
kV	**100**	**120**	**140**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(60-470)**	**(50-530)**	**(45-500)**
Manual mA	**300.0**	**270.0**	**280.0**
Noise Index	**10.5**	**12.0**	**15.5**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.5**	**2.5**	**2.5**

Series 2, Group 2, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**350/50**	**350/50**	**350/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option			
ASiR/ASiR256/DLIR	**40% / 20% / Low**	**40% / 20% / Low**	**40% / 20% / Low**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.5**	**2.5**	**2.5**
Recon 2 (Secondary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**350/50**	**350/50**	**350/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**40% / 20% / Low**	**40% / 20% / Low**	**40% / 20% / Low**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**
Recon 4 (Secondary)			
DFOV	**16**	**16**	**16**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**2500/350**	**2500/350**	**2500/350**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**	**None**	**None**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**
Recon 5 (Secondary)			
DFOV	**16**	**16**	**16**
Recon Type	**Soft**	**Soft**	**Soft**
WW/WL	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**60% / 30% / High**	**60% / 30% / High**	**60% / 30% / High**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**
Recon 6 (Secondary)			
DFOV	**16**	**16**	**16**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**2500/350**	**2500/350**	**2500/350**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**	**None**	**None**
Slice Thickness (mm)	**0.625**	**0.625**	**0.625**
Interval (mm)	**0.312**	**0.312**	**0.312**

16 & 32 Slice Scanner Exceptions:

1. The 0.625mm slice thickness x 0.312mm interval Recon should be 1.25mm slice thickness x 0.625mm interval on 16 and 32 slice CT scanners. The 16 and 32 slice scanners are only able to recon down to 0.625mm slice thickness when using 10mm and/or 20mm beam collimation respectively. However, when using 20mm and/or 40mm beam collimation, they are only capable of reconstructing to 1.25mm slice thickness.
2. MARS feature is not an option.
3. IQ Enhance feature requires thin slices (1.25mm or less) with an interval of half (or less). On older scanner models, in order to enable IQ Enhance at 0.625 mm slice thickness, the interval must be set to 0.311 mm instead of 0.312 mm.

DLIR Limitations:

1. DLIR is not available on the Primary Recon.
2. DLIR is only compatible with the Standard Algorithm. So, in instances where the primary recon is Soft algorithm,(i.e. many Neuro Protocols) the subsequent recons will be in Standard Algorithm to enable DLIR. The slight difference between the Soft and Standard Algorithms is outweighed by the improvement in image quality with DLIR enabled.
3. DLIR requires an interval exactly half of the slice thickness.
4. DLIR doesn't allow an interval of 0.312 mm. So, if you are on a DLIR enabled scanner, the thin 0.625 recon will be at 0.625x0.625 mm. On all other scanners the thin recon will be at 0.625x0.312 mm.

Series 3, Scan Phase

	Small	Medium	Large
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**40**	**40**	**40**
Detector Rows	**64.0**	**64.0**	**64.0**
Detector Configuration	**64x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Large Body**	**Large Body**	**Large Body**
Pitch	**0.516**	**0.516**	**0.516**
Speed (mm/rot)	**20.60**	**20.60**	**20.60**
Rotation Time (s)	**0.5**	**0.5**	**0.6**
kV	**100**	**120**	**140**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(40-320)**	**(50-480)**	**(40-470)**
Manual mA	**200.0**	**240.0**	**270.0**
Noise Index	**14.0**	**16.0**	**20.5**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.5**	**2.5**	**2.5**

Series 3, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**350/50**	**350/50**	**350/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option			
ASiR/ASiR256/DLIR	**40% / 20% / Low**	**40% / 20% / Low**	**40% / 20% / Low**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.5**	**2.5**	**2.5**
Recon 2 (Secondary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**350/50**	**350/50**	**350/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**40% / 20% / Low**	**40% / 20% / Low**	**40% / 20% / Low**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Abd/Pelvis 6.1/6.2/6.3

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Indication

Evaluate for abdominal pathology other than hypervascular tumors.

Video for this protocol

Oral Contrast

Mix 4mL Iohexol 300 (Omnipaque) 300 MG/ML injection in 200mL of a clear liquid.

Give a total of 4 doses = 800mL (1 dose every 20 minutes over of an hour).

Give an additional dose on the CT scan table. Mix 8mL Iohexol 300 (Omnipaque) in 200mL of clear liquid.

If the patient is a bariatric post-op patient they will not drink up on the floor. Rather, they will get one 2x concentrated dose on CT table: 8mL of Iohexol in 200 mL of clear liquid. If you have questions please ask the protocolling radiologist.

Pre-Scan Instructions

Clamp Foley catheter prior to scanning. Make sure to place Foley below the level of the bladder.

IV Contrast Parameters 350

Select the Ulrich Weight-Based Adult 3mL protocol which will load the following settings: Saline Test Bolus 3mL/sec Weight based volume 3mL/sec (see below) Saline Flush 50 mL 3mL/sec

Iohexol (Omnipaque) 350 mg/mL injection at a rate of 3 mL/sec

For sites without the Ulrich use Medrad p3T or refer to the weight based contrast tables included with the protocol booklet.

IV Contrast Parameters 300/370

Medrad™ P3T Abdomen protocol.

Iohexol (Omnipaque) 300 mg/mL injection at a rate of 3 mL/sec

For sites without the Medrad™ P3T or P3T PA option, refer to the weight based contrast tables we provide in the protocol booklet.

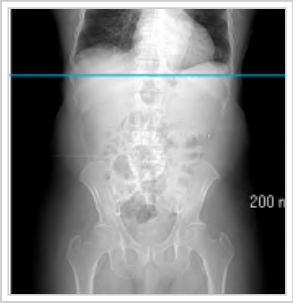
Field of View

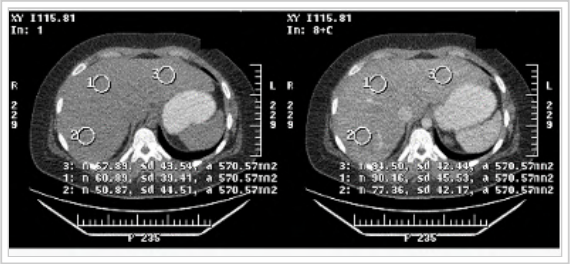
Same as previous study or as small as appropriate

Scan Description

- Series 1 - PA & lateral scout: from diaphragm through iliac crest or pubic symphysis
- Series 2 – Helical Scan

- Scan Phase: Scanned at approximately 70 seconds from the start of the injection, based on Smart Prep time/density graph. Start scan just above the diaphragm, end just below pubic symphysis. If no pelvis is ordered/ indicated, end scan at iliac crests.
- Smart Prep- Monitor Phase: Center over the liver. Put ROI (3) in the liver. Threshold 50 Hounsfield units. No less than 60 and no more than 80 second delay.





Reformat Instructions

Use DMPR on THIN ST.

Reformats

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
SA BODY	THIN ST	DMPR	Average	350/50	3	2	sagittal
CO BODY	THIN ST	DMPR	Average	350/50	3	2	coronal

Networking

- All images are networked to PACS (ALI_Store).
- Note: If smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

Miscellaneous

None

Acquisition Parameters

Series 1, Scout

	Small	Medium	Large
Scout 1 kV	100	120	140
Scout 1 mA	10	10	10
Scout 1 Angle	180	180	180
Scout 2 kV	100	120	140
Scout 2 mA	40	40	80
Scout 2 Angle	90	90	90
WW/WL for Scout	500/50	500/50	500/50

Series 2, Smart Prep

	Small	Medium	Large
mA	40	40	40
Monitoring Delay (sec)	40	40	40
Monitoring ISD (sec)	3	3	3
Enhancement Threshold (HU)	50	50	50
Diagnostic Delay	Auto Minimum	Auto Minimum	Auto Minimum

Series 2, Scan Phase

	Small	Medium	Large
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**40**	**40**	**40**
Detector Rows	**64.0**	**64.0**	**64.0**
Detector Configuration	**64x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Large Body**	**Large Body**	**Large Body**
Pitch	**0.516**	**0.516**	**0.516**
Speed (mm/rot)	**20.60**	**20.60**	**20.60**
Rotation Time (s)	**0.5**	**0.5**	**0.6**
kV	**100**	**120**	**140**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(40-320)**	**(50-480)**	**(40-470)**
Manual mA	**200.0**	**240.0**	**270.0**
Noise Index	**14.0**	**16.0**	**20.5**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.5**	**2.5**	**2.5**

Series 2, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**350/50**	**350/50**	**350/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option			
ASiR/ASiR256/DLIR	**40% / 20% / Low**	**40% / 20% / Low**	**40% / 20% / Low**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.5**	**2.5**	**2.5**
Recon 2 (Secondary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**350/50**	**350/50**	**350/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**40% / 20% / Low**	**40% / 20% / Low**	**40% / 20% / Low**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Trauma - Abd/Pelvis 6.4/6.5/6.6

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Indication

Emergency evaluation for aortic injury or organ disruption. Routine creatinine cut-off for IV contrast administration does not apply in a trauma.

Video for this protocol

Oral Contrast

None

Pre-Scan Instructions

Clamp Foley catheter prior to scanning. Make sure to place Foley below the level of the bladder.

IV Contrast Parameters 350

Select the Ulrich Weight-Based Adult 3mL protocol which will load the following settings: Saline Test Bolus 3mL/sec Weight based volume 3mL/sec (see below) Saline Flush 50 mL 3mL/sec

Iohexol (Omnipaque) 350 mg/mL injection at a rate of 3 mL/sec

For sites without the Ulrich use Medrad p3T or refer to the weight based contrast tables included with the protocol booklet.

IV Contrast Parameters 300/370

Medrad™ P3T Abdomen protocol.

Iohexol (Omnipaque) 300 mg/mL injection at a rate of 3 mL/sec

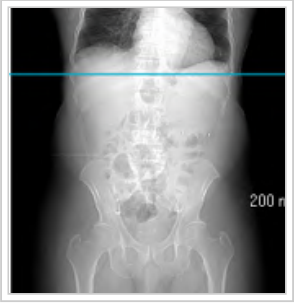
For sites without the Medrad™ P3T or P3T PA option, refer to the weight based contrast tables we provide in the protocol booklet.

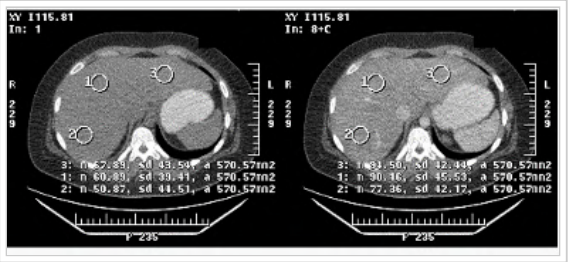
Field of View

Same as previous study or as small as appropriate

Scan Description

- **Series 1** - PA & lateral scout: from diaphragm through iliac crests or pubic symphysis.
- **Series 2** - Scan Phase: Start scan just above the top of the diaphragm and end just below the pubic symphysis.
  - Smart Prep- Monitor Phase: Center over the liver. Put the ROI in the liver. Threshold 50 Hounsfield units. No greater than 80 second delay.





- **Series 3** - Delayed (Optional per MD) 7 minute delayed scans from the top of the kidneys through the bladder

Reformats

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
SA BODY	THIN ST	DMPR	Average	350/50	3	2	sagittal
CO BODY	THIN ST	DMPR	Average	350/50	3	2	coronal

Reformats for the spine:

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
CO ST	THIN ST	Manual	Average	450/50	2	1	Coronal
CO BONE	THIN Bone	Manual	Average	2500/350	2	1	Coronal
SA ST	THIN ST	Manual	Average	450/50	2	1	Sagittal
SA BONE	THIN BONE	Manual	Average	2500/350	2	1	Sagittal

Reformat Instructions

Extra Recons on Trauma Protocols:

- In Trauma patients, we Retro Recon our L-spines from the Trauma Abd/Pel protocol. We no longer retro T spines off the Trauma Chest as mentioned in the revisions.
- Trauma Abd/Pelvis or Trauma Chest/Abd/Pelvis recons occupy the first 2 and 3 recons respectively. The subsequent 3 recons are pre-set for L spine scan parameters. You can turn these on if you have an order to recon the spine for the patient.
    - Remember once you turn these recons on you must adjust the FOV, start and end location, R/L centering, and A/P centering.
    - Remember to turn off these additional recons if you have to add a group to the end of your scan (get through the pelvis), or it will add that small group to the end of your L-spine.

Use Exam Split or Anonymize exam to separate the Lumbar Spine from the Trauma C/A/P or Trauma A/P.

Networking

- All images are networked to PACS (ALI_Store).
- Note: If smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

Miscellaneous

None

Acquisition Parameters

Series 1, Scout

	Small	Medium	Large
Scout 1 kV	**100**	**120**	**140**
Scout 1 mA	**10**	**10**	**10**
Scout 1 Angle	**180**	**180**	**180**
Scout 2 kV	**100**	**120**	**140**
Scout 2 mA	**40**	**40**	**80**
Scout 2 Angle	**90**	**90**	**90**
WW/WL for Scout	**500/50**	**500/50**	**500/50**

Series 2, Smart Prep

	Small	Medium	Large
mA	**40**	**40**	**40**
Monitoring Delay (sec)	**40**	**40**	**40**
Monitoring ISD (sec)	**3**	**3**	**3**
Enhancement Threshold (HU)	**50**	**50**	**50**
Diagnostic Delay	**Auto Minimum**	**Auto Minimum**	**Auto Minimum**

Series 2, Scan Phase

	Small	Medium	Large
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**40**	**40**	**40**
Detector Rows	**64.0**	**64.0**	**64.0**
Detector Configuration	**64x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Large Body**	**Large Body**	**Large Body**
Pitch	**0.516**	**0.516**	**0.516**
Speed (mm/rot)	**20.60**	**20.60**	**20.60**
Rotation Time (s)	**0.6**	**0.8**	**1**
kV	**100**	**120**	**140**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(60-470)**	**(50-530)**	**(45-500)**
Manual mA	**300.0**	**270.0**	**280.0**
Noise Index	**10.5**	**12.0**	**15.5**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.5**	**2.5**	**2.5**

Series 2, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**350/50**	**350/50**	**350/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option			
ASiR/ASiR256/DLIR	**40% / 20% / Low**	**40% / 20% / Low**	**40% / 20% / Low**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.5**	**2.5**	**2.5**
Recon 2 (Secondary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**350/50**	**350/50**	**350/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**40% / 20% / Low**	**40% / 20% / Low**	**40% / 20% / Low**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Recon 3 (Secondary)			
DFOV	**16**	**16**	**16**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**2500/350**	**2500/350**	**2500/350**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**	**None**	**None**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**
Recon 4 (Secondary)			
DFOV	**16**	**16**	**16**
Recon Type	**Soft**	**Soft**	**Soft**
WW/WL	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**60% / 30% / High**	**60% / 30% / High**	**60% / 30% / High**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**
Recon 5 (Secondary)			
DFOV	**16**	**16**	**16**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**2500/350**	**2500/350**	**2500/350**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**	**None**	**None**
Slice Thickness (mm)	**0.625**	**0.625**	**0.625**
Interval (mm)	**0.312**	**0.312**	**0.312**

16 & 32 Slice Scanner Exceptions:

1. The 0.625mm slice thickness x 0.312mm interval Recon should be 1.25mm slice thickness x 0.625mm interval on 16 and 32 slice CT scanners. The 16 and 32 slice scanners are only able to recon down to 0.625mm slice thickness when using 10mm and/or 20mm beam collimation respectively. However, when using 20mm and/or 40mm beam collimation, they are only capable of reconstructing to 1.25mm slice thickness.
2. MARS feature is not an option.
3. IQ Enhance feature requires thin slices (1.25mm or less) with an interval of half (or less). On older scanner models, in order to enable IQ Enhance at 0.625 mm slice thickness, the interval must be set to 0.311 mm instead of 0.312 mm.

DLIR Limitations:

1. DLIR is not available on the Primary Recon.
2. DLIR is only compatible with the Standard Algorithm. So, in instances where the primary recon is Soft algorithm,(i.e. many Neuro Protocols) the subsequent recons will be in Standard Algorithm to enable DLIR. The slight difference between the Soft and Standard Algorithms is outweighed by the improvement in image quality with DLIR enabled.
3. DLIR requires an interval exactly half of the slice thickness.
4. DLIR doesn't allow an interval of 0.312 mm. So, if you are on a DLIR enabled scanner, the thin 0.625 recon will be at 0.625x0.625 mm. On all other scanners the thin recon will be at 0.625x0.312 mm.

Series 3, Scan Phase

	Small	Medium	Large
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**40**	**40**	**40**
Detector Rows	**64.0**	**64.0**	**64.0**
Detector Configuration	**64x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Large Body**	**Large Body**	**Large Body**
Pitch	**0.516**	**0.516**	**0.516**
Speed (mm/rot)	**20.60**	**20.60**	**20.60**
Rotation Time (s)	**0.5**	**0.5**	**0.6**
kV	**100**	**120**	**140**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(40-320)**	**(50-480)**	**(40-470)**
Manual mA	**200.0**	**240.0**	**270.0**
Noise Index	**14.0**	**16.0**	**20.5**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.5**	**2.5**	**2.5**

Series 3, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**350/50**	**350/50**	**350/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option			
ASiR/ASiR256/DLIR	**40% / 20% / Low**	**40% / 20% / Low**	**40% / 20% / Low**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.5**	**2.5**	**2.5**
Recon 2 (Secondary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**350/50**	**350/50**	**350/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**40% / 20% / Low**	**40% / 20% / Low**	**40% / 20% / Low**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

High Image Quality Cancer Follow-Up Abd/Pelvis 6.7/6.8/6.9

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Indication

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).

- Use HIQ on Colorectal, Pancreas, Esophageal, Lung and Breast cancer.
- Use HIQ on patients with Cholangiocarcinoma. If 12 min delays are needed, the RAD will mention in the comment section to scan through the abdomen only using the flank pain protocol.
- Do not use HIQ on Lymphoma or Testicular cancer
- Use Biphasic protocol on hypervascular metastatic disease (Renal cell and Neuroendocrine tumors)

Oral Contrast

Mix 4mL Iohexol 300 (Omnipaque) 300 MG/ML injection in 200mL of a clear liquid.

Give a total of 4 doses = 800mL (1 dose every 20 minutes over of an hour).

Give an additional dose on the CT scan table. Mix 8mL Iohexol 300 (Omnipaque) in 200mL of clear liquid.

If the patient is a bariatric post-op patient they will not drink up on the floor. Rather, they will get one 2x concentrated dose on CT table: 8mL of Iohexol in 200 mL of clear liquid. If you have questions please ask the protocolling radiologist.

Pre-Scan Instructions

Clamp Foley catheter prior to scanning. Make sure to place Foley below the level of the bladder.

IV Contrast Parameters 350

Select the Ulrich Weight-Based Adult 3mL protocol which will load the following settings: Saline Test Bolus 3mL/sec Weight based volume 3mL/sec (see below) Saline Flush 50 mL 3mL/sec

Iohexol (Omnipaque) 350 mg/mL injection at a rate of 3 mL/sec

For sites without the Ulrich use Medrad p3T or refer to the weight based contrast tables included with the protocol booklet.

IV Contrast Parameters 300/370

Medrad™ P3T Abdomen protocol.

Iohexol (Omnipaque) 300 mg/mL injection at a rate of 3 mL/sec

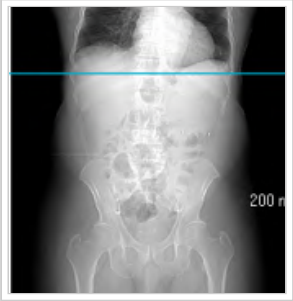
For sites without the Medrad™ P3T or P3T PA option, refer to the weight based contrast tables we provide in the protocol booklet.

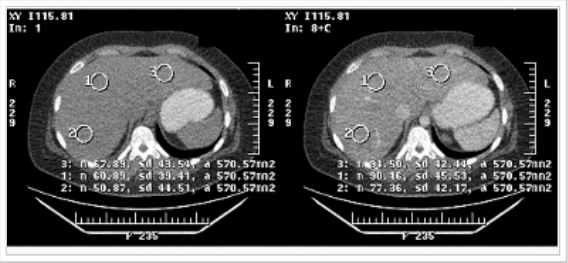
Field of View

Same as previous study or as small as appropriate

Scan Description

- Series 1 - PA & lateral scout: from diaphragm through iliac crest or pubic symphysis
- Series 2 – Helical Scan
  - Scan Phase: Scanned at approximately 70 seconds from the start of the injection, based on Smart Prep time/density graph. Start scan just above the diaphragm, end just below pubic symphysis. If no pelvis is ordered/ indicated, end scan at iliac crests.
  - Smart Prep- Monitor Phase: Center over the liver. Put ROI (3) in the liver. Threshold 50 Hounsfield units. No less than 60 and no more than 80 second delay.





Reformat Instructions

Use DMPR on THIN ST.

Reformats

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
SA BODY	THIN ST	DMPR	Average	350/50	3	2	sagittal
CO BODY	THIN ST	DMPR	Average	350/50	3	2	coronal

Networking

- All images are networked to PACS (ALI_Store).
- Note: If smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

Miscellaneous

None

Acquisition Parameters

Series 1, Scout

	Small	Medium	Large
Scout 1 kV	100	120	140
Scout 1 mA	10	10	10
Scout 1 Angle	180	180	180
Scout 2 kV	100	120	140
Scout 2 mA	40	40	80
Scout 2 Angle	90	90	90
WW/WL for Scout	500/50	500/50	500/50

Series 2, Smart Prep

	Small	Medium	Large
mA	**40**	**40**	**40**
Monitoring Delay (sec)	**40**	**40**	**40**
Monitoring ISD (sec)	**3**	**3**	**3**
Enhancement Threshold (HU)	**50**	**50**	**50**
Diagnostic Delay	**Auto Minimum**	**Auto Minimum**	**Auto Minimum**

Series 2, Scan Phase

	Small	Medium	Large
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**40**	**40**	**40**
Detector Rows	**64.0**	**64.0**	**64.0**
Detector Configuration	**64x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Large Body**	**Large Body**	**Large Body**
Pitch	**0.516**	**0.516**	**0.516**
Speed (mm/rot)	**20.60**	**20.60**	**20.60**
Rotation Time (s)	**0.6**	**0.8**	**1**
kV	**100**	**120**	**140**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(60-470)**	**(50-530)**	**(45-500)**
Manual mA	**300.0**	**270.0**	**280.0**
Noise Index	**10.5**	**12.0**	**15.5**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.5**	**2.5**	**2.5**

Series 2, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**350/50**	**350/50**	**350/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option			
ASiR/ASiR256/DLIR	**40% / 20% / Low**	**40% / 20% / Low**	**40% / 20% / Low**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.5**	**2.5**	**2.5**
Recon 2 (Secondary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**350/50**	**350/50**	**350/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**40% / 20% / Low**	**40% / 20% / Low**	**40% / 20% / Low**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Abd/Pelvis - Flank Pain 6.10/6.11/6.12

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Indication

For patients with acute flank pain, have hydronephrosis, or who are being evaluated for renal stones but don't have a prior study, we are performing a full flank pain CT (non contrast abd/pelvis)

Oral Contrast

Scan with a full bladder. Hydrate ER patients if time allows.

Pre-Scan Instructions

Clamp Foley catheter prior to scanning. Make sure to place Foley below the level of the bladder.

IV Contrast Parameters

None

Field of View

Same as previous study or as small as appropriate

Scan Description

- Series 1 - PA and lateral scouts: from diaphragm through pubic symphysis
- Series 2 - W/O IV Contrast - Start at the top of the kidneys and end at the base of the bladder.
- If Radiologist wants to convert to with IVC use the routine Abd/Pel protocol.

Reformat Instructions

Use DMPR on THIN ST.

Reformats

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
SA BODY	THIN ST	DMPR	Average	350/50	3	2	sagittal
CO BODY	THIN ST	DMPR	Average	350/50	3	2	coronal

Networking

- All Images to PACS (ALI_Store).
- Note: if smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

Miscellaneous

- If diagnosis is uncertain and contrast is needed convert to a routine abd/pel, creatinine level is not necessary.

Acquisition Parameters

Series 1, Scout

	Small	Medium	Large
Scout 1 kV	**100**	**120**	**140**
Scout 1 mA	**10**	**10**	**10**
Scout 1 Angle	**180**	**180**	**180**
Scout 2 kV	**100**	**120**	**140**
Scout 2 mA	**40**	**40**	**80**
Scout 2 Angle	**90**	**90**	**90**
WW/WL for Scout	**500/50**	**500/50**	**500/50**

Series 2, Scan Phase

	Small	Medium	Large
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**40**	**40**	**40**
Detector Rows	**64.0**	**64.0**	**64.0**
Detector Configuration	**64x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Large Body**	**Large Body**	**Large Body**
Pitch	**0.516**	**0.516**	**0.516**
Speed (mm/rot)	**20.60**	**20.60**	**20.60**
Rotation Time (s)	**0.5**	**0.5**	**0.6**
kV	**100**	**120**	**140**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(40-320)**	**(50-480)**	**(40-470)**
Manual mA	**200.0**	**240.0**	**270.0**
Noise Index	**14.0**	**16.0**	**20.5**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.5**	**2.5**	**2.5**

Series 2, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**350/50**	**350/50**	**350/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option			
ASiR/ASiR256/DLIR	**40% / 20% / Low**	**40% / 20% / Low**	**40% / 20% / Low**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.5**	**2.5**	**2.5**
Recon 2 (Secondary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**350/50**	**350/50**	**350/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**40% / 20% / Low**	**40% / 20% / Low**	**40% / 20% / Low**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Limited Follow-Up Kidneys Only 6.13/6.14/6.15

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Indication

For patients with known stones (based on prior flank pain CT) who are asymptomatic and being evaluated for stone burden, we are doing the limited renal stone follow up (limited z axis coverage of the kidneys just to look at stone burden).

Optional limited variant: follow-up for renal calculi (kidneys only).

Oral Contrast

Give a total 800 mL of water prior to scan (A 200mL dose every 20 minutes over an hour) if time allows. Scan the patient with a full bladder.

Pre-Scan Instructions

Clamp Foley catheter prior to scanning. Make sure to place Foley below the level of the bladder.

IV Contrast Parameters

None

Field of View

Same as previous study or as small as appropriate

Scan Description

LIMITED exam for renal stone follow-up: (If the patient is extremely large use routine flank pain)

- Series 1 - PA and lateral scouts: from diaphragm through pubic symphysis
- Series 2 - W/O IV Contrast - Start at the top of the kidneys and end at bottom of the kidneys (approximately T12-L4 to rule out calculi).

Reformat Instructions

Use DMPR on THIN ST.

Reformats

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
SA BODY	THIN ST	DMPR	Average	350/50	3	2	sagittal
CO BODY	THIN ST	DMPR	Average	350/50	3	2	coronal

Networking

- All Images to PACS (ALI_Store).
- Note: if smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

Miscellaneous

None

Acquisition Parameters

Series 1, Scout

	Small	Medium	Large
Scout 1 kV	**100**	**120**	**140**
Scout 1 mA	**10**	**10**	**10**
Scout 1 Angle	**180**	**180**	**180**
Scout 2 kV	**100**	**120**	**140**
Scout 2 mA	**40**	**40**	**80**
Scout 2 Angle	**90**	**90**	**90**
WW/WL for Scout	**500/50**	**500/50**	**500/50**

Series 2, Scan Phase

	Small	Medium	Large
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**40**	**40**	**40**
Detector Rows	**64.0**	**64.0**	**64.0**
Detector Configuration	**64x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Large Body**	**Large Body**	**Large Body**
Pitch	**0.984**	**0.984**	**0.984**
Speed (mm/rot)	**39.40**	**39.40**	**39.40**
Rotation Time (s)	**0.5**	**0.5**	**0.6**
kV	**100**	**120**	**140**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(40-300)**	**(45-450)**	**(40-440)**
Manual mA	**190.0**	**230.0**	**250.0**
Noise Index	**20.0**	**22.5**	**29.0**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.5**	**2.5**	**2.5**

Series 2, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**350/50**	**350/50**	**350/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option			
ASiR/ASiR256/DLIR	**40% / 20% / Low**	**40% / 20% / Low**	**40% / 20% / Low**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.5**	**2.5**	**2.5**
Recon 2 (Secondary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**350/50**	**350/50**	**350/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**40% / 20% / Low**	**40% / 20% / Low**	**40% / 20% / Low**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Abd/Pelvis - Colonography 6.16/6.17/6.18

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Indication

Suspicion or evaluation of polyps or other abnormalities within the colon.

Oral Contrast

None

Pre-Scan Instructions

Make sure the patient has been prepped properly. Encourage use of restroom.

Place the patient on the CT table on their left side to insufflate the colon with CO2, left decubitus for ~ 1.5 liters, right decubitus for another 2.0-2.5 L for a total volume of 3.5-4.0 L, and then roll supine and assess for equilibrium pressures. If equilibrium pressures present, then scan supine series. Please be sure that carbon dioxide remains continuously infusing throughout the scan.

If the patient cannot lie on their stomach for the prone series, you can go straight to the Right Lateral Decubitus series after the supine series and add the Left Lateral if needed.

- **Proper positioning for the decubitus portion of the CTC screening exam**

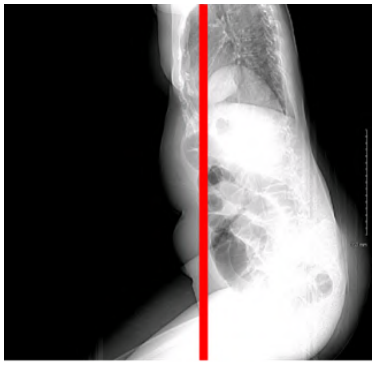
Just as patient positioning is critical in our routine supine and prone exams, it is also critical in the decubitus portion of our virtual colonoscopy screening exam. To provide the best image quality at the lowest dose, proper patient centering in the scanner gantry is critically important.
You cannot simply have the patient roll to their side, this will leave their pelvis in an off center position! You must have the patient roll and then confirm that they have shifted their pelvis back to the center of the couch. **Roll and shift!** Aim to get the patient's ilium bones centered in the scanner.
Note, it is also possible that after proper positioning, the patient may tilt to the side before the scan. Tilting to the side is a natural response to being placed in the decubitus position. Please watch for this and instruct the patient to return to the proper position.

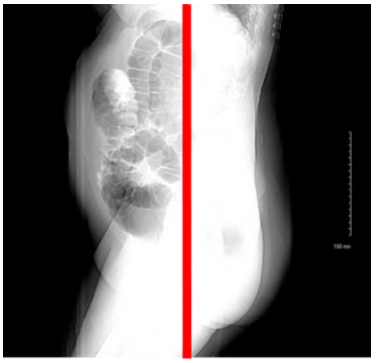
Poor Position

Bad Looking Scout

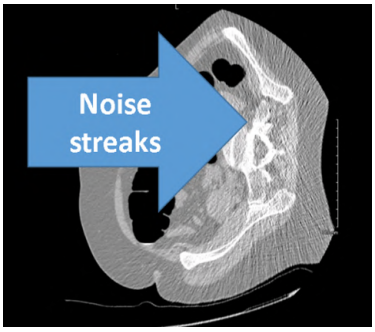
Good Position

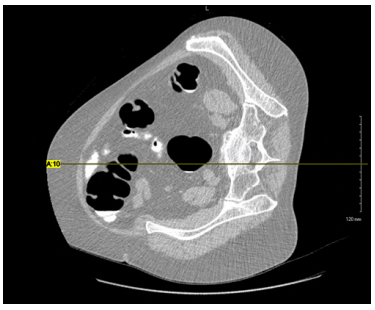
Good Looking Scout





Resulting Bad Looking Image **Resulting Good Looking Image**





Bone Density Scanning

- Supine Only: Invert patient toes, include lesser trochanters. Recon 3 is Pelvis only 2.5 x 2.5 (send to QCT-HIP)

IV Contrast Parameters

None

Field of View

Same as previous study or as small as appropriate

Scan Description

Scan is performed supine and prone on expiration.

- Series 1 - PA & Lateral supine scouts: top of the diaphragm through pubic symphysis
- Series 2 - Supine – Start above the highest flexure of the colon and scan through the rectum. Review images to check for proper colonic distention, pay special attention to sigmoid distention.
- Series 3 – Prone scouts: top of diaphragm through pubic symphysis.
  - After the scout deflate the balloon before scanning.
- Series 4 – Prone – Start above the highest flexure of the colon and scan though the rectum. Review images to check for proper colonic distention.
- Consider right decubitus Series 5 and 6 (Scout and Scan) if areas of sigmoid collapse are present on both views. These series are built into the protocol, you do not have to repeat series.

Reformat Instructions

Use DMPR on THIN ST.

Reformats

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
SA BODY	THIN ST	DMPR	Average	350/50	3	2	sagittal
CO BODY	THIN ST	DMPR	Average	350/50	3	2	coronal

Networking

- Send all images to PACS (ALI_Store).
- Send the THIN ST 1.25mm images from series 3 & 6 to these 2 destinations V3D3_Primary & V3D_Secondary.
- Bone Density Recon 3 is sent to QCT-HIP and PACS (ALI_Store).
- Reformats are sent to PACS (ALI_Store)
- Note: if smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

Miscellaneous

None.

Acquisition Parameters

Series 1, Scout

	Small	Medium	Large
Scout 1 kV	**100**	**120**	**140**
Scout 1 mA	**10**	**10**	**10**
Scout 1 Angle	**180**	**180**	**180**
Scout 2 kV	**100**	**120**	**140**
Scout 2 mA	**40**	**40**	**80**
Scout 2 Angle	**90**	**90**	**90**
WW/WL for Scout	**500/50**	**500/50**	**500/50**

Series 2, Scan Phase

	Small	Medium	Large
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**40**	**40**	**40**
Detector Rows	**64.0**	**64.0**	**64.0**
Detector Configuration	**64x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Large Body**	**Large Body**	**Large Body**
Pitch	**1.375**	**1.375**	**1.375**
Speed (mm/rot)	**55.00**	**55.00**	**55.00**
Rotation Time (s)	**0.5**	**0.5**	**0.5**
kV	**120**	**120**	**120**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(30-420)**	**(30-420)**	**(30-420)**
Manual mA	**150**	**150**	**150**
Noise Index	**25.0**	**25.0**	**25.0**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.5**	**2.5**	**2.5**

Series 2, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**350/50**	**350/50**	**350/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option			
ASiR/ASiR256/DLIR	**40% / 20% / Low**	**40% / 20% / Low**	**40% / 20% / Low**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.5**	**2.5**	**2.5**
Recon 2 (Secondary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**2000/0**	**2000/0**	**2000/0**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**	**None**	**None**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**
Recon 3 (Secondary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**350/50**	**350/50**	**350/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option			
ASiR/ASiR256/DLIR	**40% / 20% / Low**	**40% / 20% / Low**	**40% / 20% / Low**
Slice Thickness (mm)	**2.5**	**2.5**	**2.5**
Interval (mm)	**2.5**	**2.5**	**2.5**

Series 3, Scout

	Small	Medium	Large
Scout 1 kV	**100**	**120**	**140**
Scout 1 mA	**10**	**10**	**10**
Scout 1 Angle	**180**	**180**	**180**
Scout 2 kV	**100**	**120**	**140**
Scout 2 mA	**40**	**40**	**80**
Scout 2 Angle	**90**	**90**	**90**
WW/WL for Scout	**500/50**	**500/50**	**500/50**

Series 4, Scan Phase

	Small	Medium	Large
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**40**	**40**	**40**
Detector Rows	**64.0**	**64.0**	**64.0**
Detector Configuration	**64x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Large Body**	**Large Body**	**Large Body**
Pitch	**1.375**	**1.375**	**1.375**
Speed (mm/rot)	**55.00**	**55.00**	**55.00**
Rotation Time (s)	**0.5**	**0.5**	**0.5**
kV	**120**	**120**	**120**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(30-420)**	**(30-420)**	**(30-420)**
Manual mA	**150**	**150**	**150**
Noise Index	**60.0**	**60.0**	**60.0**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Series 4, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**2000/0**	**2000/0**	**2000/0**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**	**None**	**None**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Series 5, Scout

	Small	Medium	Large
Scout 1 kV	**100**	**120**	**140**
Scout 1 mA	**10**	**10**	**10**
Scout 1 Angle	**180**	**180**	**180**
Scout 2 kV	**100**	**120**	**140**
Scout 2 mA	**40**	**40**	**80**
Scout 2 Angle	**90**	**90**	**90**
WW/WL for Scout	**500/50**	**500/50**	**500/50**

Series 6, Scan Phase

	Small	Medium	Large
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**40**	**40**	**40**
Detector Rows	**64.0**	**64.0**	**64.0**
Detector Configuration	**64x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Large Body**	**Large Body**	**Large Body**
Pitch	**1.375**	**1.375**	**1.375**
Speed (mm/rot)	**55.00**	**55.00**	**55.00**
Rotation Time (s)	**0.5**	**0.5**	**0.5**
kV	**120**	**120**	**120**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(30-420)**	**(30-420)**	**(30-420)**
Manual mA	**150**	**150**	**150**
Noise Index	**60.0**	**60.0**	**60.0**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Series 6, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**2000/0**	**2000/0**	**2000/0**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**	**None**	**None**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Abd/Pelvis - Urography 6.22/6.23/6.24

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Indication

General renal imaging, hematuria work-up.

Patients < age 45: Urography

Patients > 45: Urothelial tumor follow up

Video for this protocol

Oral Contrast

Patient will arrive with a full bladder.

Have patient void before bringing patient into the scanner.

Give an additional 200mL dose of water on the CT scan table.

Pre-Scan Instructions

None

IV Contrast Parameters 350

Ulrich Protocol 34

Injections	Contrast Dosage	Injection Rate
Injection 1	43 ml Iohexol 350 mgI/mL + 50 mL NaCl flush	1.5 mL/sec
Wait 10 minutes		
Injection 2	86 ml Iohexol 350 mgI/mL + 50 mL NaCl flush	3 mL/sec

IV Contrast Parameters 300/370

Medrad™ Urography protocol

Injections	Contrast Dosage	Injection Rate
Injection 1	50 ml Iohexol 300 mgI/mL + 50 mL NaCl flush	1.5 mL/sec
Wait 10 minutes		
Injection 2	100 ml Iohexol 300 mgI/mL + 50 mL NaCl flush	3 mL/sec

Field of View

Same as previous study or as small as appropriate

Scan Description

- Series 1 - PA & lateral scouts: from top of diaphragm through bladder.
- Series 2 - Without IV contrast: Top of the kidneys through bladder base.
- INJECTION – Inject 50cc of contrast @ 1.5cc/sec. Wait 10 min, THEN proceed to the next series.
- Series 3 - Parenchymal phase: inject the remaining contrast at 3cc/sec. Start the injection and the scanner at the same time, there is a 115 sec delay built into the scanner. Start scan at the top of the diaphragm and end at

pubic symphysis.

Reformat Instructions

- Use DMPR from THIN ST of the non-contrast phase for the first coronal reformats
- Use DMPR from THIN ST of the parenchymal phase for the second set of reformats (sagittal/coronal).

Reformats

Non-Contrast

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
CO BODY	THIN ST	DMPR	Average	350/50	3	2	Coronal

Contrast (do these for all three phases if using the Urothelial tumor follow-up protocol)

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
SA BODY	THIN ST	DMPR	Average	350/50	3	2	sagittal
CO BODY	THIN ST	DMPR	Average	350/50	3	2	coronal

Networking

- All images (including the thin without series) are networked to PACS (ALI_Store).
- Note: if smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

Miscellaneous

None

Acquisition Parameters

Series 1, Scout

	Small	Medium	Large
Scout 1 kV	100	120	140
Scout 1 mA	10	10	10
Scout 1 Angle	180	180	180
Scout 2 kV	100	120	140
Scout 2 mA	40	40	80
Scout 2 Angle	90	90	90
WW/WL for Scout	500/50	500/50	500/50

Series 2, Scan Phase

	Small	Medium	Large
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**40**	**40**	**40**
Detector Rows	**64.0**	**64.0**	**64.0**
Detector Configuration	**64x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Large Body**	**Large Body**	**Large Body**
Pitch	**0.984**	**0.984**	**0.984**
Speed (mm/rot)	**39.40**	**39.40**	**39.40**
Rotation Time (s)	**0.5**	**0.7**	**0.8**
kV	**100**	**120**	**140**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(60-450)**	**(50-480)**	**(40-490)**
Manual mA	**280.0**	**240.0**	**280.0**
Noise Index	**16.5**	**18.5**	**24.0**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.5**	**2.5**	**2.5**

Series 2, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**350/50**	**350/50**	**350/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option			
ASiR/ASiR256/DLIR	**40% / 20% / Low**	**40% / 20% / Low**	**40% / 20% / Low**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.5**	**2.5**	**2.5**
Recon 2 (Secondary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**350/50**	**350/50**	**350/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**40% / 20% / Low**	**40% / 20% / Low**	**40% / 20% / Low**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Series 3, Scan Phase

	Small	Medium	Large
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**40**	**40**	**40**
Detector Rows	**64.0**	**64.0**	**64.0**
Detector Configuration	**64x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Large Body**	**Large Body**	**Large Body**
Pitch	**0.516**	**0.516**	**0.516**
Speed (mm/rot)	**20.60**	**20.60**	**20.60**
Rotation Time (s)	**0.5**	**0.7**	**0.8**
kV	**100**	**120**	**140**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(60-460)**	**(50-490)**	**(45-500)**
Manual mA	**290.0**	**250.0**	**290.0**
Noise Index	**11.5**	**13.5**	**17.0**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.5**	**2.5**	**2.5**

Series 3, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**350/50**	**350/50**	**350/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option			
ASiR/ASiR256/DLIR	**40% / 20% / Low**	**40% / 20% / Low**	**40% / 20% / Low**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.5**	**2.5**	**2.5**
Recon 2 (Secondary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**350/50**	**350/50**	**350/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**40% / 20% / Low**	**40% / 20% / Low**	**40% / 20% / Low**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Abd-Liver - Biphasic 6.25/6.26/6.27

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Indication

Arterial and Venous phase scanning for the evaluation of hypervascular metastatic disease to the liver such as neuroendocrine tumor, RCC.

Videos for this protocol

Liver Scanning:

Biphasic Liver Protocol:

Oral Contrast

Give a total 800 mL of water over the course of one hour prior to scan. Ask patient to drink slowly and steadily.

Give an additional 200mL dose of water on the CT scan table.

Pre-Scan Instructions

None

IV Contrast Parameters 350

Select the Ulrich Weight-Based Adult 5mL protocol which will load the following settings: Saline Test Bolus 5mL/sec Weight based volume 5mL/sec (see below) Saline Flush 30 mL at a rate of 5mL/sec

Iohexol (Omnipaque) 350 mg/mL injection at a rate of 5 mL/sec

For sites without the Ulrich use Medrad p3T or refer to the weight based contrast tables included with the protocol booklet.

IV Contrast Parameters 300/370

Medrad™ P3T Abdomen protocol;

Iohexol (Omnipaque) 300 mg/mL injection at a rate of 5 mL/sec

For sites without the Medrad™ P3T or P3T PA option, refer to the weight based contrast tables we provide in the protocol booklet.

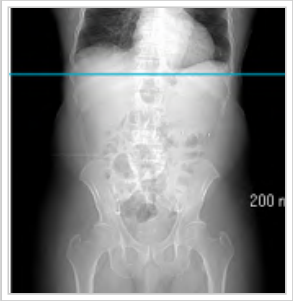
Field of View

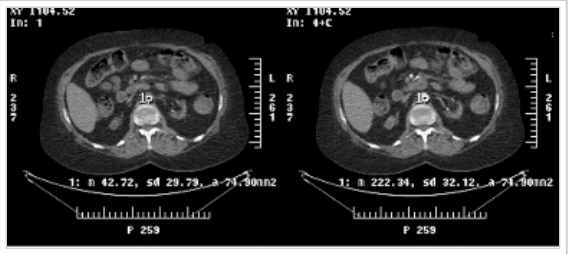
Same as previous study or as small as appropriate

Scan Description

- Series 1 - PA & lateral scout: from top of diaphragm through iliac crests (for abdomen only) or pubic symphysis (if a pelvis is ordered).
- Series 2 - With IV Contrast: This scan is performed in 2 groups.

    - 1st group - Late Arterial Phase - Start scan at the top of the liver and end at the bottom of the liver.
    - 2nd group - Portal Venous Phase - Scanned at 70 seconds from the start of the injection. Adjust Prep Group delay to achieve this. Start at the top of the liver (same place as group 1). For Abdomen only end at the iliac crests or for Abdomen/Pelvis end at pubic symphysis.
- If doing a Chest with a biphasic, include the chest with the 2nd group. Be sure to subtract the amount of time it takes to scan through the chest from the 70 seconds from the start of injection. CT2 has a Quick Guide for Biphasic/Chest Combo.
    - Smart Prep- Monitor Phase: Place ROI on the aorta at the level of mid liver. **Dynamic transition is turned on so the scan will progress without the need for you to hit 'scan phase'.** There will be a 15 second diagnostic delay built in.





Reformat Instructions

If doing a chest turn off DMPR and do reformats manually for both the Chest and Abdomen/Pelvis separately.

Reformats

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
SA BODY	THIN ST	DMPR	Average	350/50	3	2	sagittal
CO BODY	THIN ST	DMPR	Average	350/50	3	2	coronal

Networking

- Chest scan send all series to PACS (ALI_Store) including the Dose Information Slide.
- All body images are networked to PACS (ALI_Store).
- Note: if smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

Miscellaneous

None

Acquisition Parameters

Series 1, Scout

	Small	Medium	Large
Scout 1 kV	100	120	140
Scout 1 mA	10	10	10
Scout 1 Angle	180	180	180
Scout 2 kV	100	120	140
Scout 2 mA	40	40	80
Scout 2 Angle	90	90	90
WW/WL for Scout	500/50	500/50	500/50

Series 2, Smart Prep

	Small	Medium	Large
mA	**40**	**40**	**40**
Monitoring Delay (sec)	**15**	**15**	**15**
Monitoring ISD (sec)	**3**	**3**	**3**
Enhancement Threshold (HU)	**100**	**100**	**100**
Diagnostic Delay	**15**	**15**	**15**

Series 2, Group 1, Scan Phase

	Small	Medium	Large
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**40**	**40**	**40**
Detector Rows	**64.0**	**64.0**	**64.0**
Detector Configuration	**64x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Large Body**	**Large Body**	**Large Body**
Pitch	**0.516**	**0.516**	**0.516**
Speed (mm/rot)	**20.60**	**20.60**	**20.60**
Rotation Time (s)	**0.6**	**0.7**	**0.7**
kV	**80**	**100**	**120**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(50-380)**	**(45-430)**	**(40-460)**
Manual mA	**240.0**	**210.0**	**260.0**
Noise Index	**17.5**	**19.0**	**24.0**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.5**	**2.5**	**2.5**

Series 2, Group 1, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**350/50**	**350/50**	**350/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option			
ASiR/ASiR256/DLIR	**40% / 20% / Low**	**40% / 20% / Low**	**40% / 20% / Low**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.5**	**2.5**	**2.5**
Recon 2 (Secondary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**350/50**	**350/50**	**350/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**40% / 20% / Low**	**40% / 20% / Low**	**40% / 20% / Low**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Series 2, Group 2, Scan Phase

	Small	Medium	Large
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**40**	**40**	**40**
Detector Rows	**64.0**	**64.0**	**64.0**
Detector Configuration	**64x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Large Body**	**Large Body**	**Large Body**
Pitch	**0.516**	**0.516**	**0.516**
Speed (mm/rot)	**20.60**	**20.60**	**20.60**
Rotation Time (s)	**0.5**	**0.5**	**0.6**
kV	**100**	**120**	**140**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(40-320)**	**(50-480)**	**(40-470)**
Manual mA	**200.0**	**240.0**	**270.0**
Noise Index	**14.0**	**16.0**	**20.5**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.5**	**2.5**	**2.5**

Series 2, Group 2, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**350/50**	**350/50**	**350/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option			
ASiR/ASiR256/DLIR	**40% / 20% / Low**	**40% / 20% / Low**	**40% / 20% / Low**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.5**	**2.5**	**2.5**
Recon 2 (Secondary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**350/50**	**350/50**	**350/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**40% / 20% / Low**	**40% / 20% / Low**	**40% / 20% / Low**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

CTA Abd-Liver - Triphasic 6.28/6.29/6.30

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Indication

Work-up of a potential liver transplant recipient.

Oral Contrast

Give a total 800 mL of water over the course of one hour prior to scan. Ask patient to drink slowly and steadily.

Give an additional 200mL dose of water on the CT scan table.

Pre-Scan Instructions

None

IV Contrast Parameters 350

Ulrich protocol 35

Patient Weight	Contrast Dosage	Injection Rate
All Adults	159 mL Iohexol 350 mgI/mL + 70 mL NaCl flush	5 mL/sec

IV Contrast Parameters 300/370

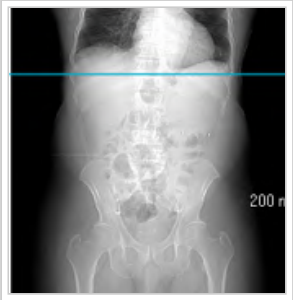
Patient Weight	Contrast Dosage	Injection Rate
All Adults	150 mL Iopamidol 370 mgI/mL (Isovue) + 70 mL NaCl flush	5 mL/sec

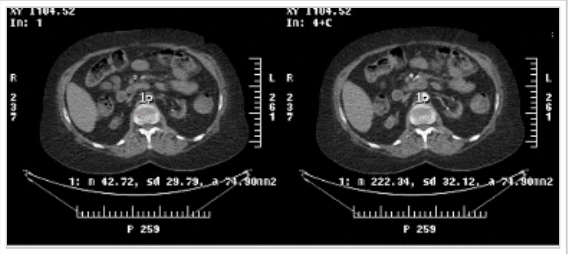
Field of View

Same as previous study or as small as appropriate

Scan Description

- Series 1 - PA & lateral scout: from diaphragm through iliac crest or pubic symphysis.
- Series 2 - Without IV contrast: (to localize) Start at the top of the liver and end at the bottom of the liver. Make sure the proximal SMA is on the scan.
- Series 3 (3 groups)
  - 1st group - Arterial Phase: Start scan just above the liver and end just below the bottom of the liver or proximal SMA which ever is lower.
  - 2nd group - Late Arterial Phase: Start scan just below the liver (same coordinates and table positions) and end just above the liver. This group is scanned bottom up.
  - 3rd group – Portal Venous Phase: 70 seconds after the start of the injection, start scan just above the liver and end at the iliac crests for the Abdomen or at pubic symphysis for the Abdomen/Pelvis
- Smart Prep - Monitor Phase - Place ROI on the aorta at the level of mid liver. **Dynamic transition is turned on so the scan will progress without the need for you to hit 'scan phase'.** Prep Group delays are pre-programmed for the Late Arterial and Portal venous phases.





- If doing a Chest with a Triphasic, **do not** include the chest with the abdomen groups (dose and scan speeds are not adequate). Perform the entire triphasic liver and then select the routine chest protocol as quickly as possible to get a delayed phase exam of the chest.

Reformat Instructions

See the table below.

In the United States, CT Angiography CPT codes require the performance and documentation of 3D angiographic rendering, which may include maximum intensity projection (MIP), volumetric rendering, and/or surface rendering techniques.

Reformats

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
SA BODY	THIN ST	DMPR	Average	350/50	3	2	sagittal
CO BODY	THIN ST	DMPR	Average	350/50	3	2	coronal

Networking

- All images are networked to PACS (ALI_Store).
- All thin 1.25mm series are auto-networked to CTAW1 3D lab.
- Note: if smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

Miscellaneous

None

Acquisition Parameters

Series 1, Scout

	Small	Medium	Large
Scout 1 kV	100	120	140
Scout 1 mA	10	10	10
Scout 1 Angle	180	180	180
Scout 2 kV	100	120	140
Scout 2 mA	40	40	80
Scout 2 Angle	90	90	90
WW/WL for Scout	500/50	500/50	500/50

Series 2, Scan Phase

	Small	Medium	Large
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**40**	**40**	**40**
Detector Rows	**64.0**	**64.0**	**64.0**
Detector Configuration	**64x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Large Body**	**Large Body**	**Large Body**
Pitch	**1.375**	**1.375**	**1.375**
Speed (mm/rot)	**55.00**	**55.00**	**55.00**
Rotation Time (s)	**0.5**	**0.5**	**0.5**
kV	**120**	**120**	**120**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(30-420)**	**(30-420)**	**(30-420)**
Manual mA	**150**	**150**	**150**
Noise Index	**25.0**	**25.0**	**25.0**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.5**	**2.5**	**2.5**

Series 2, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**350/50**	**350/50**	**350/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option			
ASiR/ASiR256/DLIR	**40% / 20% / Low**	**40% / 20% / Low**	**40% / 20% / Low**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.5**	**2.5**	**2.5**

Series 3, Smart Prep

	Small	Medium	Large
mA	**40**	**40**	**40**
Monitoring Delay (sec)	**10**	**10**	**10**
Monitoring ISD (sec)	**2**	**2**	**2**
Enhancement Threshold (HU)	**100**	**100**	**100**
Diagnostic Delay	**Auto Minimum**	**Auto Minimum**	**Auto Minimum**

Series 3, Group 1, Scan Phase

	Small	Medium	Large
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**40**	**40**	**40**
Detector Rows	**64.0**	**64.0**	**64.0**
Detector Configuration	**64x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Large Body**	**Large Body**	**Large Body**
Pitch	**0.516**	**0.516**	**0.516**
Speed (mm/rot)	**20.60**	**20.60**	**20.60**
Rotation Time (s)	**1**	**1**	**1**
kV	**80**	**100**	**120**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(50-410)**	**(50-480)**	**(50-515)**
Manual mA	**260.0**	**270.0**	**330.0**
Noise Index	**16.0**	**17.5**	**22.0**
Slice Thickness (mm)	**2.5**	**2.5**	**2.5**
Interval (mm)	**1.5**	**1.5**	**1.5**

Series 3, Group 1, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**350/50**	**350/50**	**350/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option			
ASiR/ASiR256/DLIR	**40% / 20% / Low**	**40% / 20% / Low**	**40% / 20% / Low**
Slice Thickness (mm)	**2.5**	**2.5**	**2.5**
Interval (mm)	**1.5**	**1.5**	**1.5**
Recon 2 (Secondary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**350/50**	**350/50**	**350/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**40% / 20% / Low**	**40% / 20% / Low**	**40% / 20% / Low**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Series 3, Group 2, Scan Phase

	Small	Medium	Large
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**40**	**40**	**40**
Detector Rows	**64.0**	**64.0**	**64.0**
Detector Configuration	**64x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Large Body**	**Large Body**	**Large Body**
Pitch	**0.984**	**0.984**	**0.984**
Speed (mm/rot)	**39.40**	**39.40**	**39.40**
Rotation Time (s)	**0.9**	**0.9**	**1**
kV	**80**	**100**	**120**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(45-360)**	**(45-470)**	**(40-450)**
Manual mA	**220.0**	**230.0**	**260.0**
Noise Index	**20.5**	**22.5**	**27.5**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.5**	**2.5**	**2.5**

Series 3, Group 2, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**350/50**	**350/50**	**350/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option			
ASiR/ASiR256/DLIR	**40% / 20% / Low**	**40% / 20% / Low**	**40% / 20% / Low**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.5**	**2.5**	**2.5**
Recon 2 (Secondary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**350/50**	**350/50**	**350/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**40% / 20% / Low**	**40% / 20% / Low**	**40% / 20% / Low**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Series 3, Group 3, Scan Phase

	Small	Medium	Large
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**40**	**40**	**40**
Detector Rows	**64.0**	**64.0**	**64.0**
Detector Configuration	**64x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Large Body**	**Large Body**	**Large Body**
Pitch	**0.984**	**0.984**	**0.984**
Speed (mm/rot)	**39.40**	**39.40**	**39.40**
Rotation Time (s)	**0.9**	**0.9**	**1**
kV	**80**	**100**	**120**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(45-360)**	**(45-470)**	**(40-450)**
Manual mA	**220.0**	**230.0**	**260.0**
Noise Index	**20.5**	**22.5**	**27.5**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.5**	**2.5**	**2.5**

Series 3, Group 3, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**350/50**	**350/50**	**350/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option			
ASiR/ASiR256/DLIR	**40% / 20% / Low**	**40% / 20% / Low**	**40% / 20% / Low**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.5**	**2.5**	**2.5**
Recon 2 (Secondary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**350/50**	**350/50**	**350/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**40% / 20% / Low**	**40% / 20% / Low**	**40% / 20% / Low**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Abd-Adrenal Gland - Adenoma 6.31/6.32/6.33

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Indication

Characterization for adrenal mass (For a pheochromocytoma do routine abdomen)

Video for this protocol

Oral Contrast

NONE. If converted to with IVC give a 200mL dose of water on the CT scan table while the IV is being placed.

Pre-Scan Instructions

None

IV Contrast Parameters 350

Select the Ulrich Weight-Based Adult 3mL protocol which will load the following settings: Saline Test Bolus 3mL/sec Weight based volume 3mL/sec (see below) Saline Flush 50 mL 3mL/sec

Iohexol (Omnipaque) 350 mg/mL injection at a rate of 3 mL/sec

For sites without the Ulrich use Medrad p3T or refer to the weight based contrast tables included with the protocol booklet.

IV Contrast Parameters 300/370

Medrad™ P3T Abdomen protocol.

Iohexol (Omnipaque) 300 mg/mL injection at a rate of 3 mL/sec

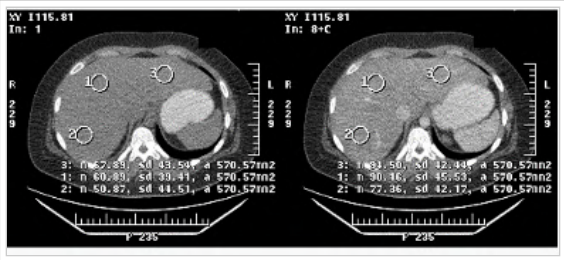
For sites without the Medrad™ P3T or P3T PA option, refer to the weight based contrast tables we provide in the protocol booklet.

Field of View

Same as previous study or as small as appropriate

Scan Description

- **Series 1** - PA & lateral scouts: from diaphragm through iliac crests or pubic symphysis.
- **Series 2** - Without IV contrast: Start at the top of the adrenal glands and end at the bottom of the adrenal glands. **Check this series with physician before performing series 3, 4 and 5**
- **Series 3** - Helical Scan with IV Contrast: Start scan just above the diaphragm, end scan at iliac crests. If pelvis is ordered, end scan just below pubic symphysis.
    - Smart Prep - Monitor Phase: Center over the liver. Put ROI (3) in the liver. Threshold 50 Hounsfield units. No more than 80 seconds delay.



- **Series 4** - Delayed Scan: Wait 15 minutes and then scan through the adrenal glands only.

Reformat Instructions

Use DirectMPR on Recon 2 for **BOTH** the non contrast and with contrast phases.

Reformats

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
SA BODY	THIN ST	DMPR	Average	350/50	3	2	sagittal
CO BODY	THIN ST	DMPR	Average	350/50	3	2	coronal

Networking

- All images are networked to PACS (ALI_Store).
- Note: If smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

Miscellaneous

None

Acquisition Parameters

Series 1, Scout

	Small	Medium	Large
Scout 1 kV	100	120	140
Scout 1 mA	10	10	10
Scout 1 Angle	180	180	180
Scout 2 kV	100	120	140
Scout 2 mA	40	40	80
Scout 2 Angle	90	90	90
WW/WL for Scout	500/50	500/50	500/50

Series 2, Scan Phase

	Small	Medium	Large
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**40**	**40**	**40**
Detector Rows	**64.0**	**64.0**	**64.0**
Detector Configuration	**64x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Large Body**	**Large Body**	**Large Body**
Pitch	**0.516**	**0.516**	**0.516**
Speed (mm/rot)	**20.60**	**20.60**	**20.60**
Rotation Time (s)	**0.5**	**0.7**	**0.9**
kV	**120**	**120**	**120**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(45-370)**	**(50-490)**	**(45-520)**
Manual mA	**230.0**	**250.0**	**300.0**
Noise Index	**9.5**	**13.5**	**20.0**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.5**	**2.5**	**2.5**

Series 2, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**350/50**	**350/50**	**350/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option			
ASiR/ASiR256/DLIR	**40% / 20% / Low**	**40% / 20% / Low**	**40% / 20% / Low**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.5**	**2.5**	**2.5**
Recon 2 (Secondary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**350/50**	**350/50**	**350/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**40% / 20% / Low**	**40% / 20% / Low**	**40% / 20% / Low**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Series 3, Smart Prep

	Small	Medium	Large
mA	**40**	**40**	**40**
Monitoring Delay (sec)	**40**	**40**	**40**
Monitoring ISD (sec)	**3**	**3**	**3**
Enhancement Threshold (HU)	**50**	**50**	**50**
Diagnostic Delay	**Auto Minimum**	**Auto Minimum**	**Auto Minimum**

Series 3, Scan Phase

	Small	Medium	Large
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**40**	**40**	**40**
Detector Rows	**64.0**	**64.0**	**64.0**
Detector Configuration	**64x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Large Body**	**Large Body**	**Large Body**
Pitch	**0.516**	**0.516**	**0.516**
Speed (mm/rot)	**20.60**	**20.60**	**20.60**
Rotation Time (s)	**0.5**	**0.5**	**0.6**
kV	**120**	**120**	**120**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(30-260)**	**(50-480)**	**(45-540)**
Manual mA	**160.0**	**240.0**	**310.0**
Noise Index	**11.5**	**16.0**	**24.0**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.5**	**2.5**	**2.5**

Series 3, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**350/50**	**350/50**	**350/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option			
ASiR/ASiR256/DLIR	**40% / 20% / Low**	**40% / 20% / Low**	**40% / 20% / Low**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.5**	**2.5**	**2.5**
Recon 2 (Secondary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**350/50**	**350/50**	**350/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**40% / 20% / Low**	**40% / 20% / Low**	**40% / 20% / Low**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Series 4, Scan Phase

	Small	Medium	Large
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**40**	**40**	**40**
Detector Rows	**64.0**	**64.0**	**64.0**
Detector Configuration	**64x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Large Body**	**Large Body**	**Large Body**
Pitch	**0.516**	**0.516**	**0.516**
Speed (mm/rot)	**20.60**	**20.60**	**20.60**
Rotation Time (s)	**0.5**	**0.5**	**0.6**
kV	**120**	**120**	**120**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(30-260)**	**(50-480)**	**(45-540)**
Manual mA	**160.0**	**240.0**	**310.0**
Noise Index	**11.5**	**16.0**	**24.0**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.5**	**2.5**	**2.5**

Series 4, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**350/50**	**350/50**	**350/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option			
ASiR/ASiR256/DLIR	**40% / 20% / Low**	**40% / 20% / Low**	**40% / 20% / Low**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.5**	**2.5**	**2.5**

Abd - Pancreas Cancer (Neoplasm Screening) 6.40/6.41/6.42

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Indication

Suspicion of pancreatic neoplasm. Use this protocol if patient has already had pancreatic neoplasm CTA.

Preoperative evaluation of known pancreatic neoplasm.

Video for this protocol

Oral Contrast

Give a total 800 mL of water over the course of one hour prior to scan. Ask patient to drink slowly and steadily.

Give an additional 200mL dose of water on the CT scan table.

Pre-Scan Instructions

None

IV Contrast Parameter 350

Select the Ulrich Weight-Based Adult 3mL protocol which will load the following settings: Saline Test Bolus 3mL/sec Weight based volume 3mL/sec (see below) Saline Flush 50 mL 3mL/sec

Iohexol (Omnipaque) 350 mg/mL injection at a rate of 3 mL/sec

For sites without the Ulrich use Medrad p3T or refer to the weight based contrast tables included with the protocol booklet.

IV Contrast Parameters 300/370

Medrad™ P3T Abdomen protocol.

Iohexol (Omnipaque) 300 mg/mL injection at a rate of 3 mL/sec

For sites without the Medrad™ P3T or P3T PA option, refer to the weight based contrast tables we provide in the protocol booklet.

Field of View

Same as previous study or as small as appropriate

Scan Description

- Series 1 - A/P & lateral scouts - Diaphragm through Iliac crest.
- Series 2 With IV Contrast (This is performed in 2 groups.)
    - NO SMART PREP NEEDED - Start 40 seconds after the start of the injection. (If patient appears ill, then SMART PREP over the liver; put ROI in the aorta - begin 20 sec. after contrast is seen in the aorta. This

delay is built into the diagnostic delay of smart prep.)

- 1st group: With IV Contrast: Start at the top of the liver and end at the iliac crest.
- 2nd group: Portal phase: 70 secs after injection, start at the top of the liver and end at the iliac crest for the abdomen only or the pubic symphysis if a pelvis is ordered.

Reformat Instructions

Use DMPR on THIN ST.

Reformats

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
SA BODY	THIN ST	DMPR	Average	350/50	3	2	sagittal
CO BODY	THIN ST	DMPR	Average	350/50	3	2	coronal

Networking

- Chest scan send all series to PACS (ALI_Store) including the Dose Information Slide.
- All body images are networked to PACS (ALI_Store).
- Note: if smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

Miscellaneous

None

Acquisition Parameters

Series 1, Scout

	Small	Medium	Large
Scout 1 kV	100	120	140
Scout 1 mA	10	10	10
Scout 1 Angle	180	180	180
Scout 2 kV	100	120	140
Scout 2 mA	40	40	80
Scout 2 Angle	90	90	90
WW/WL for Scout	500/50	500/50	500/50

Series 2, Group 1, Scan Phase

	Small	Medium	Large
Scan Type	Helical	Helical	Helical
Beam Collimation	40	40	40
Detector Rows	64.0	64.0	64.0
Detector Configuration	64x0.625	64x0.625	64x0.625
Scan FOV	Large Body	Large Body	Large Body
Pitch	0.516	0.516	0.516
Speed (mm/rot)	20.60	20.60	20.60
Rotation Time (s)	0.6	0.8	1
kV	100	120	140
AEC type	smart mA	smart mA	smart mA
mA Range	(60-470)	(50-530)	(45-500)
Manual mA	300.0	270.0	280.0
Noise Index	13.0	14.5	19.0
Slice Thickness (mm)	2.5	2.5	2.5
Interval (mm)	1.5	1.5	1.5

Series 2, Group 1, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**350/50**	**350/50**	**350/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option			
ASiR/ASiR256/DLIR	**40% / 20% / Low**	**40% / 20% / Low**	**40% / 20% / Low**
Slice Thickness (mm)	**2.5**	**2.5**	**2.5**
Interval (mm)	**1.5**	**1.5**	**1.5**
Recon 2 (Secondary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**350/50**	**350/50**	**350/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**40% / 20% / Low**	**40% / 20% / Low**	**40% / 20% / Low**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Series 2, Group 2, Scan Phase

	Small	Medium	Large
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**40**	**40**	**40**
Detector Rows	**64.0**	**64.0**	**64.0**
Detector Configuration	**64x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Large Body**	**Large Body**	**Large Body**
Pitch	**0.516**	**0.516**	**0.516**
Speed (mm/rot)	**20.60**	**20.60**	**20.60**
Rotation Time (s)	**0.5**	**0.7**	**0.8**
kV	**100**	**120**	**140**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(60-460)**	**(50-490)**	**(45-500)**
Manual mA	**290.0**	**250.0**	**290.0**
Noise Index	**11.5**	**13.5**	**17.0**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.5**	**2.5**	**2.5**

Series 2, Group 2, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**350/50**	**350/50**	**350/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option			
ASiR/ASiR256/DLIR	**40% / 20% / Low**	**40% / 20% / Low**	**40% / 20% / Low**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.5**	**2.5**	**2.5**
Recon 2 (Secondary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**350/50**	**350/50**	**350/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**40% / 20% / Low**	**40% / 20% / Low**	**40% / 20% / Low**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Abd/Pelvis - Kidney Tumor 6.49/6.50/6.51

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Indication

Suspicion or evaluation of small renal neoplasm. Ideal for PCKD (unless contrast is contraindicated, in which case use the Flank Pain protocol).

Video for this protocol

Oral Contrast

Give a total 800 mL of water over the course of one hour prior to scan. Ask patient to drink slowly and steadily.

Give an additional 200mL dose of water on the CT scan table.

Pre-Scan Instructions

None

IV Contrast Parameters 350

Select the Ulrich Weight-Based Adult 3mL protocol which will load the following settings: Saline Test Bolus 3mL/sec Weight based volume 3mL/sec (see below) Saline Flush 50 mL 3mL/sec

Iohexol (Omnipaque) 350 mg/mL injection at a rate of 3 mL/sec

For sites without the Ulrich use Medrad p3T or refer to the weight based contrast tables included with the protocol booklet.

IV Contrast Parameters 300/370

Medrad™ P3T Abdomen protocol.

Iohexol (Omnipaque) 300 mg/mL injection at a rate of 3 mL/sec

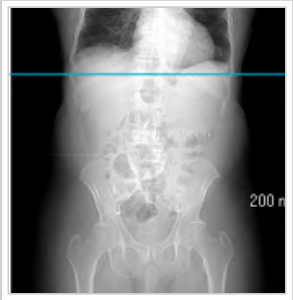
For sites without the Medrad™ P3T or P3T PA option, refer to the weight based contrast tables we provide in the protocol booklet.

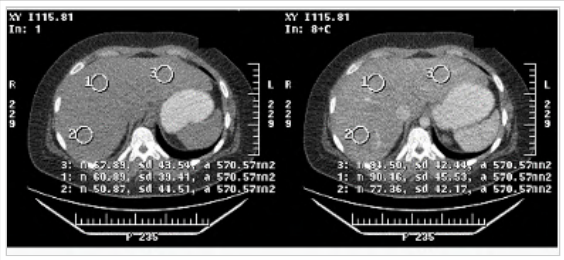
Field of View

Same as previous study or as small as appropriate

Scan Description

- **Series 1** - PA and lateral scouts: from diaphragm through iliac crest or pubic symphysis if pelvis is ordered.
- **Series 2** – Without IV contrast: Start at the top of the kidneys and end at the bottom of the kidneys. Approximate levels of T10 – L3.
- **Series 3**- With contrast: Start at the top of the diaphragm, for Abdomen only end at the iliac crest or for Abdomen/Pelvis end at pubic symphysis
    - Smart Prep- Monitor Phase: Center over the liver. Put ROI (3) in the liver. Threshold of 70 Hounsfield units. No less than 60 and no more than 80 second delay.





- **Series 4** - 2 minute delayed sequence through kidneys only

Reformat Instructions

Use DMPR on THIN ST.

Reformats

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
SA BODY	THIN ST	DMPR	Average	350/50	3	2	sagittal
CO BODY	THIN ST	DMPR	Average	350/50	3	2	coronal

Networking

- Chest scan send all series to PACS (ALI_Store) including the Dose Information Slide.
- All body images are networked to PACS (ALI_Store).
- Note: if smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

Miscellaneous

None

Acquisition Parameters

Series 1, Scout

	Small	Medium	Large
Scout 1 kV	100	120	140
Scout 1 mA	10	10	10
Scout 1 Angle	180	180	180
Scout 2 kV	100	120	140
Scout 2 mA	40	40	80
Scout 2 Angle	90	90	90
WW/WL for Scout	500/50	500/50	500/50

Series 2, Scan Phase

	Small	Medium	Large
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**40**	**40**	**40**
Detector Rows	**64.0**	**64.0**	**64.0**
Detector Configuration	**64x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Large Body**	**Large Body**	**Large Body**
Pitch	**0.984**	**0.984**	**0.984**
Speed (mm/rot)	**39.40**	**39.40**	**39.40**
Rotation Time (s)	**0.5**	**0.5**	**0.6**
kV	**100**	**120**	**140**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(45-340)**	**(50-520)**	**(45-500)**
Manual mA	**210.0**	**260.0**	**290.0**
Noise Index	**18.5**	**21.5**	**27.5**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.5**	**2.5**	**2.5**

Series 2, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**350/50**	**350/50**	**350/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option			
ASiR/ASiR256/DLIR	**40% / 20% / Low**	**40% / 20% / Low**	**40% / 20% / Low**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.5**	**2.5**	**2.5**

Series 3, Smart Prep

	Small	Medium	Large
mA	**40**	**40**	**40**
Monitoring Delay (sec)	**40**	**40**	**40**
Monitoring ISD (sec)	**3**	**3**	**3**
Enhancement Threshold (HU)	**50**	**50**	**50**
Diagnostic Delay	**Auto Minimum**	**Auto Minimum**	**Auto Minimum**

Series 3, Scan Phase

	Small	Medium	Large
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**40**	**40**	**40**
Detector Rows	**64.0**	**64.0**	**64.0**
Detector Configuration	**64x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Large Body**	**Large Body**	**Large Body**
Pitch	**0.516**	**0.516**	**0.516**
Speed (mm/rot)	**20.60**	**20.60**	**20.60**
Rotation Time (s)	**0.5**	**0.5**	**0.6**
kV	**100**	**120**	**140**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(40-320)**	**(50-480)**	**(40-470)**
Manual mA	**200.0**	**240.0**	**270.0**
Noise Index	**14.0**	**16.0**	**20.5**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.5**	**2.5**	**2.5**

Series 3, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**350/50**	**350/50**	**350/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option			
ASiR/ASiR256/DLIR	**40% / 20% / Low**	**40% / 20% / Low**	**40% / 20% / Low**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.5**	**2.5**	**2.5**
Recon 2 (Secondary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**350/50**	**350/50**	**350/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**40% / 20% / Low**	**40% / 20% / Low**	**40% / 20% / Low**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Series 4, Scan Phase

	Small	Medium	Large
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**40**	**40**	**40**
Detector Rows	**64.0**	**64.0**	**64.0**
Detector Configuration	**64x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Large Body**	**Large Body**	**Large Body**
Pitch	**0.516**	**0.516**	**0.516**
Speed (mm/rot)	**20.60**	**20.60**	**20.60**
Rotation Time (s)	**0.5**	**0.7**	**0.8**
kV	**100**	**120**	**140**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(60-460)**	**(50-490)**	**(45-500)**
Manual mA	**290.0**	**250.0**	**290.0**
Noise Index	**11.5**	**13.5**	**17.0**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.5**	**2.5**	**2.5**

Series 4, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**350/50**	**350/50**	**350/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option			
ASiR/ASiR256/DLIR	**40% / 20% / Low**	**40% / 20% / Low**	**40% / 20% / Low**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.5**	**2.5**	**2.5**

CTA Abd - Renal Donor 6.52/6.53/6.54

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Indication

- Work-up of a potential renal donor.
- Assess for renal auto transplant.

Video for this protocol

Oral Contrast

Give a total 800 mL of water over the course of one hour prior to scan. Ask patient to drink slowly and steadily.

Have patient void before bringing patient into the scanner.

Give an additional 200mL dose of water on the CT scan table.

Pre-Scan Instructions

None

IV Contrast Parameters 350

Select Ulrich protocol 36

Load: 159 mL Iohexol 350 mgI/mL + 90 mL NaCl Flush

1. Scan without series
2. Start Renal Donor Injection Part 1
3. Wait 5 minutes _ cannot be done on the injector. Stopwatch on injector will not start until after start of 'Part Two'/multi-phase injection.
4. Start Renal Donor Injection Part 2 and CT With Contrast series simultaneously, there is a Prep Group Delay of 70 seconds built in to the protocol.

2 Part, Multi-Phase Injection	Contrast Dosage	Injection Rate
Injection Part 1	21 mL Iohexol 350 mgI/mL + 20 mL NaCl flush	5 mL/sec
Wait 5 Minutes then Start Multi-Phase Injection		
Injection Part 2, Phase 1	32 mL Iohexol 350 mgI/mL + 30 mL NaCl flush	3 mL/sec
Pause 20 seconds		
Injection Part 2, Phase 2	106 mL Iohexol 350 mgI/mL + 50 mL NaCl flush	5 mL/sec
18 G Antecubital IV		

IV Contrast Parameters 300/370

Load: 150 mL Iopamidol 370 mgI/mL (Isovue) + 90 mL NaCl Flush

1. Scan without series
2. Start Renal Donor Injection Part 1
3. Wait 5 minutes
4. Start Renal Donor Injection Part 2 and CT With Contrast series simultaneously, there is a Prep Group Delay of 70 seconds built in to the protocol.

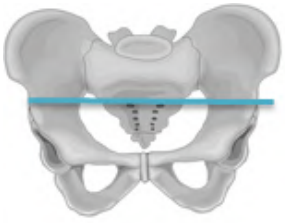
2 Part, Multi-Phase Injection	Contrast Dosage	Injection Rate
Injection Part 1	20 mL Iopamidol 370 mgI/mL (Isovue) + 20 mL NaCl flush	5 mL/sec
Wait 5 Minutes then Start Multi-Phase Injection		
Injection Part 2, Phase 1	30 mL Iopamidol 370 mgI/mL (Isovue) + 30 mL NaCl flush	3 mL/sec
Pause 20 seconds		
Injection Part 2, Phase 2	100 mL Iopamidol 370 mgI/mL (Isovue) + 50 mL NaCl flush	5 mL/sec
18 G Antecubital IV		

Field of View

Same as previous study or as small as appropriate

Scan Description

- **Series 1** - PA and lateral scouts: from diaphragm to the bottom of the SI joints.
- **Series 2** - Without IV contrast: Through kidneys; approximate levels T12 – L4 to R/O calculi.
- Inject: **Using Renal Donor Part 1 injection protocol. Wait 5 minutes**.
- **Series 3** - Vascular Phase: Start at the top of the kidneys and end just below the SI Joints. Start the multi-phase injection, **using renal donor part 2 injection protocol** and the scan at the same time, there is a 70sec delay built in.



- **Series 4** – Parenchymal phase: Begin scan 3 min from start of multi-phase injection. Start at the top of liver and end at the iliac crest. For **Auto Transplant** - please scan through pelvis on 3-minute delays.

Reformat Instructions

Use DMPR on THIN ST.

In the United States, CT Angiography CPT codes require the performance and documentation of 3D angiographic rendering, which may include maximum intensity projection (MIP), volumetric rendering, and/or surface rendering techniques.

Reformats

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
SA BODY	THIN ST	DMPR	Average	350/50	3	2	sagittal
CO BODY	THIN ST	DMPR	Average	350/50	3	2	coronal

Networking

All images are networked to PACS (ALI_Store).

Miscellaneous

None

Acquisition Parameters

Series 1, Scout

	Small	Medium	Large
Scout 1 kV	**100**	**120**	**140**
Scout 1 mA	**10**	**10**	**10**
Scout 1 Angle	**180**	**180**	**180**
Scout 2 kV	**100**	**120**	**140**
Scout 2 mA	**40**	**40**	**80**
Scout 2 Angle	**90**	**90**	**90**
WW/WL for Scout	**500/50**	**500/50**	**500/50**

Series 2, Scan Phase

	Small	Medium	Large
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**40**	**40**	**40**
Detector Rows	**64.0**	**64.0**	**64.0**
Detector Configuration	**64x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Large Body**	**Large Body**	**Large Body**
Pitch	**0.984**	**0.984**	**0.984**
Speed (mm/rot)	**39.40**	**39.40**	**39.40**
Rotation Time (s)	**0.5**	**0.5**	**0.6**
kV	**100**	**120**	**140**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(45-340)**	**(50-520)**	**(45-500)**
Manual mA	**210.0**	**260.0**	**290.0**
Noise Index	**18.5**	**21.5**	**27.5**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.5**	**2.5**	**2.5**

Series 2, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**350/50**	**350/50**	**350/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option			
ASiR/ASiR256/DLIR	**40% / 20% / Low**	**40% / 20% / Low**	**40% / 20% / Low**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.5**	**2.5**	**2.5**

Series 3, Scan Phase

	Small	Medium	Large
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**40**	**40**	**40**
Detector Rows	**64.0**	**64.0**	**64.0**
Detector Configuration	**64x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Large Body**	**Large Body**	**Large Body**
Pitch	**0.516**	**0.516**	**0.516**
Speed (mm/rot)	**20.60**	**20.60**	**20.60**
Rotation Time (s)	**1**	**1**	**1**
kV	**80**	**100**	**120**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(50-410)**	**(50-480)**	**(50-515)**
Manual mA	**260.0**	**270.0**	**330.0**
Noise Index	**23.0**	**25.0**	**31.0**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Series 3, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**350/50**	**350/50**	**350/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**40% / 20% / Low**	**40% / 20% / Low**	**40% / 20% / Low**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Series 4, Scan Phase

	Small	Medium	Large
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**40**	**40**	**40**
Detector Rows	**64.0**	**64.0**	**64.0**
Detector Configuration	**64x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Large Body**	**Large Body**	**Large Body**
Pitch	**0.516**	**0.516**	**0.516**
Speed (mm/rot)	**20.60**	**20.60**	**20.60**
Rotation Time (s)	**0.6**	**0.7**	**0.7**
kV	**80**	**100**	**120**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(50-380)**	**(45-430)**	**(40-460)**
Manual mA	**240.0**	**210.0**	**260.0**
Noise Index	**17.5**	**19.0**	**24.0**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.5**	**2.5**	**2.5**

Series 4, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**350/50**	**350/50**	**350/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option			
ASiR/ASiR256/DLIR	**40% / 20% / Low**	**40% / 20% / Low**	**40% / 20% / Low**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.5**	**2.5**	**2.5**
Recon 2 (Secondary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**350/50**	**350/50**	**350/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**40% / 20% / Low**	**40% / 20% / Low**	**40% / 20% / Low**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Abd-Small Bowel Enterography 6.55/6.56/6.57

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Indication

Evaluate for small bowel disease.

Video for this protocol

Oral Contrast

Breeza = Give a total dose of 1,500 mL (3 bottles total).

Give the first bottle of Breeza (500 mL) over 15 minutes, the second bottle (500 mL) over the next 15 minutes and then the third bottle (500 mL) over the last 30 minutes. The total drinking time equals 1 hour.

Give an additional 200mL dose of water on the CT scan table. No Positive Oral Contrast.

Pre-Scan Instructions

None

IV Contrast Parameters 350

Select Ulrich Weight-Based Angio Body protocols 38-44

Iohexol 350 mgI/ml (Isovue) injection

For sites without the Ulrich, use Medrad™ P3T PA option, or refer to the weight based contrast tables we provide in the protocol booklet.

IV Contrast Parameters 300/370

Medrad™ P3T PA protocol

To set up P3T= choose P3T, Thorax, PA then click on ok. Confirm contrast and load fluids. Enter scan duration and click ok.

Iopamidol 370 mgI/ml (Isovue) injection

For sites without the Medrad™ P3T or P3T PA option, refer to the weight based contrast tables we provide in the protocol booklet.

Field of View

Same as previous study or as small as appropriate

Scan Description

- Series 1 - PA and lateral scouts: from diaphragm through pubic symphysis
- Series 2 - Portal phase: 55 seconds after injection, start at the diaphragm and end at the pubic symphysis.

Reformat Instructions

Use DMPR on THIN ST.

Reformats

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
SA BODY	THIN ST	DMPR	Average	350/50	3	2	sagittal
CO BODY	THIN ST	DMPR	Average	350/50	3	2	coronal

Networking

- Chest scan send all series to PACS (ALI_Store) including the Dose Information Slide.
- All body images are networked to PACS (ALI_Store).
- Note: if smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

Miscellaneous

None

Acquisition Parameters

Series 1, Scout

	Small	Medium	Large
Scout 1 kV	100	120	140
Scout 1 mA	10	10	10
Scout 1 Angle	180	180	180
Scout 2 kV	100	120	140
Scout 2 mA	40	40	80
Scout 2 Angle	90	90	90
WW/WL for Scout	500/50	500/50	500/50

Series 2, Scan Phase

	Small	Medium	Large
Scan Type	Helical	Helical	Helical
Beam Collimation	40	40	40
Detector Rows	64.0	64.0	64.0
Detector Configuration	64x0.625	64x0.625	64x0.625
Scan FOV	Large Body	Large Body	Large Body
Pitch	0.516	0.516	0.516
Speed (mm/rot)	20.60	20.60	20.60
Rotation Time (s)	0.5	0.7	0.8
kV	100	120	140
AEC type	smart mA	smart mA	smart mA
mA Range	(60-460)	(50-490)	(45-500)
Manual mA	290.0	250.0	290.0
Noise Index	14.5	16.5	21.0
Slice Thickness (mm)	2.5	2.5	2.5
Interval (mm)	1.5	1.5	1.5

Series 2, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**350/50**	**350/50**	**350/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option			
ASiR/ASiR256/DLIR	**40% / 20% / Low**	**40% / 20% / Low**	**40% / 20% / Low**
Slice Thickness (mm)	**2.5**	**2.5**	**2.5**
Interval (mm)	**1.5**	**1.5**	**1.5**
Recon 2 (Secondary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**350/50**	**350/50**	**350/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**40% / 20% / Low**	**40% / 20% / Low**	**40% / 20% / Low**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

CTA Abd - Obscure GI Bleed 6.58/6.59/6.60

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Indication

Evaluate for cause of obscure gastrointestinal bleed.

Video for this protocol

Oral Contrast

Breeza = Give a total dose of 1,500 mL (3 bottles total).

Give the first bottle of Breeza (500 mL) over 15 minutes, the second bottle (500 mL) over the next 15 minutes and then the third bottle (500 mL) over the last 30 minutes. The total drinking time equals 1 hour.

Give an additional 200mL dose of water on the CT scan table. No Positive Oral Contrast.

Pre-Scan Instructions

None

IV Contrast Parameters 350

Select Ulrich protocol 37

Obscure GI Bleed, multi-phase injection:

Injection Phase	Contrast Dosage	Injection Rate
Phase 1	32 mL Iohexol 350 mgI/mL + 30 mL NaCl flush	3 mL/sec
Pause 10 Seconds		
Phase 2	106 mL Iohexol 350 mgI/mL + 50 mL NaCl flush	5 mL/sec
18 G Antecubital IV		

IV Contrast Parameters 300/370

Obscure GI Bleed, multi-phase injection:

Injection Phase	Contrast Dosage	Injection Rate
Phase 1	30 mL Iopamidol 370 mgI/mL (Isovue) + 30 mL NaCl flush	3 mL/sec
Pause 10 Seconds		
Phase 2	100 mL Iopamidol 370 mgI/mL (Isovue) + 50 mL NaCl flush	5 mL/sec
18 G Antecubital IV		

Field of View

Same as previous study or as small as appropriate

Scan Description

- Series 1 - PA and lateral scouts: from diaphragm through pubic symphysis.
- Series 2 - Without IV contrast: From diaphragm to pubic symphysis.
- Series 3 - Vascular Phase: From diaphragm to pubic symphysis. Start the multi-phase injection and the scan at the same time; the scan will have a 60 sec delay built in so that scan acquisition will begin at 60 sec after the

start of the multi-phase injection.
- Series 4 – Delayed phase: Begin scan 3 min from start of multi-phase injection. From diaphragm to pubic symphysis.

Reformat Instructions

Use DMPR on THIN ST.

In the United States, CT Angiography CPT codes require the performance and documentation of 3D angiographic rendering, which may include maximum intensity projection (MIP), volumetric rendering, and/or surface rendering techniques.

Reformats

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
SA BODY	Vascular phase THIN ST	DMPR	Average	350/50	3	2	Sagittal
CO BODY	Vascular phase THIN ST	DMPR	Average	350/50	3	2	Coronal
SA BODY	Vascular phase THIN ST	Manual	MIP	350/50	10	5	Sagittal
SA BODY	Delayed phase THIN ST	DMPR	Average	350/50	3	2	Sagittal
CO BODY	Delayed phase THIN ST	DMPR	Average	350/50	3	2	Coronal

Networking

- All images are networked to PACS (ALI_Store).
- Thin 1.25 mm images are auto- networked to CTAW1/3D Lab.
- If there is a chest scanned send all images networked to PACS (ALI_Store).
- Note: if smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

Miscellaneous

None

Acquisition Parameters

Series 1, Scout

	Small	Medium	Large
Scout 1 kV	100	120	140
Scout 1 mA	10	10	10
Scout 1 Angle	180	180	180
Scout 2 kV	100	120	140
Scout 2 mA	40	40	80
Scout 2 Angle	90	90	90
WW/WL for Scout	500/50	500/50	500/50

Series 2, Scan Phase

	Small	Medium	Large
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**40**	**40**	**40**
Detector Rows	**64.0**	**64.0**	**64.0**
Detector Configuration	**64x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Large Body**	**Large Body**	**Large Body**
Pitch	**0.984**	**0.984**	**0.984**
Speed (mm/rot)	**39.40**	**39.40**	**39.40**
Rotation Time (s)	**0.5**	**0.5**	**0.6**
kV	**100**	**120**	**140**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(45-340)**	**(50-520)**	**(45-500)**
Manual mA	**210.0**	**260.0**	**290.0**
Noise Index	**18.5**	**21.5**	**27.5**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.5**	**2.5**	**2.5**

Series 2, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**350/50**	**350/50**	**350/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option			
ASiR/ASiR256/DLIR	**40% / 20% / Low**	**40% / 20% / Low**	**40% / 20% / Low**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.5**	**2.5**	**2.5**

Series 3, Scan Phase

	Small	Medium	Large
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**40**	**40**	**40**
Detector Rows	**64.0**	**64.0**	**64.0**
Detector Configuration	**64x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Large Body**	**Large Body**	**Large Body**
Pitch	**0.516**	**0.516**	**0.516**
Speed (mm/rot)	**20.60**	**20.60**	**20.60**
Rotation Time (s)	**1**	**1**	**1**
kV	**80**	**100**	**120**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(50-400)**	**(50-480)**	**(50-515)**
Manual mA	**260.0**	**270.0**	**330.0**
Noise Index	**13.5**	**14.5**	**18.0**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.5**	**2.5**	**2.5**

Series 3, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**350/50**	**350/50**	**350/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option			
ASiR/ASiR256/DLIR	**40% / 20% / Low**	**40% / 20% / Low**	**40% / 20% / Low**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.5**	**2.5**	**2.5**
Recon 2 (Secondary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**350/50**	**350/50**	**350/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**40% / 20% / Low**	**40% / 20% / Low**	**40% / 20% / Low**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Series 4, Scan Phase

	Small	Medium	Large
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**40**	**40**	**40**
Detector Rows	**64.0**	**64.0**	**64.0**
Detector Configuration	**64x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Large Body**	**Large Body**	**Large Body**
Pitch	**0.984**	**0.984**	**0.984**
Speed (mm/rot)	**39.40**	**39.40**	**39.40**
Rotation Time (s)	**0.9**	**0.9**	**1**
kV	**80**	**100**	**120**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(45-360)**	**(45-470)**	**(40-450)**
Manual mA	**220.0**	**230.0**	**260.0**
Noise Index	**20.5**	**22.5**	**27.5**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.5**	**2.5**	**2.5**

Series 4, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**350/50**	**350/50**	**350/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option			
ASiR/ASiR256/DLIR	**40% / 20% / Low**	**40% / 20% / Low**	**40% / 20% / Low**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.5**	**2.5**	**2.5**
Recon 2 (Secondary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**350/50**	**350/50**	**350/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**40% / 20% / Low**	**40% / 20% / Low**	**40% / 20% / Low**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

CTA Abd - Mesenteric Ischemia 6.61/6.62/6.63

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Indication

Evaluate for mesenteric ischemia.

Video for this protocol

Oral Contrast

Give a total 400 mL of water prior to scan (A 200mL dose every 15 minutes over 30 minutes).

Give an additional 200mL dose of water on the CT scan table.

Pre-Scan Instructions

None

IV Contrast Parameters 350

Select Ulrich Weight-Based Angio Body protocols 38-44

Iohexol 350 mgI/ml (Isovue) injection

For sites without the Ulrich, use Medrad™ P3T PA option, or refer to the weight based contrast tables we provide in the protocol booklet.

IV Contrast Parameters 300/370

Medrad™ P3T PA protocol

To set up P3T= choose P3T, Thorax, PA then click on ok. Confirm contrast and load fluids. Enter scan duration and click ok.

Iopamidol 370 mgI/ml (Isovue) injection

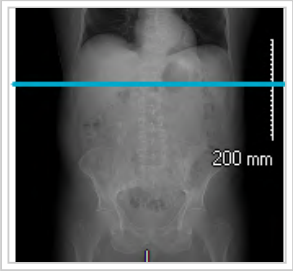
For sites without the Medrad™ P3T or P3T PA option, refer to the weight based contrast tables we provide in the protocol booklet.

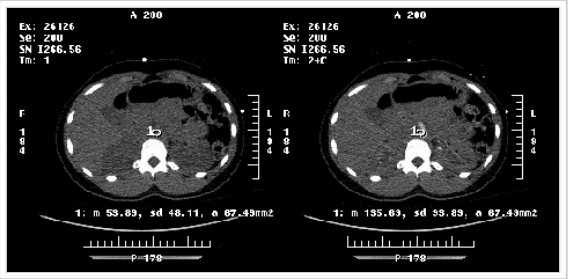
Field of View

Same as previous study or as small as appropriate

Scan Description

- Series 1 - PA and lateral scouts: from diaphragm through pubic symphysis
- Series 2 - Helical scan performed in 2 groups
  - 1st Group: Arterial phase: Start scan just above the diaphragm and end at the level of the femoral heads.
  - 2nd Group: Portal Venous phase: Scanned at 70 seconds after injection. Adjust Prep Group delay to achieve this. Start just above the diaphragm and end at the pubic symphysis.
    - Smart prep-Monitor Phase: at the level of the celiac on the aorta. **Dynamic transition is turned on so the scan will progress without the need for you to hit 'scan phase'.**





Reformat Instructions

Use DMPR on THIN ST.

In the United States, CT Angiography CPT codes require the performance and documentation of 3D angiographic rendering, which may include maximum intensity projection (MIP), volumetric rendering, and/or surface rendering techniques.

Reformats

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
SA BODY	THIN ST	DMPR	Average	350/50	3	2	sagittal
CO BODY	THIN ST	DMPR	Average	350/50	3	2	coronal

Networking

- All images are networked to PACS (ALI_Store).
- Thin 1.25 mm images are auto- networked to CTAW1/3D Lab.
- If there is a chest scanned send all images networked to PACS (ALI_Store).
- Note: if smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

Miscellaneous

None

Acquisition Parameters

Series 1, Scout

	Small	Medium	Large
Scout 1 kV	100	120	140
Scout 1 mA	10	10	10
Scout 1 Angle	180	180	180
Scout 2 kV	100	120	140
Scout 2 mA	40	40	80
Scout 2 Angle	90	90	90
WW/WL for Scout	500/50	500/50	500/50

Series 2, Smart Prep

	Small	Medium	Large
mA	40	40	40
Monitoring Delay (sec)	10	10	10
Monitoring ISD (sec)	3	3	3
Enhancement Threshold (HU)	100	100	100
Diagnostic Delay	Auto Minimum	Auto Minimum	Auto Minimum

Series 2, Group 1, Scan Phase

	Small	Medium	Large
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**40**	**40**	**40**
Detector Rows	**64.0**	**64.0**	**64.0**
Detector Configuration	**64x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Large Body**	**Large Body**	**Large Body**
Pitch	**0.516**	**0.516**	**0.516**
Speed (mm/rot)	**20.60**	**20.60**	**20.60**
Rotation Time (s)	**1**	**1**	**1**
kV	**80**	**100**	**120**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(50-410)**	**(50-480)**	**(50-515)**
Manual mA	**260.0**	**270.0**	**330.0**
Noise Index	**23.0**	**25.0**	**31.0**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Series 2, Group 1, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**350/50**	**350/50**	**350/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**40% / 20% / Low**	**40% / 20% / Low**	**40% / 20% / Low**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Series 2, Group 2, Scan Phase

	Small	Medium	Large
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**40**	**40**	**40**
Detector Rows	**64.0**	**64.0**	**64.0**
Detector Configuration	**64x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Large Body**	**Large Body**	**Large Body**
Pitch	**0.516**	**0.516**	**0.516**
Speed (mm/rot)	**20.60**	**20.60**	**20.60**
Rotation Time (s)	**0.5**	**0.5**	**0.6**
kV	**100**	**120**	**140**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(40-320)**	**(50-480)**	**(40-470)**
Manual mA	**200.0**	**240.0**	**270.0**
Noise Index	**14.0**	**16.0**	**20.5**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.5**	**2.5**	**2.5**

Series 2, Group 2, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**350/50**	**350/50**	**350/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option			
ASiR/ASiR256/DLIR	**40% / 20% / Low**	**40% / 20% / Low**	**40% / 20% / Low**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.5**	**2.5**	**2.5**
Recon 2 (Secondary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**350/50**	**350/50**	**350/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**40% / 20% / Low**	**40% / 20% / Low**	**40% / 20% / Low**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Urothelial Tumor Follow-up 6.70/6.71/6.72

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Indication

Patients < age 45: Urography protocol

Patients > 45: Urothelial Tumor Follow-Up protocol

This protocol will be for patients with known urothelial cancer (bladder or ureters) and NO current evidence of or suspected metastatic disease. Eval for recurrence, high risk recurrence, evaluate urothelium or high risk TCC in history. Also, some of these patients will not have a bladder (so no need for those to void as they will have a urostomy).

For patients with known metastatic disease or screening for metastatic disease use High image quality cancer follow up protocol

Oral Contrast

Patient will arrive with a full bladder.

Have patient void before bringing patient into the scanner.

Give an additional 200mL dose of water on the CT scan table.

Pre-Scan Instructions

Clamp Foley catheter prior to scanning. Make sure to place Foley below the level of the bladder.

IV Contrast Parameters 350

Select the Ulrich Weight-Based Adult 3mL protocol which will load the following settings: Saline Test Bolus 3mL/sec Weight based volume 3mL/sec (see below) Saline Flush 50 mL 3mL/sec

Iohexol (Omnipaque) 350 mg/mL injection at a rate of 3 mL/sec

For sites without the Ulrich use Medrad p3T or refer to the weight based contrast tables included with the protocol booklet.

IV Contrast Parameters 300/370

Medrad™ P3T Abdomen protocol.

Iohexol (Omnipaque) 300 mg/mL injection at a rate of 3 mL/sec

For sites without the Medrad™ P3T or P3T PA option, refer to the weight based contrast tables we provide in the protocol booklet.

Field of View

Same as previous study or as small as appropriate

Scan Description

- Series 1 - PA & lateral scouts: from diaphragm through bladder.
- Series 2 - Helical Scan, Without Contrast
  - Scan Range: Start at the top of the kidneys and end at the bottom of the bladder base or the prostate on men.
- Series 3 - Helical Scan, Urothelial Phase
  - Start the injection and the scanner at the same time, there is a 60 sec delay built into the scanner.
  - Scan Range: Start scan at the top of the diaphragm and end at pubic symphysis.
- Series 4 – Helical Scan, Delay
  - Wait 10 minutes before scanning this phase
  - Scan Range: Start at the top of the kidneys and end at the bottom of the bladder base or the prostate on men.

Reformat Instructions

Use DMPR on THIN ST.

Reformats

Contrast (do these for all three phases if using the Urothelial tumor follow-up protocol)

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
SA BODY	THIN ST	DMPR	Average	350/50	3	2	sagittal
CO BODY	THIN ST	DMPR	Average	350/50	3	2	coronal

Networking

- All images are networked to PACS (ALI_Store).
- Note: If smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

Miscellaneous

None

Acquisition Parameters

Series 1, Scout

	Small	Medium	Large
Scout 1 kV	100	120	140
Scout 1 mA	10	10	10
Scout 1 Angle	180	180	180
Scout 2 kV	100	120	140
Scout 2 mA	40	40	80
Scout 2 Angle	90	90	90
WW/WL for Scout	500/50	500/50	500/50

Series 2, Scan Phase

	Small	Medium	Large
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**40**	**40**	**40**
Detector Rows	**64.0**	**64.0**	**64.0**
Detector Configuration	**64x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Large Body**	**Large Body**	**Large Body**
Pitch	**0.516**	**0.516**	**0.516**
Speed (mm/rot)	**20.60**	**20.60**	**20.60**
Rotation Time (s)	**0.5**	**0.5**	**0.6**
kV	**100**	**120**	**140**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(40-320)**	**(50-480)**	**(40-470)**
Manual mA	**200.0**	**240.0**	**270.0**
Noise Index	**14.0**	**16.0**	**20.5**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.5**	**2.5**	**2.5**

Series 2, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**350/50**	**350/50**	**350/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option			
ASiR/ASiR256/DLIR	**40% / 20% / Low**	**40% / 20% / Low**	**40% / 20% / Low**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.5**	**2.5**	**2.5**
Recon 2 (Secondary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**350/50**	**350/50**	**350/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**40% / 20% / Low**	**40% / 20% / Low**	**40% / 20% / Low**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Series 3, Scan Phase

	Small	Medium	Large
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**40**	**40**	**40**
Detector Rows	**64.0**	**64.0**	**64.0**
Detector Configuration	**64x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Large Body**	**Large Body**	**Large Body**
Pitch	**0.516**	**0.516**	**0.516**
Speed (mm/rot)	**20.60**	**20.60**	**20.60**
Rotation Time (s)	**0.5**	**0.7**	**0.8**
kV	**100**	**120**	**140**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(60-460)**	**(50-490)**	**(45-500)**
Manual mA	**290.0**	**250.0**	**290.0**
Noise Index	**11.5**	**13.5**	**17.0**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.5**	**2.5**	**2.5**

Series 3, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**350/50**	**350/50**	**350/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option			
ASiR/ASiR256/DLIR	**40% / 20% / Low**	**40% / 20% / Low**	**40% / 20% / Low**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.5**	**2.5**	**2.5**
Recon 2 (Secondary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**350/50**	**350/50**	**350/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**40% / 20% / Low**	**40% / 20% / Low**	**40% / 20% / Low**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Series 4, Scan Phase

	Small	Medium	Large
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**40**	**40**	**40**
Detector Rows	**64.0**	**64.0**	**64.0**
Detector Configuration	**64x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Large Body**	**Large Body**	**Large Body**
Pitch	**0.516**	**0.516**	**0.516**
Speed (mm/rot)	**20.60**	**20.60**	**20.60**
Rotation Time (s)	**0.5**	**0.7**	**0.8**
kV	**100**	**120**	**140**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(60-460)**	**(50-490)**	**(45-500)**
Manual mA	**290.0**	**250.0**	**290.0**
Noise Index	**11.5**	**13.5**	**17.0**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.5**	**2.5**	**2.5**

Series 4, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**350/50**	**350/50**	**350/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option			
ASiR/ASiR256/DLIR	**40% / 20% / Low**	**40% / 20% / Low**	**40% / 20% / Low**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.5**	**2.5**	**2.5**
Recon 2 (Secondary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**350/50**	**350/50**	**350/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**40% / 20% / Low**	**40% / 20% / Low**	**40% / 20% / Low**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Abd/Pelvis - Venogram (Pre-IVC Filter Removal) 6.73/6.74/6.75

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Indication

This is a standard CT of the abdomen and pelvis optimized for evaluation of residual clot in the IVC prior to IVC filter removal

Oral Contrast

None

Pre-Scan Instructions

None

IV Contrast Parameters 350

Use the Medrad™ P3T Abdomen protocol, or Ulrich Routine Body protocol with Iohexol (Omnipaque) 350 mg/mL injection at a rate of 2 mL per second.

For sites without the Medrad™ P3T or UW ConCal option, refer to the weight based contrast tables we provide in the protocol booklet.

IV Contrast Parameters 300/370

Use the Medrad™ P3T Abdomen protocol, Iohexol (Omnipaque) 300 mg/mL injection at a rate of 2 mL per second.

For sites without the Medrad™ P3T or P3T PA option, refer to the weight based contrast tables we provide in the protocol booklet.

Field of View

As small as possible

Scan Description

- Series 1 - AP/Lateral Scouts: from diaphragm through pubic symphysis.
- Series 2
  - Timing: Begin 120 seconds after the injection.
  - With IV Contrast: Scan from the top of the diaphragm, end at the pubic symphysis.

Reformat Instructions

Use DMPR on THIN ST.

Reformats

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
SA BODY	THIN ST	DMPR	Average	350/50	3	2	sagittal
CO BODY	THIN ST	DMPR	Average	350/50	3	2	coronal

Networking

- Chest scan send all series to PACS (ALI_Store) including the Dose Information Slide.
- All body images are networked to PACS (ALI_Store).
- Note: if smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

Miscellaneous

None

Acquisition Parameters

Series 1, Scout

	Small	Medium	Large
Scout 1 kV	**100**	**120**	**140**
Scout 1 mA	**10**	**10**	**10**
Scout 1 Angle	**180**	**180**	**180**
Scout 2 kV	**100**	**120**	**140**
Scout 2 mA	**40**	**40**	**80**
Scout 2 Angle	**90**	**90**	**90**
WW/WL for Scout	**500/50**	**500/50**	**500/50**

Series 2, Scan Phase

	Small	Medium	Large
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**40**	**40**	**40**
Detector Rows	**64.0**	**64.0**	**64.0**
Detector Configuration	**64x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Large Body**	**Large Body**	**Large Body**
Pitch	**0.516**	**0.516**	**0.516**
Speed (mm/rot)	**20.60**	**20.60**	**20.60**
Rotation Time (s)	**0.5**	**0.5**	**0.6**
kV	**100**	**120**	**140**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(40-320)**	**(50-480)**	**(40-470)**
Manual mA	**200.0**	**240.0**	**270.0**
Noise Index	**14.0**	**16.0**	**20.5**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.5**	**2.5**	**2.5**

Series 2, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**350/50**	**350/50**	**350/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option			
ASiR/ASiR256/DLIR	**40% / 20% / Low**	**40% / 20% / Low**	**40% / 20% / Low**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.5**	**2.5**	**2.5**
Recon 2 (Secondary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**350/50**	**350/50**	**350/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**40% / 20% / Low**	**40% / 20% / Low**	**40% / 20% / Low**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

CTA Abd/Pelvis - Active Bleeder 6.79/6.80/6.81

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Indication

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.

If only looking for hematoma, consider Non-Con Abd/Pelvis.

Consult with clinical team to clarify question/concern.

Oral Contrast

None

Pre-Scan Instructions

None

IV Contrast Parameters 350

Select Ulrich Weight-Based Angio Body protocols 38-44

Iohexol 350 mgI/ml (Isovue) injection

For sites without the Ulrich, use Medrad™ P3T PA option, or refer to the weight based contrast tables we provide in the protocol booklet.

IV Contrast Parameters 300/370

Medrad™ P3T PA protocol

To set up P3T= choose P3T, Thorax, PA then click on ok. Confirm contrast and load fluids. Enter scan duration and click ok.

Iopamidol 370 mgI/ml (Isovue) injection

For sites without the Medrad™ P3T or P3T PA option, refer to the weight based contrast tables we provide in the protocol booklet.

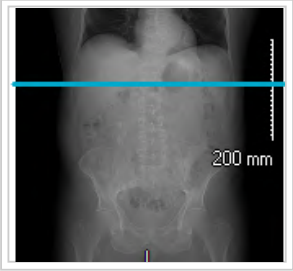
Field of View

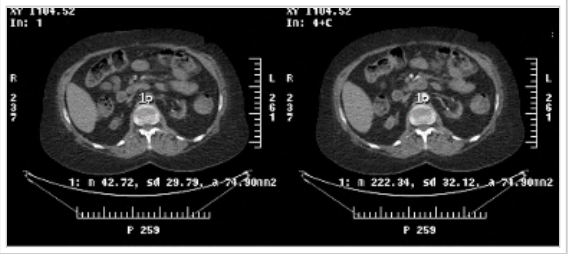
Same as previous study or as small as appropriate

Scan Description

- **Series 1** - PA and lateral scouts: from diaphragm through pubic symphysis
- **Series 2** - Helical Non Contrast: Start scan just above the diaphragm end just below the pubic symphysis.
- **Series 3** - Helical scan performed in 2 groups

- 1st Group: Arterial phase: Start scan just above the diaphragm and end scan just below the pubic symphysis.
- 2nd Group: Parenchymal phase: Scanned at 70 seconds after injection. Adjust Prep Group delay to achieve this. Start just above the diaphragm and end scan just below the pubic symphysis.
    - Smart prep - Monitor Phase: at the level of the celiac on the aorta. **Dynamic transition is turned on so the scan will progress without the need for you to hit 'scan phase'.**





Reformat Instructions

Use DMPR on THIN ST. Perform reformats for all phases (non contrast, arterial, and parenchymal phases).

In the United States, CT Angiography CPT codes require the performance and documentation of 3D angiographic rendering, which may include maximum intensity projection (MIP), volumetric rendering, and/or surface rendering techniques.

Reformats

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
SA BODY	THIN ST	DMPR	Average	350/50	3	2	sagittal
CO BODY	THIN ST	DMPR	Average	350/50	3	2	coronal

Networking

- All images are networked to PACS (ALI_Store).
- Thin 1.25 mm images are auto- networked to CTAW1/3D Lab.
- If there is a chest scanned send all images networked to PACS (ALI_Store).
- Note: if smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

Miscellaneous

None

Acquisition Parameters

Series 1, Scout

	Small	Medium	Large
Scout 1 kV	100	120	140
Scout 1 mA	10	10	10
Scout 1 Angle	180	180	180
Scout 2 kV	100	120	140
Scout 2 mA	40	40	80
Scout 2 Angle	90	90	90
WW/WL for Scout	500/50	500/50	500/50

Series 2, Scan Phase

	Small	Medium	Large
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**40**	**40**	**40**
Detector Rows	**64.0**	**64.0**	**64.0**
Detector Configuration	**64x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Large Body**	**Large Body**	**Large Body**
Pitch	**0.516**	**0.516**	**0.516**
Speed (mm/rot)	**20.60**	**20.60**	**20.60**
Rotation Time (s)	**0.5**	**0.5**	**0.6**
kV	**100**	**120**	**140**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(40-320)**	**(50-480)**	**(40-470)**
Manual mA	**200.0**	**240.0**	**270.0**
Noise Index	**14.0**	**16.0**	**20.5**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.5**	**2.5**	**2.5**

Series 2, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**350/50**	**350/50**	**350/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option			
ASiR/ASiR256/DLIR	**40% / 20% / Low**	**40% / 20% / Low**	**40% / 20% / Low**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.5**	**2.5**	**2.5**
Recon 2 (Secondary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**350/50**	**350/50**	**350/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**40% / 20% / Low**	**40% / 20% / Low**	**40% / 20% / Low**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Series 3, Smart Prep

	Small	Medium	Large
mA	**40**	**40**	**40**
Monitoring Delay (sec)	**10**	**10**	**10**
Monitoring ISD (sec)	**3**	**3**	**3**
Enhancement Threshold (HU)	**100**	**100**	**100**
Diagnostic Delay	**Auto Minimum**	**Auto Minimum**	**Auto Minimum**

Series 3, Group 1, Scan Phase

	Small	Medium	Large
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**40**	**40**	**40**
Detector Rows	**64.0**	**64.0**	**64.0**
Detector Configuration	**64x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Large Body**	**Large Body**	**Large Body**
Pitch	**0.516**	**0.516**	**0.516**
Speed (mm/rot)	**20.60**	**20.60**	**20.60**
Rotation Time (s)	**1**	**1**	**1**
kV	**80**	**100**	**120**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(50-410)**	**(50-480)**	**(50-515)**
Manual mA	**260.0**	**270.0**	**330.0**
Noise Index	**23.0**	**25.0**	**31.0**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Series 3, Group 1, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**350/50**	**350/50**	**350/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**40% / 20% / Low**	**40% / 20% / Low**	**40% / 20% / Low**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Series 3, Group 2, Scan Phase

	Small	Medium	Large
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**40**	**40**	**40**
Detector Rows	**64.0**	**64.0**	**64.0**
Detector Configuration	**64x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Large Body**	**Large Body**	**Large Body**
Pitch	**0.516**	**0.516**	**0.516**
Speed (mm/rot)	**20.60**	**20.60**	**20.60**
Rotation Time (s)	**0.5**	**0.5**	**0.6**
kV	**100**	**120**	**140**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(40-320)**	**(50-480)**	**(40-470)**
Manual mA	**200.0**	**240.0**	**270.0**
Noise Index	**14.0**	**16.0**	**20.5**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.5**	**2.5**	**2.5**

Series 3, Group 2, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**350/50**	**350/50**	**350/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option			
ASiR/ASiR256/DLIR	**40% / 20% / Low**	**40% / 20% / Low**	**40% / 20% / Low**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.5**	**2.5**	**2.5**
Recon 2 (Secondary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**350/50**	**350/50**	**350/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**40% / 20% / Low**	**40% / 20% / Low**	**40% / 20% / Low**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Abd-Liver - Hepatocellular Carcinoma (HCC) 6.82/6.83/6.84

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Indication

Arterial, Venous, and Delayed phase scanning for the evaluation of possible hepatocellular carcinoma. This protocol fulfills the UNOS criteria.

Video for this protocol

Oral Contrast

Give a total 800 mL of water over the course of one hour prior to scan. Ask patient to drink slowly and steadily.

Give an additional 200mL dose of water on the CT scan table.

Pre-Scan Instructions

This scan is a Bi-phasic exam of the liver followed by a 3 minute delay to assess for Hepatocellular Carcinoma.

IV Contrast Parameter 350s

Select the Ulrich Weight-Based Adult 5mL protocol which will load the following settings: Saline Test Bolus 5mL/sec Weight based volume 5mL/sec (see below) Saline Flush 30 mL at a rate of 5mL/sec

Iohexol (Omnipaque) 350 mg/mL injection at a rate of 5 mL/sec

For sites without the Ulrich use Medrad p3T or refer to the weight based contrast tables included with the protocol booklet.

IV Contrast Parameter 300/370s

Medrad™ P3T Abdomen protocol;

Iohexol (Omnipaque) 300 mg/mL injection at a rate of 5 mL/sec

For sites without the Medrad™ P3T or P3T PA option, refer to the weight based contrast tables we provide in the protocol booklet.

Field of View

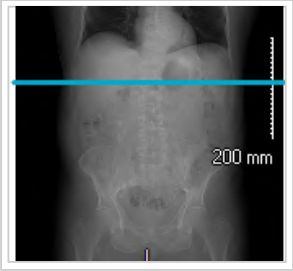
Same as previous study or as small as appropriate

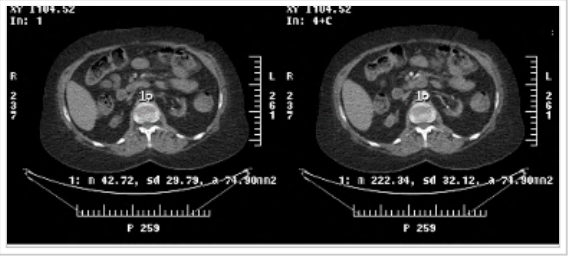
Scan Description

- **Series 1** - PA & lateral scout: from diaphragm through iliac crests or pubic symphysis.
- **Series 2** – Helical Scan- Scan Phase With IV Contrast: This scan is performed in 2 groups.
  - 1st group - Late Arterial Phase - Start scan just above the liver and end just below the bottom of the liver.

    - 2nd group - Portal Venous Phase - Scanned at 70 seconds from the start of the injection. Adjust Prep Group delay to achieve this. Start scan just above the liver (same place as group 1). For Abdomen only end at the iliac crests or for Abdomen/Pelvis end at pubic symphysis.
- If doing a Chest with a biphasic, include the chest with the 2nd group. Be sure to subtract the amount of time it takes to scan through the chest from the 70 seconds from the start of injection.
    - Smart Prep- Monitor Phase: Place ROI on the aorta at the level of mid liver. **Dynamic transition is turned on so the scan will progress without the need for you to hit 'scan phase'.** There will be a 15 second diagnostic delay built in.
- **Series 3** - Delay Phase - 3 Min Delay
    - Coverage: Start at top of diaphragm and end at bottom of the liver.

SMART PREP REFERENCE PICTURES:





Reformat Instructions

Use DMPR on THIN ST.

Reformats

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
SA BODY	THIN ST	DMPR	Average	350/50	3	2	sagittal
CO BODY	THIN ST	DMPR	Average	350/50	3	2	coronal

Networking

- Chest scan send all series to PACS (ALI_Store) including the Dose Information Slide.
- All body images are networked to PACS (ALI_Store).
- Note: if smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

Miscellaneous

None

Acquisition Parameters

Series 1, Scout

	Small	Medium	Large
Scout 1 kV	100	120	140
Scout 1 mA	10	10	10
Scout 1 Angle	180	180	180
Scout 2 kV	100	120	140
Scout 2 mA	40	40	80
Scout 2 Angle	90	90	90
WW/WL for Scout	500/50	500/50	500/50

Series 2, Smart Prep

	Small	Medium	Large
mA	**40**	**40**	**40**
Monitoring Delay (sec)	**15**	**15**	**15**
Monitoring ISD (sec)	**3**	**3**	**3**
Enhancement Threshold (HU)	**100**	**100**	**100**
Diagnostic Delay	**15**	**15**	**15**

Series 2, Group 1, Scan Phase

	Small	Medium	Large
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**40**	**40**	**40**
Detector Rows	**64.0**	**64.0**	**64.0**
Detector Configuration	**64x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Large Body**	**Large Body**	**Large Body**
Pitch	**0.516**	**0.516**	**0.516**
Speed (mm/rot)	**20.60**	**20.60**	**20.60**
Rotation Time (s)	**0.6**	**0.7**	**0.7**
kV	**80**	**100**	**120**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(50-380)**	**(45-430)**	**(40-460)**
Manual mA	**240.0**	**210.0**	**260.0**
Noise Index	**17.5**	**19.0**	**24.0**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.5**	**2.5**	**2.5**

Series 2, Group 1, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**350/50**	**350/50**	**350/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option			
ASiR/ASiR256/DLIR	**40% / 20% / Low**	**40% / 20% / Low**	**40% / 20% / Low**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.5**	**2.5**	**2.5**
Recon 2 (Secondary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**350/50**	**350/50**	**350/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**40% / 20% / Low**	**40% / 20% / Low**	**40% / 20% / Low**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Series 2, Group 2, Scan Phase

	Small	Medium	Large
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**40**	**40**	**40**
Detector Rows	**64.0**	**64.0**	**64.0**
Detector Configuration	**64x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Large Body**	**Large Body**	**Large Body**
Pitch	**0.516**	**0.516**	**0.516**
Speed (mm/rot)	**20.60**	**20.60**	**20.60**
Rotation Time (s)	**0.5**	**0.5**	**0.6**
kV	**100**	**120**	**140**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(40-320)**	**(50-480)**	**(40-470)**
Manual mA	**200.0**	**240.0**	**270.0**
Noise Index	**14.0**	**16.0**	**20.5**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.5**	**2.5**	**2.5**

Series 2, Group 2, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**350/50**	**350/50**	**350/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option			
ASiR/ASiR256/DLIR	**40% / 20% / Low**	**40% / 20% / Low**	**40% / 20% / Low**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.5**	**2.5**	**2.5**
Recon 2 (Secondary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**350/50**	**350/50**	**350/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**40% / 20% / Low**	**40% / 20% / Low**	**40% / 20% / Low**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Series 3, Scan Phase

	Small	Medium	Large
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**40**	**40**	**40**
Detector Rows	**64.0**	**64.0**	**64.0**
Detector Configuration	**64x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Large Body**	**Large Body**	**Large Body**
Pitch	**0.516**	**0.516**	**0.516**
Speed (mm/rot)	**20.60**	**20.60**	**20.60**
Rotation Time (s)	**0.6**	**0.7**	**0.7**
kV	**80**	**100**	**120**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(50-380)**	**(45-430)**	**(40-460)**
Manual mA	**240.0**	**210.0**	**260.0**
Noise Index	**17.5**	**19.0**	**24.0**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.5**	**2.5**	**2.5**

Series 3, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**350/50**	**350/50**	**350/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option			
ASiR/ASiR256/DLIR	**40% / 20% / Low**	**40% / 20% / Low**	**40% / 20% / Low**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.5**	**2.5**	**2.5**

Abdominal Wall Flap CTA 6.88/6.89/6.90

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Indication

Evaluate abdominal wall vasculature for surgical planning for free flap.

Oral Contrast

None

Pre-Scan Instructions

Have patient lower their pants and underwear to the level of the thighs. Practice breathing instructions. Ask patient to cough just prior to the scan.

IV Contrast Parameters 350

Select the Ulrich Abdominal Wall Flap CTA protocol 46 which will load the following settings: Saline Test Bolus 5mL/sec Weight based volume at a rate of 5mL/sec (see below) Saline Flush 30 mL at a rate of 5mL/sec

For sites without the Ulrich use Medrad p3T or refer to the weight based contrast tables included with the protocol booklet.

IV Contrast Parameters 300/370

5mL Medrad™ protocol:

120 mL Iopamidol 370 mgI/mL (Isovue) at a rate of 5 mL/sec

50 mL Sodium Chloride 0.9% at a rate of 5 mL/sec

Field of View

Include entire abdominal wall – do NOT clip subcutaneous fat anteriorly. You can clip the buttocks and laterally.

Scan Description

- Series 1 - PA and lateral scout
  - During inspiration breath-hold.
  - Coverage: Diaphragm through the middle of the pubic symphysis
  - Place BB 5 cm above umbilicus
- Series 2 - CTA
  - Scan from bottom-up – ie, begin at the middle of the pubic symphysis and end at the BB (5cm above umbilicus). THIS IS EXTREMELY IMPORTANT.
  - Use Smartprep on femoral artery.
  - During inspiration breath-hold

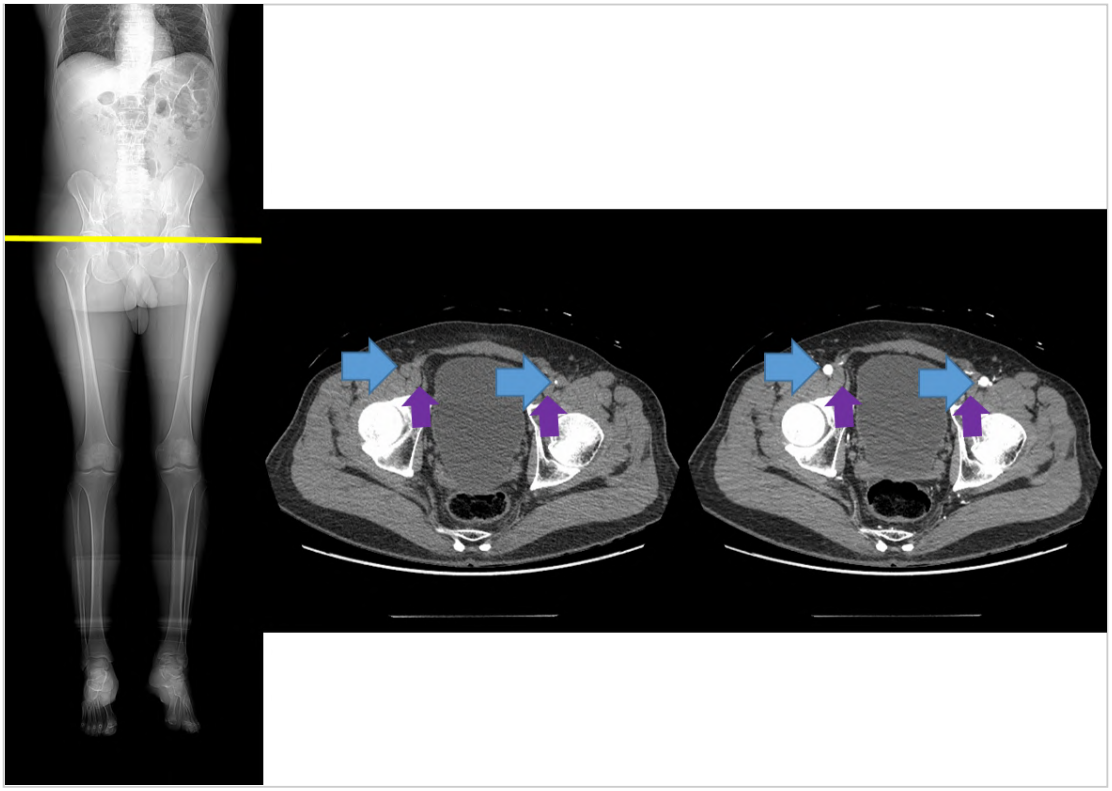


Image showing where the smart prep location is located on a scout. The image also shows the location of the femoral arteries and their appearance on a non contrast and with contrast (CTA) scan. **Blue arrows are arteries where you need to put the ROI. Purple arrows (medial/posterior to the artery) denote the veins, do not put the ROI over the veins.**

Reformat Instructions

Must be done manually off Recon 1. See Table below.

In the United States, CT Angiography CPT codes require the performance and documentation of 3D angiographic rendering, which may include maximum intensity projection (MIP), volumetric rendering, and/or surface rendering techniques.

Reformats

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
SA	Thin ST	Manual	MIP	800/150	10	5	sagittal
CO	Thin ST	Manual	MIP	800/150	10	5	coronal

Networking

- All the images are sent to PACS (ALI_Store) and 3D Lab workstation.
- Note: if smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

Miscellaneous

Give requisition to the 3D lab for processing.

Acquisition Parameters

Series 1, Scout

	Small	Medium	Large
Scout 1 kV	**100**	**120**	**140**
Scout 1 mA	**10**	**10**	**10**
Scout 1 Angle	**180**	**180**	**180**
Scout 2 kV	**100**	**120**	**140**
Scout 2 mA	**40**	**40**	**80**
Scout 2 Angle	**90**	**90**	**90**
WW/WL for Scout	**500/50**	**500/50**	**500/50**

Series 2, Smart Prep

	Small	Medium	Large
mA	**40**	**40**	**40**
Monitoring Delay (sec)	**12**	**12**	**12**
Monitoring ISD (sec)	**3**	**3**	**3**
Enhancement Threshold (HU)	**100**	**100**	**100**
Diagnostic Delay	**Auto Minimum**	**Auto Minimum**	**Auto Minimum**

Series 2, Scan Phase

	Small	Medium	Large
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**40**	**40**	**40**
Detector Rows	**64.0**	**64.0**	**64.0**
Detector Configuration	**64x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Large Body**	**Large Body**	**Large Body**
Pitch	**0.516**	**0.516**	**0.516**
Speed (mm/rot)	**20.60**	**20.60**	**20.60**
Rotation Time (s)	**0.8**	**1**	**1**
kV	**120**	**120**	**140**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(60-510)**	**(60-480)**	**(80-560)**
Manual mA	**260.0**	**320.0**	**490.0**
Noise Index	**16.0**	**24.5**	**31.0**
Slice Thickness (mm)	**0.625**	**0.625**	**0.625**
Interval (mm)	**0.312**	**0.312**	**0.312**

Note: On some 64 slice scanners, you can only get 0.625 mm collimation at 20 mm (i.e., 32 slice) modes. In these cases, please use 1.25 mm slice thickness.

Series 2, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**800/150**	**800/150**	**800/150**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**30% / 20% / Medium**	**30% / 20% / Medium**	**30% / 20% / Medium**
Slice Thickness (mm)	**0.625**	**0.625**	**0.625**
Interval (mm)	**0.312**	**0.312**	**0.312**

Cystogram 8.10/8.11/8.12

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Indication

Bladder tumor.

Video for this protocol

Oral Contrast

None

Pre-Scan Instructions

Bladder contrast – 20 ml of Iohexol 300 in a 500 ml bag of normal saline. The saline should be warmed to body temperature if time allows. Check with radiologist to see if without series needed first.

- Using sterile technique, connect the tubing from the bag of 2% contrast (see # 6) to the Foley catheter and allow the bladder to fill retrograde. Make sure to place Foley below the level of the bladder.
- If the patient is oriented, have the patient tell you when they are getting uncomfortably full. If they are unable to let you know, run about 300 ml in to start. Note on series description the amount of contrast instilled into the bladder.

IV Contrast Parameters

None

Field of View

Same as previous study or as small as appropriate

Scan Description

- Series 1 - PA and lateral scout: from crest to pubic symphysis
- Series 2 - Pre bladder contrast. Scan from the top of the crest through the pubic symphysis (skip this step if the scan was ordered with a trauma A/P)
- Series 3 – Full bladder contrast. Scan from the top of the crest through the pubic symphysis. Make sure contrast has filled the entire bladder

Note: Annotate on the series description the amount of contrast used for the cystogram

Post void (optional) - Check with radiologist, each case is different. If a post void in needed, click on repeat series. Use the same coverage and parameters as S3.

Reformat Instructions

Use DMPR on THIN ST.

Reformats

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
SA BODY	THIN ST	DMPR	Average	350/50	3	2	sagittal
CO BODY	THIN ST	DMPR	Average	350/50	3	2	coronal

Networking

- All images are networked to PACS (ALI_Store).
- Note: If smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

Miscellaneous

None

Acquisition Parameters

Series 1, Scout

	Small	Medium	Large
Scout 1 kV	100	120	140
Scout 1 mA	10	10	10
Scout 1 Angle	180	180	180
Scout 2 kV	100	120	140
Scout 2 mA	40	40	80
Scout 2 Angle	90	90	90
WW/WL for Scout	500/50	500/50	500/50

Series 2, Scan Phase

	Small	Medium	Large
Scan Type	Helical	Helical	Helical
Beam Collimation	40	40	40
Detector Rows	64.0	64.0	64.0
Detector Configuration	64x0.625	64x0.625	64x0.625
Scan FOV	Large Body	Large Body	Large Body
Pitch	0.516	0.516	0.516
Speed (mm/rot)	20.60	20.60	20.60
Rotation Time (s)	0.5	0.5	0.6
kV	100	120	140
AEC type	smart mA	smart mA	smart mA
mA Range	(40-320)	(50-480)	(40-470)
Manual mA	200.0	240.0	270.0
Noise Index	14.0	16.0	20.5
Slice Thickness (mm)	3.75	3.75	3.75
Interval (mm)	2.5	2.5	2.5

Series 2, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**350/50**	**350/50**	**350/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option			
ASiR/ASiR256/DLIR	**40% / 20% / Low**	**40% / 20% / Low**	**40% / 20% / Low**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.5**	**2.5**	**2.5**
Recon 2 (Secondary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**350/50**	**350/50**	**350/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**40% / 20% / Low**	**40% / 20% / Low**	**40% / 20% / Low**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Series 3, Scan Phase

	Small	Medium	Large
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**40**	**40**	**40**
Detector Rows	**64.0**	**64.0**	**64.0**
Detector Configuration	**64x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Large Body**	**Large Body**	**Large Body**
Pitch	**0.516**	**0.516**	**0.516**
Speed (mm/rot)	**20.60**	**20.60**	**20.60**
Rotation Time (s)	**0.5**	**0.5**	**0.6**
kV	**100**	**120**	**140**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(40-320)**	**(50-480)**	**(40-470)**
Manual mA	**200.0**	**240.0**	**270.0**
Noise Index	**14.0**	**16.0**	**20.5**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.5**	**2.5**	**2.5**

Series 3, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**350/50**	**350/50**	**350/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option			
ASiR/ASiR256/DLIR	**40% / 20% / Low**	**40% / 20% / Low**	**40% / 20% / Low**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.5**	**2.5**	**2.5**
Recon 2 (Secondary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**350/50**	**350/50**	**350/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**40% / 20% / Low**	**40% / 20% / Low**	**40% / 20% / Low**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Body Pelvis 8.16/8.17/8.18

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Indication

Evaluate for abdominal pathology other than hypervascular tumors.

Video for this protocol

Oral Contrast

Oral Contrast:

- Patient receives a total volume of 1000mL (1L) of oral contrast. Give a total of 4 doses (800 mL) plus a 2x concentrated (200 mL) dose on the CT scanner.
- 1 Dose = Mix 4mL of Iohexol 300 mg/mL (Omnipaque) in 200mL of clear liquid, no ice, no carbonation.
- Give a total of 4 doses = 800mL (Outpatients: 1 dose every 15 minutes over one hour, Inpatients: 1 dose every 30 mins over two hours).
- Give an additional 2x concentrated dose on the CT scan table. Mix 8mL of Iohexol 300mg/ mL (Omnipaque) in 200mL of clear liquid.

Bariatric Post- Op (Gastric By-Pass) patients:

- These patients are only able to tolerate 150 mL. No need for extended drink duration. Oral contrast ONLY given on the CT scan table just prior to scanning.
- Mix 4mL Iohexol 300 mg/mL (Omnipaque) in 200mL of clear liquid.
- Give 3/4 of 1 dose (150mL of 200mL) on the CT table.

Pre-Scan Instructions

Clamp Foley catheter prior to scanning. Make sure to place Foley below the level of the bladder.

IV Contrast Parameters 350

Select the Ulrich Weight-Based Adult 3mL protocol which will load the following settings: Saline Test Bolus 3mL/sec Weight based volume 3mL/sec (see below) Saline Flush 50 mL 3mL/sec

Iohexol (Omnipaque) 350 mg/mL injection at a rate of 3 mL/sec

For sites without the Ulrich use Medrad p3T or refer to the weight based contrast tables included with the protocol booklet.

IV Contrast Parameters 300/370

Medrad™ P3T Abdomen protocol.

Iohexol (Omnipaque) 300 mg/mL injection at a rate of 3 mL/sec

For sites without the Medrad™ P3T or P3T PA option, refer to the weight based contrast tables we provide in the protocol booklet.

Field of View

Same as previous study or as small as appropriate

Scan Description

- Series 1 - PA & lateral scout: from diaphragm through pubic symphysis
- Series 2 – 70 sec delay start scan at the top of the iliac crests and end at pubic symphysis

Reformat Instructions

Use DMPR on THIN ST.

Reformats

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
SA BODY	THIN ST	DMPR	Average	350/50	3	2	sagittal
CO BODY	THIN ST	DMPR	Average	350/50	3	2	coronal

Networking

- All images are networked to PACS (ALI_Store).
- Note: If smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

Miscellaneous

None

Acquisition Parameters

Series 1, Scout

	Small	Medium	Large
Scout 1 kV	100	120	140
Scout 1 mA	10	10	10
Scout 1 Angle	180	180	180
Scout 2 kV	100	120	140
Scout 2 mA	40	40	80
Scout 2 Angle	90	90	90
WW/WL for Scout	500/50	500/50	500/50

Series 2, Scan Phase

	Small	Medium	Large
Scan Type	Helical	Helical	Helical
Beam Collimation	40	40	40
Detector Rows	64.0	64.0	64.0
Detector Configuration	64x0.625	64x0.625	64x0.625
Scan FOV	Large Body	Large Body	Large Body
Pitch	0.516	0.516	0.516
Speed (mm/rot)	20.60	20.60	20.60
Rotation Time (s)	0.5	0.5	0.6
kV	100	120	140
AEC type	smart mA	smart mA	smart mA
mA Range	(40-320)	(50-480)	(40-470)
Manual mA	200.0	240.0	270.0
Noise Index	14.0	16.0	20.5
Slice Thickness (mm)	3.75	3.75	3.75
Interval (mm)	2.5	2.5	2.5

Series 2, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**350/50**	**350/50**	**350/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option			
ASiR/ASiR256/DLIR	**40% / 20% / Low**	**40% / 20% / Low**	**40% / 20% / Low**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.5**	**2.5**	**2.5**
Recon 2 (Secondary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**350/50**	**350/50**	**350/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**40% / 20% / Low**	**40% / 20% / Low**	**40% / 20% / Low**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Abd/Pelvis - R/O Hernia (Use routine Abd/Pelvis protocol)

For the limited inguinal hernia protocol there is no oral and no IV contrast

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Indication

Standard CT of the abdomen and pelvis with the patient performing a Valsalva maneuver during the scan aquisition. This increases the likelihood of detecting hernia.

Video for this protocol

Oral Contrast

Oral Contrast:

- Patient receives a total volume of 1000mL (1L) of oral contrast. Give a total of 4 doses (800 mL) plus a 2x concentrated (200 mL) dose on the CT scanner.
- 1 Dose = Mix 4mL of Iohexol 300 mg/mL (Omnipaque) in 200mL of clear liquid, no ice, no carbonation.
- Give a total of 4 doses = 800mL (Outpatients: 1 dose every 15 minutes over one hour, Inpatients: 1 dose every 30 mins over two hours).
- Give an additional 2x concentrated dose on the CT scan table. Mix 8mL of Iohexol 300mg/ mL (Omnipaque) in 200mL of clear liquid.

Bariatric Post- Op (Gastric By-Pass) patients:

- These patients are only able to tolerate 150 mL. No need for extended drink duration. Oral contrast ONLY given on the CT scan table just prior to scanning.
- Mix 4mL Iohexol 300 mg/mL (Omnipaque) in 200mL of clear liquid.
- Give 3/4 of 1 dose (150mL of 200mL) on the CT table.

Pre-Scan Instructions

Technologists should educate the patient on how to perform the Valsalva maneuver. When asked to breathe in, the patient should be instructed to bear down forcefully. They will need to hold this for the 10-20 seconds of the scan. Use the Routine Abdomen/Pelvis protocol in the scanner.

IV Contrast Parameters 350

Select the Ulrich Weight-Based Adult 3mL protocol which will load the following settings: Saline Test Bolus 3mL/sec Weight based volume 3mL/sec (see below) Saline Flush 50 mL 3mL/sec

Iohexol (Omnipaque) 350 mg/mL injection at a rate of 3 mL/sec

For sites without the Ulrich use Medrad p3T or refer to the weight based contrast tables included with the protocol booklet.

IV Contrast Parameters 300/370

Medrad™ P3T Abdomen protocol.

Iohexol (Omnipaque) 300 mg/mL injection at a rate of 3 mL/sec

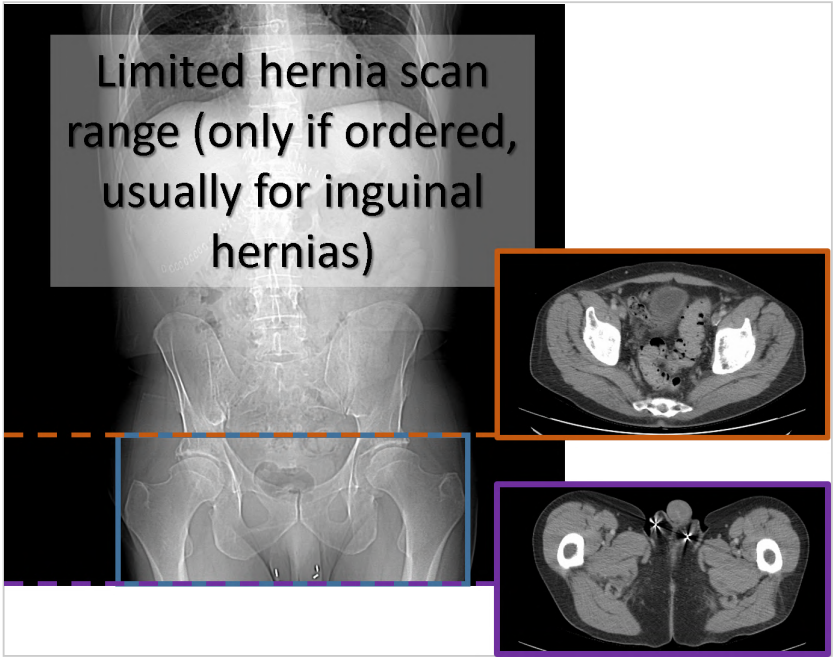
For sites without the Medrad™ P3T or P3T PA option, refer to the weight based contrast tables we provide in the protocol booklet.

Field of View

Same as previous study or as small as appropriate

Scan Description

- Series 1 - PA & lateral scout: from diaphragm through iliac crest (for abdomen only) or pubic symphysis (for abdomen/pelvis)
- Series 2
  - Smart Prep- Monitor Phase: Center over the liver. Put 3 ROIs in the liver. The smartprep threshold is 50 Hounsfield units. Wait no longer than 80 seconds before starting the scan if the threshold is not reached.
  - Helical Scan- Scan Phase: Start scan at the top of the diaphragm, for Abdomen Only end at the iliac crests or for Abdomen/Pelvis end at pubic symphysis.
    - As the scanner instructs the patient to “breathe in and hold it”, please tell the patient to “bear down”. Intermittently reinforce it by telling the patient to keep holding it. When the scanner says “breathe” please add “and relax”.



Scan range for limited hernia orders (usually for inguinal hernia).

Reformat Instructions

Use DMPR on THIN ST.

Reformats

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
SA BODY	THIN ST	DMPR	Average	350/50	3	2	sagittal
CO BODY	THIN ST	DMPR	Average	350/50	3	2	coronal

Networking

- All images are networked to PACS (ALI_Store).
- Note: If smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

Miscellaneous

None

Acquisition Parameters

Same as Abd/Pelvis 6.1/6.2/6.3

Neck/Chest/Abd/Pelvis

Please remember to change the prep group delay in the neck to 45 seconds.

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Indication

Evaluate for adenopathy, abscess, and neoplasm.

Oral Contrast

Oral Contrast:

- Patient receives a total volume of 1000mL (1L) of oral contrast. Give a total of 4 doses (800 mL) plus a 2x concentrated (200 mL) dose on the CT scanner.
- 1 Dose = Mix 4mL of Iohexol 300 mg/mL (Omnipaque) in 200mL of clear liquid, no ice, no carbonation.
- Give a total of 4 doses = 800mL (Outpatients: 1 dose every 15 minutes over one hour, Inpatients: 1 dose every 30 mins over two hours).
- Give an additional 2x concentrated dose on the CT scan table. Mix 8mL of Iohexol 300mg/ mL (Omnipaque) in 200mL of clear liquid.

Bariatric Post- Op (Gastric By-Pass) patients:

- These patients are only able to tolerate 150 mL. No need for extended drink duration. Oral contrast ONLY given on the CT scan table just prior to scanning.
- Mix 4mL Iohexol 300 mg/mL (Omnipaque) in 200mL of clear liquid.
- Give 3/4 of 1 dose (150mL of 200mL) on the CT table.

Pre-Scan Instructions

Practice breathing instructions. Ask patient to cough just prior to the scan.

IV Contrast Parameters 350

Select Ulrich protocol 48 or 49

Scan Combination	Contrast Dosage	Injection Rate
C/A/P + Neck Combo		
C/A/P	86 mL Iohexol 350 mgI/mL + 20 mL NaCl flush	3 mL/sec
Neck	64 mL Iohexol 350 mgI/mL + 20 mL NaCl flush	2 mL/sec
Change the Prep Delay to 45 seconds (from 115 seconds) on the Neck protocol.		
Chest + Neck Combo		
Chest	64 mL Iohexol 350 mgI/mL + 30 mL NaCl flush	3 mL/sec
Neck	64 mL Iohexol 350 mgI/mL + 30 mL NaCl flush	2 mL/sec
Change the Prep Delay to 45 seconds (from 115 seconds) on the Neck protocol.		

IV Contrast Parameters 300/370

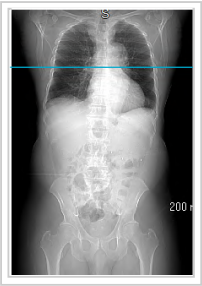
Scan Combination	Contrast Dosage	Injection Rate
C/A/P + Neck Combo		
C/A/P	100 mL Iohexol 300 mgI/mL + 20 mL NaCl flush	3 mL/sec
Neck	75 mL Iohexol 300 mgI/mL + 20 mL NaCl flush	2 mL/sec
Change the Prep Delay to 45 seconds (from 115 seconds) on the Neck protocol.		
Chest + Neck Combo		
Chest	75 mL Iohexol 300 mgI/mL + 30 mL NaCl flush	3 mL/sec
Neck	75 mL Iohexol 300 mgI/mL + 30 mL NaCl flush	2 mL/sec
Change the Prep Delay to 45 seconds (from 115 seconds) on the Neck protocol.		

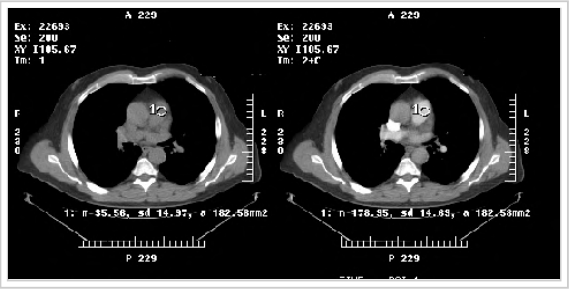
Field of View

Same as previous study or as small as appropriate

Scan Description

- Series 1 - PA and lateral scouts: manually adjust scout range to cover lower neck through iliac crest (for abdomen) or pubic symphysis (for abdomen/pelvis)
- Series 2 - Performed in 2 groups.
  - 1st group – Chest - Inspiration: Start just above the lung apices and extend through the lung bases.
  - 2nd group – Abd/Pel: Scanned at 70 seconds from the start of the injection. Adjust Prep Group delay to achieve this. For Abdomen only, end at the iliac crests; for Abdomen/Pelvis, end at pubic symphysis.
  - Smart Prep - Center over pulmonary artery, threshold 100 HU. No greater than a 50 second delay.





- **It is important to scan the CT Neck as quickly as possible to take advantage of residual contrast from CAP bolus.**
  - You will have to End Exam, re-position, re-zero, and re-scout the patient. Select small, medium and large based on the table below.
  - The CT Neck Scan requires a separate contrast injection
  - Start the scan at the top of the orbits and scan to the carina. Remind the patient not to swallow during the scan.
  - **Please remember to change the prep group delay in the neck protocol to 45 seconds**

Measure width through mid-humeral heads	Small	Medium	Large
	Shoulder width less than 46 cm *OR* BMI less than 26	**Shoulder Width 46 to 50 cm**	**Shoulder width greater than 50 cm *OR* BMI greater than 35**

Reformat Instructions

Use DMPR on THIN ST.

Reformats

C/CAP

Name	Source Series Name	DMPR or Manual		Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
SA	THIN LUNG	non-Rev256: DMPR (Chest)	Rev256: Manual (Chest)	Average	1500/-700	2.5	1.25	sagittal
CO	THIN LUNG	non-Rev256: DMPR (Chest)	Rev256: Manual (Chest)	Average	1500/-700	2.5	1.25	coronal
Axial MIP	THIN ST	Manual		MIP	1500/-700	10	5	AX MIPS
SA BODY	THIN ST	DMPR (Abd/Pelvis)		Average	350/50	3	2	sagittal
CO BODY	THIN ST	DMPR (Abd/Pelvis)		Average	350/50	3	2	coronal

Neck

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
CO ST	Thin ST	Manual	Average	300/35	3	1.5	Coronal
CO BONE	Thin Bone	Manual	Average	2500/350	1.5	0.75	Coronal
SA ST	Thin ST	Manual	Average	300/35	3	1.5	Sagittal
SA BONE	Thin Bone	Manual	Average	2500/350	1.5	0.75	Sagittal

Networking

- Chest scan - send the entire study to PACS (ALI_Store), including the Dose Information Slide.
- Abd/Pel scan - all images are networked to PACS (ALI_Store).
- Note: if smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

Miscellaneous

None

Acquisition Parameters

Use routine CAP protocol followed by routine Neck Protocol.

Brain - Routine (Helical Mode) 1.1

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

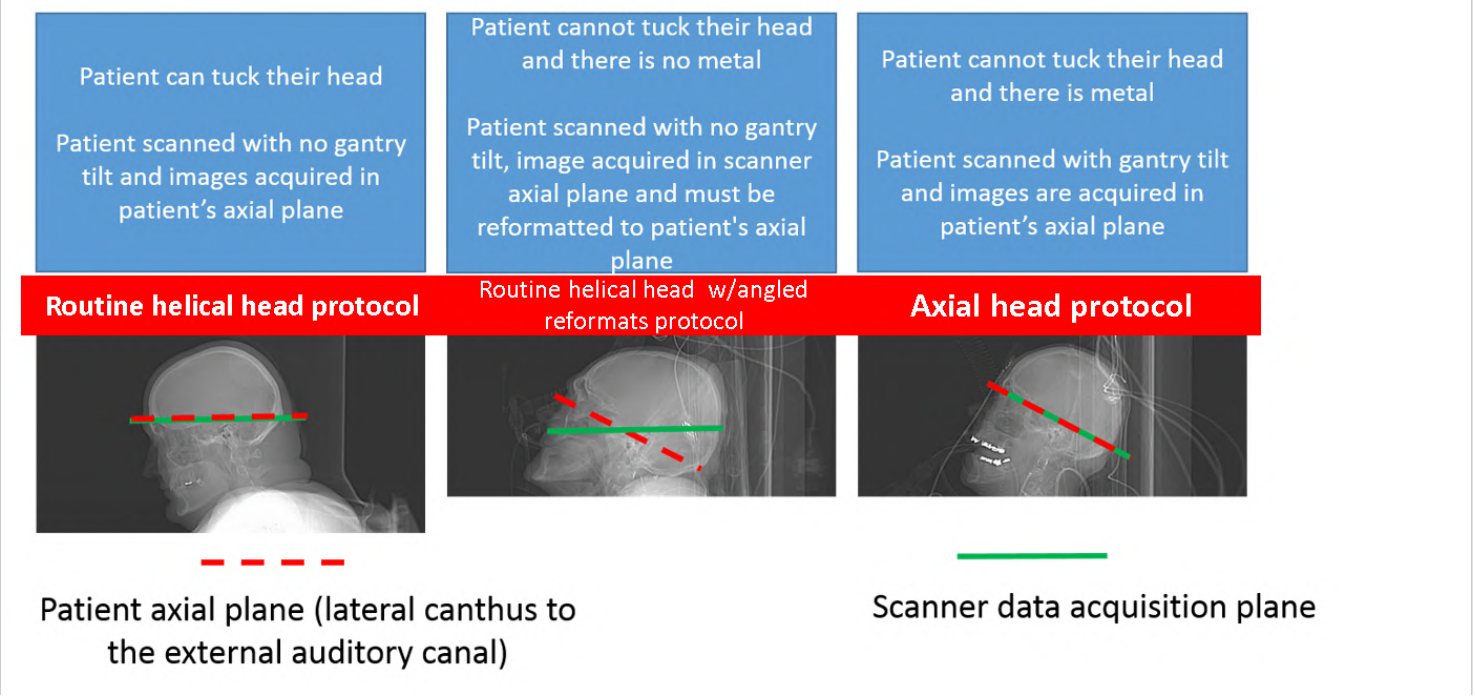
Indication

Mental status change, trauma, stroke, fall, intracranial hemorrhage.

Videos for this protocol

Routine head imaging

Head with contrast



Guidance on choosing the correct version of the routine head protocol

Oral Contrast

None

Pre-Scan Instructions

- Helical mode should be used routinely for head CT scans. Only use axial mode when you cannot move the patient's head into proper position (trauma, cervical collar, rigid neck), AND dental work would cause streak artifact in base of brain.
- Positioning: Tilt the patients head so that a line connecting the lateral canthus of the eye and the EAC is perpendicular to the CT tabletop (see below). Use axial mode and angle the gantry if you cannot place the patient's head within 15 degrees of the proper setup angle.
- Remove all metallic and high-density objects from the scanning area.

IV Contrast Parameters 350

Select Ulrich Protocols 1-3

Weight Ranges	Contrast Dosage	Injection Rate
<200 lbs. (<90 kg)	103 mL Iohexol 350 mgI/mL	2 mL/sec
200-300 lbs (90-136 kg)	120 mL Iohexol 350 mgI/mL	2 mL/sec
>300 lbs (>136 kg)	129 mL Iohexol 350 mgI/mL	2 mL/sec
Begin scanning 5 minutes after end of injection (~6 minutes from start of injection)		

IV Contrast Parameters 300/370

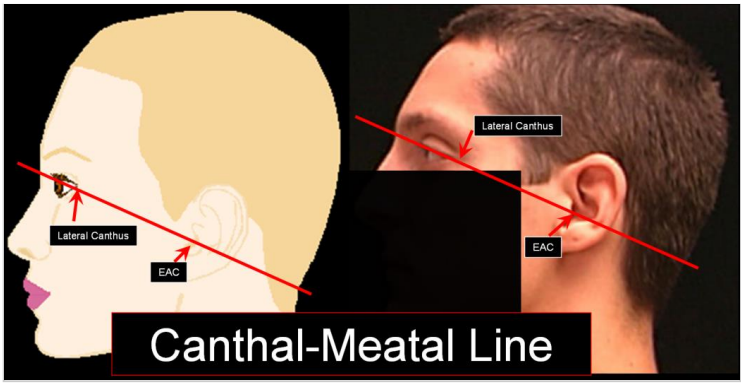
Weight Ranges	Contrast Dosage	Injection Rate
<200 lbs. (<90 kg)	120 mL Iohexol 300 mgI/mL	2 mL/sec
200-300 lbs (90-136 kg)	140 mL Iohexol 300 mgI/mL	2 mL/sec
>300 lbs (>136 kg)	150 mL Iohexol 300 mgI/mL	2 mL/sec
Begin scanning 5 minutes after end of injection (~6 minutes from start of injection)		

Field of View

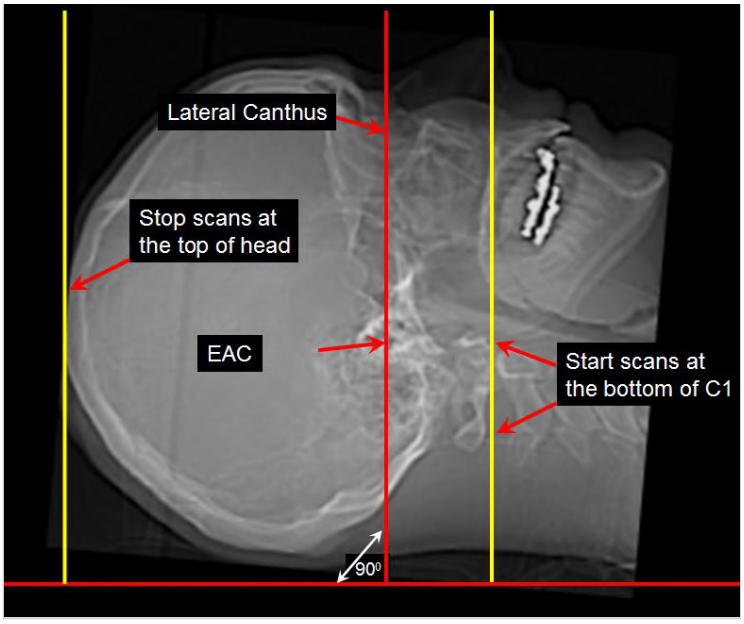
Preferred 22 cm

Scan Description

- Series 1-Scouts PA and Lateral
- Series 2-Scan Phase
  - Scan Range, start scans at the bottom of C1 and scan through the top of the head
  - If CT Head with IV Contrast only is ordered, skip the Head w/o series and use the next series.



Canthal-Meatal Line



Scan range for brain

Reformat Instructions

For Routine CT Head imaging (Adult and Peds): see the general table below.

For NAT and Pediatric Trauma: See the additional Reformat Table AND Perform a 3D.

Reformats

Name (Adult)	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL (Adult)	Slice Thickness (mm) (Adult)	Interval (mm) (Adult)	Orientation
CO ST	THIN ST	Manual	Average	180/25	3	1.5	Coronal
SA ST	THIN ST	Manual	Average	180/25	3	1.5	Sagittal

Networking

- All Images to PACS (ALI_Store).
- Note: if smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

Miscellaneous

Choose the CT scan factors on the scanner for the proper age range of the patient:

- Adult: (>= 18 years)

- Adolescent: (7 - 17 years)
- Child: (3 – 6 years)
- Infant: (0 – 2 years)

Acquisition Parameters

Series 1, Scout

	Adult
Scout 1 kV	**120**
Scout 1 mA	**10**
Scout 1 Angle	**180**
Scout 2 kV	**120**
Scout 2 mA	**20**
Scout 2 Angle	**90**
WW/WL for Scout	**500/50**

Series 2, Scan Phase

	Adult
Scan Type	**Helical**
Beam Collimation	**20**
Detector Rows	**32.0**
Detector Configuration	**32x0.625**
Scan FOV	**Head**
Pitch	**0.531**
Speed (mm/rot)	**10.60**
Rotation Time (s)	**0.5**
kV	**120**
AEC type	**smart mA**
mA Range	**(130-440)**
Manual mA	**210.0**
Noise Index	**3.4**
Slice Thickness (mm)	**5**
Interval (mm)	**3.0**

Series 2, Recons

	Adult
Recon 1 (Primary)	
DFOV	**22**
Recon Type	**Soft**
WW/WL	**80/25**
Recon Option	**Plus**
Recon Option	
ASiR/ASiR256/DLIR	**60% / 30% / Medium**
Slice Thickness (mm)	**5.0**
Interval (mm)	**3.0**
Recon 2 (Secondary)	
DFOV	**22**
Recon Type	**Bone Plus**
WW/WL	**2500/350**
Recon Option	**Plus**
Recon Option	
ASiR/ASiR256/DLIR	**None**
Slice Thickness (mm)	**2.5**
Interval (mm)	**1.5**
Recon 3 (Secondary)	
DFOV	**22**
Recon Type	**Soft**
WW/WL	**180/25**
Recon Option	**Plus**
Recon Option	**IQ Enhance**
ASiR/ASiR256/DLIR	**80% / 40% / High**
Slice Thickness (mm)	**1.25**
Interval (mm)	**0.625**

Series 3, Scan Phase

	Adult
Scan Type	**Helical**
Beam Collimation	**20**
Detector Rows	**32.0**
Detector Configuration	**32x0.625**
Scan FOV	**Head**
Pitch	**0.531**
Speed (mm/rot)	**10.60**
Rotation Time (s)	**0.6**
kV	**100**
AEC type	**smart mA**
mA Range	**(130-450)**
Manual mA	**230.0**
Noise Index	**4.0**
Slice Thickness (mm)	**5**
Interval (mm)	**3.0**

Series 3, Recons

	Adult
Recon 1 (Primary)	
DFOV	**22**
Recon Type	**Soft**
WW/WL	**80/25**
Recon Option	**Plus**
Recon Option	
ASiR/ASiR256/DLIR	**60% / 30% / Medium**
Slice Thickness (mm)	**5.0**
Interval (mm)	**3.0**
Recon 2 (Secondary)	
DFOV	**22**
Recon Type	**Bone Plus**
WW/WL	**2500/350**
Recon Option	**Plus**
Recon Option	
ASiR/ASiR256/DLIR	**None**
Slice Thickness (mm)	**2.5**
Interval (mm)	**1.5**
Recon 3 (Secondary)	
DFOV	**22**
Recon Type	**Soft**
WW/WL	**180/25**
Recon Option	**Plus**
Recon Option	**IQ Enhance**
ASiR/ASiR256/DLIR	**80% / 40% / High**
Slice Thickness (mm)	**1.25**
Interval (mm)	**0.625**

Brain - Helical Scan with Angled Axial Reformations 1.2

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

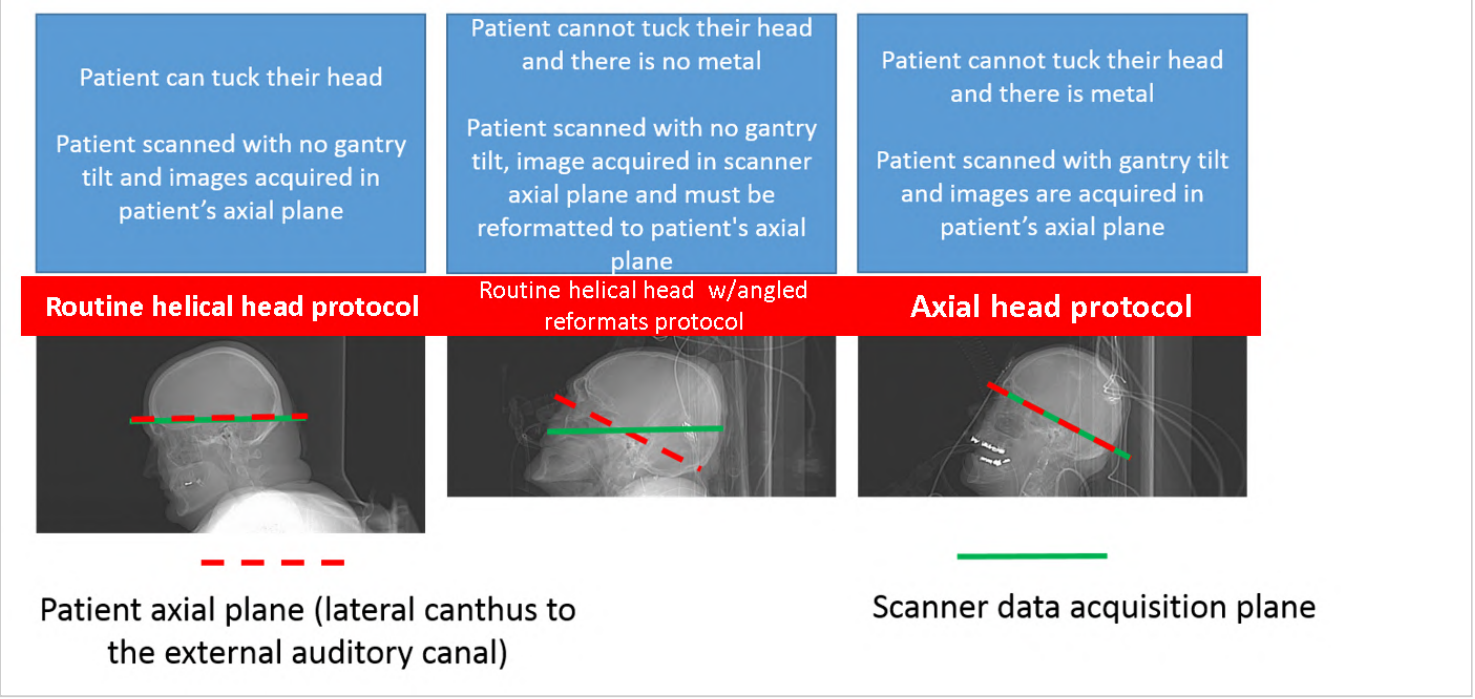
Indication

Mental status change, trauma, stroke, fall, intracranial hemorrhage.

Videos for this protocol

Routine head imaging

Head with contrast



Guidance on choosing the correct version of the routine head protocol

Oral Contrast

None

Pre-Scan Instructions

- 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).
- Important: Be certain that dental filling artifact does not extend across the brain on the helical raw data. If it does, then use the axial mode head protocol instead.
- Remove all metallic and high-density objects from the scanning area.

IV Contrast Parameters 350

Select Ulrich Protocols 1-3

Weight Ranges	Contrast Dosage	Injection Rate
<200 lbs. (<90 kg)	103 mL Iohexol 350 mgI/mL	2 mL/sec
200-300 lbs (90-136 kg)	120 mL Iohexol 350 mgI/mL	2 mL/sec
>300 lbs (>136 kg)	129 mL Iohexol 350 mgI/mL	2 mL/sec
Begin scanning 5 minutes after end of injection (~6 minutes from start of injection)		

IV Contrast Parameters 300/370

Weight Ranges	Contrast Dosage	Injection Rate
<200 lbs. (<90 kg)	120 mL Iohexol 300 mgI/mL	2 mL/sec
200-300 lbs (90-136 kg)	140 mL Iohexol 300 mgI/mL	2 mL/sec
>300 lbs (>136 kg)	150 mL Iohexol 300 mgI/mL	2 mL/sec
Begin scanning 5 minutes after end of injection (~6 minutes from start of injection)		

Field of View

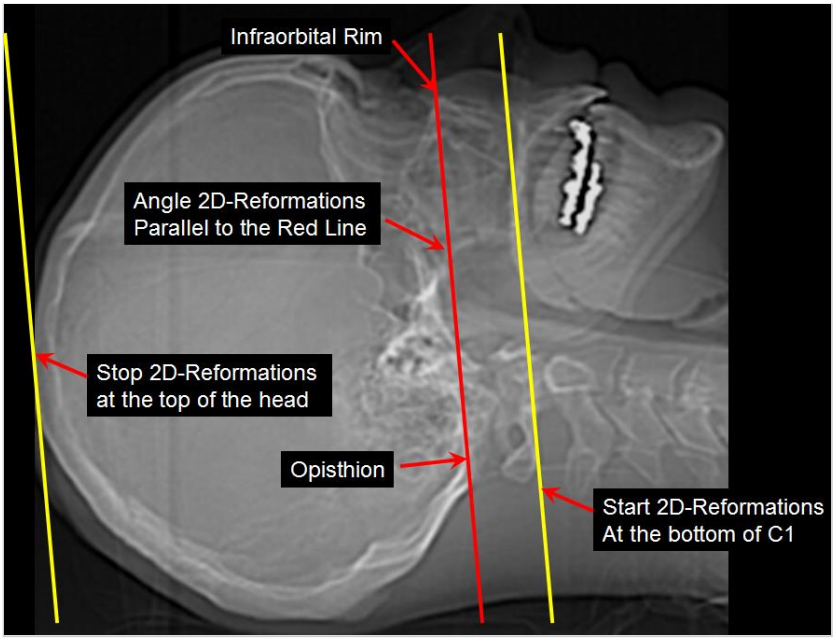
Preferred 22 cm

Scan Description

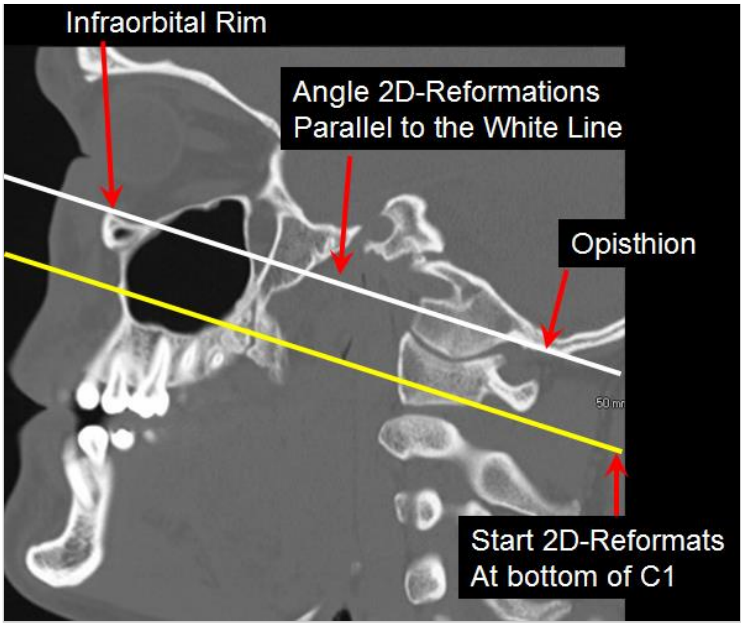
- Series 1 - Scouts PA and Lateral
- Series 2 – Start the scans at C1 and scan through the top of the head

Reformat Instructions

Obtain Axial 2D - reformats parallel to a line connecting the infraorbital rim with the opisthion (base of skull) (See below). Use Multi-oblique tool in reformat to correct for misaligned patient. Then scroll in Sagittal port to locate infraorbital rim and choose proper angle of reconstruction. Align Batch with infraorbital rim and opisthion (base of skull), starting bottom-up. Reset pointer, making sure to re-adjust your multi-oblique lines if necessary.



Helical Scan with Angled Axial Reformations



Helical

Reformats

Name (Adult)	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL (Adult)	Slice Thickness (mm) (Adult)	Interval (mm) (Adult)	Orientation
AX ST	THIN ST	Manual	Average	80/25	5	2.5	Axial
AX BONE	THIN BONE	Manual	Average	2500/350	2.5	1.25	Axial
CO ST	THIN ST	Manual	Average	180/25	3	1.5	Coronal
SA ST	THIN ST	Manual	Average	180/25	3	1.5	Sagittal

Networking

- All Images to PACS (ALI_Store).
- Note: if smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

Miscellaneous

Choose the CT scan factors on the scanner for the proper age range of the patient:

- Adult: (>= 18 years)
- Adolescent: (7 - 17 years)
- Child: (3 – 6 years)
- Infant: (0 – 2 years)

Acquisition Parameters

Series 1, Scout

	Adult
Scout 1 kV	**120**
Scout 1 mA	**10**
Scout 1 Angle	**180**
Scout 2 kV	**120**
Scout 2 mA	**20**
Scout 2 Angle	**90**
WW/WL for Scout	**500/50**

Series 2, Scan Phase

	Adult
Scan Type	**Helical**
Beam Collimation	**20**
Detector Rows	**32.0**
Detector Configuration	**32x0.625**
Scan FOV	**Head**
Pitch	**0.531**
Speed (mm/rot)	**10.60**
Rotation Time (s)	**0.5**
kV	**120**
AEC type	**smart mA**
mA Range	**(130-440)**
Manual mA	**210.0**
Noise Index	**6.8**
Slice Thickness (mm)	**1.25**
Interval (mm)	**0.625**

Series 2, Recons

	Adult
Recon 1 (Primary)	
DFOV	**22**
Recon Type	**Soft**
WW/WL	**180/25**
Recon Option	**Plus**
Recon Option	**IQ Enhance**
ASiR/ASiR256/DLIR	**60% / 30% / High**
Slice Thickness (mm)	**1.25**
Interval (mm)	**0.625**
Recon 2 (Secondary)	
DFOV	**22**
Recon Type	**Bone Plus**
WW/WL	**2500/350**
Recon Option	**Plus**
Recon Option	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**
Slice Thickness (mm)	**0.625**
Interval (mm)	**0.312**

Series 3, Scan Phase

	Adult
Scan Type	**Helical**
Beam Collimation	**20**
Detector Rows	**32.0**
Detector Configuration	**32x0.625**
Scan FOV	**Head**
Pitch	**0.531**
Speed (mm/rot)	**10.60**
Rotation Time (s)	**0.6**
kV	**100**
AEC type	**smart mA**
mA Range	**(130-450)**
Manual mA	**230.0**
Noise Index	**8.0**
Slice Thickness (mm)	**1.25**
Interval (mm)	**0.625**

Series 3, Recons

	Adult
Recon 1 (Primary)	
DFOV	**22**
Recon Type	**Soft**
WW/WL	**180/25**
Recon Option	**Plus**
Recon Option	**IQ Enhance**
ASiR/ASiR256/DLIR	**60% / 30% / High**
Slice Thickness (mm)	**1.25**
Interval (mm)	**0.625**
Recon 2 (Secondary)	
DFOV	**22**
Recon Type	**Bone Plus**
WW/WL	**2500/350**
Recon Option	**Plus**
Recon Option	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**
Slice Thickness (mm)	**0.625**
Interval (mm)	**0.312**

16 & 32 Slice Scanner Exceptions:

1. The 0.625mm slice thickness x 0.312mm interval Recon should be 1.25mm slice thickness x 0.625mm interval on 16 and 32 slice CT scanners. The 16 and 32 slice scanners are only able to recon down to 0.625mm slice thickness when using 10mm and/or 20mm beam collimation respectively. However, when using 20mm and/or 40mm beam collimation, they are only capable of reconstructing to 1.25mm slice thickness.
2. MARS feature is not an option.
3. IQ Enhance feature requires thin slices (1.25mm or less) with an interval of half (or less). On older scanner models, in order to enable IQ Enhance at 0.625 mm slice thickness, the interval must be set to 0.311 mm instead of 0.312 mm.

Brain (Axial Mode) 1.3

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

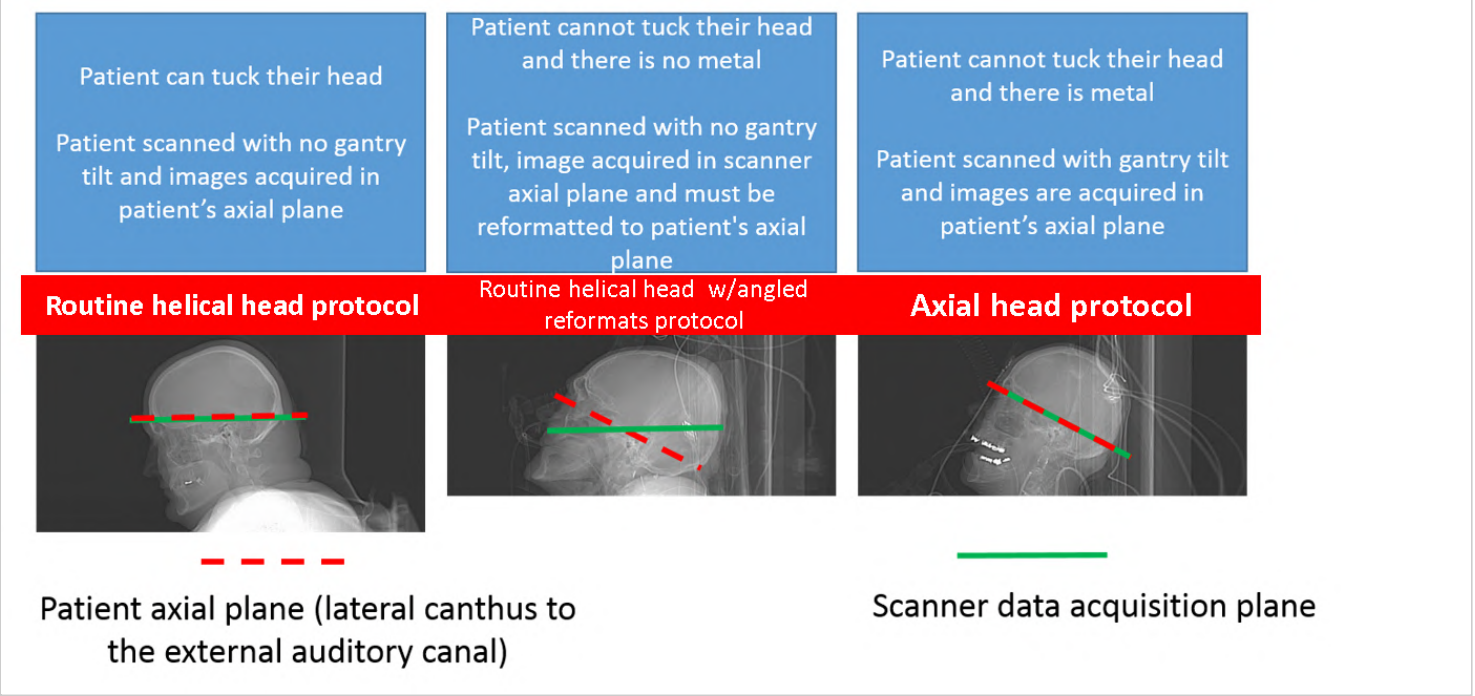
Indication

Mental status change, trauma, stroke, fall, intracranial hemorrhage.

Videos for this protocol

Routine head imaging

Head with contrast



Guidance on choosing the correct version of the routine head protocol

Oral Contrast

None

Pre-Scan Instructions

- Helical mode should be used routinely for head CT scans. Only use axial mode when you cannot move the patient's head into proper position (trauma, cervical collar, rigid neck). This mode can also be used in unstable patients in the ED when the CT scan time must be expedited.
- Patient Positioning: Using the lateral scout image, angle the gantry so that it is parallel to a line connecting the infraorbital rim with the opisthion (see below).
- Remove all metallic and high-density objects from the scanning area.

IV Contrast Parameters 350

Select Ulrich Protocols 1-3

Weight Ranges	Contrast Dosage	Injection Rate
<200 lbs. (<90 kg)	103 mL Iohexol 350 mgI/mL	2 mL/sec
200-300 lbs (90-136 kg)	120 mL Iohexol 350 mgI/mL	2 mL/sec
>300 lbs (>136 kg)	129 mL Iohexol 350 mgI/mL	2 mL/sec
Begin scanning 5 minutes after end of injection (~6 minutes from start of injection)		

IV Contrast Parameters 300/370

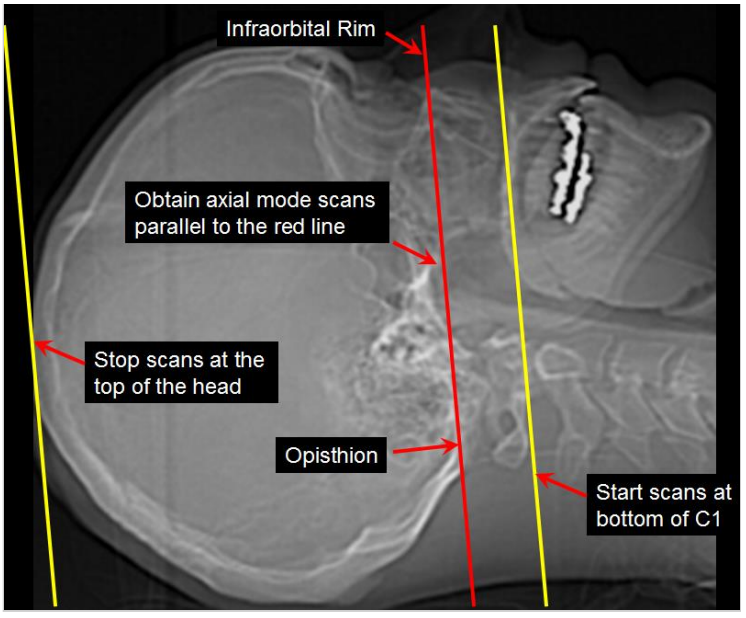
Weight Ranges	Contrast Dosage	Injection Rate
<200 lbs. (<90 kg)	120 mL Iohexol 300 mgI/mL	2 mL/sec
200-300 lbs (90-136 kg)	140 mL Iohexol 300 mgI/mL	2 mL/sec
>300 lbs (>136 kg)	150 mL Iohexol 300 mgI/mL	2 mL/sec
Begin scanning 5 minutes after end of injection (~6 minutes from start of injection)		

Field of View

Preferred 22 cm

Scan Description

- Series 1 - Scouts PA and Lateral
- Series 2 – Start scans at the bottom of C1 and scan through the top of the head



sagittal brain

Reformat Instructions

No special reformat instructions, see the reformat section for basic details.

Reformats

Name (Adult)	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL (Adult)	Slice Thickness (mm) (Adult)	Interval (mm) (Adult)	Orientation
CO ST	THIN ST	Manual	Average	180/25	3	1.5	Coronal
SA ST	THIN ST	Manual	Average	180/25	3	1.5	Sagittal

Networking

- All Images to PACS (ALI_Store).
- Note: if smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

Miscellaneous

Choose the CT scan factors on the scanner for the proper age range of the patient:

- Adult: (>= 18 years)
- Adolescent: (7 - 17 years)
- Child: (3 – 6 years)
- Infant: (0 – 2 years)

Acquisition Parameters

Series 1, Scout

	Adult
Scout 1 kV	**120**
Scout 1 mA	**10**
Scout 1 Angle	**180**
Scout 2 kV	**120**
Scout 2 mA	**20**
Scout 2 Angle	**90**
WW/WL for Scout	**500/50**

Series 2, Scan Phase

	Adult
Scan Type	**Axial**
Beam Collimation	**10**
Detector Rows	**16.0**
Detector Configuration	**16x0.625**
Scan FOV	**Head**
Pitch	**1**
Speed (mm/rot)	**10.00**
Rotation Time (s)	**0.8**
kV	**120**
AEC type	**Manual mA**
mA Range	**(150-520)**
Manual mA	**370.0**
Noise Index	**3.4**
Slice Thickness (mm)	**5**
Interval (mm)	**10**

Series 2, Recons

	Adult
Recon 1 (Primary)	
DFOV	**22**
Recon Type	**Soft**
WW/WL	**80/25**
Recon Option	**Full**
Recon Option	
ASiR/ASiR256/DLIR	**60% / 30% / High**
Slice Thickness (mm)	**5.0**
Interval (mm)	**N/A**
Recon 2 (Secondary)	
DFOV	**22**
Recon Type	**Bone Plus**
WW/WL	**2500/350**
Recon Option	**Full**
Recon Option	
ASiR/ASiR256/DLIR	**None**
Slice Thickness (mm)	**2.5**
Interval (mm)	**N/A**
Recon 3 (Secondary)	
DFOV	**22**
Recon Type	**Soft**
WW/WL	**180/25**
Recon Option	**Full**
Recon Option	
ASiR/ASiR256/DLIR	**80% / 40% / High**
Slice Thickness (mm)	**1.25**
Interval (mm)	**N/A**

Series 3, Scan Phase

	Adult
Scan Type	**Axial**
Beam Collimation	**10**
Detector Rows	**16.0**
Detector Configuration	**16x0.625**
Scan FOV	**Head**
Pitch	**1**
Speed (mm/rot)	**10.00**
Rotation Time (s)	**1**
kV	**100**
AEC type	**Manual mA**
mA Range	**(150-480)**
Manual mA	**380.0**
Noise Index	**4.4**
Slice Thickness (mm)	**5**
Interval (mm)	**10**

Series 3, Recons

	Adult
Recon 1 (Primary)	
DFOV	**22**
Recon Type	**Soft**
WW/WL	**80/25**
Recon Option	**Full**
Recon Option	
ASiR/ASiR256/DLIR	**60% / 30% / High**
Slice Thickness (mm)	**5.0**
Interval (mm)	**N/A**
Recon 2 (Secondary)	
DFOV	**22**
Recon Type	**Bone Plus**
WW/WL	**2500/350**
Recon Option	**Full**
Recon Option	
ASiR/ASiR256/DLIR	**None**
Slice Thickness (mm)	**2.5**
Interval (mm)	**N/A**
Recon 3 (Secondary)	
DFOV	**22**
Recon Type	**Soft**
WW/WL	**180/25**
Recon Option	**Full**
Recon Option	
ASiR/ASiR256/DLIR	**80% / 40% / High**
Slice Thickness (mm)	**1.25**
Interval (mm)	**N/A**

3D CT (Craniosynostosis, Congenital Facial Anomaly) 1.5

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Indication

Craniosynostosis, Cleft lip, Cleft Palate, septo-optic dysplasia

Oral Contrast

None

Pre-Scan Instructions

- Patient Supine, PA and lateral scouts, no gantry angle
- Remove all metallic and high-density objects from the scanning area.
- Patient Positioning: Tilt the patient's head so that a line connecting the lateral canthus and the EAC is perpendicular to the CT tabletop. (see head CT protocol)

IV Contrast Parameters

Only done without contrast.

Field of View

Preferred 22 cm (Must include the entire head, face, and mandible)

Scan Description

- Series 1 – Scouts PA and Lateral
- Series 2 – Crainio: Start just below the mandible and scan all the way through the top of the head (Get 1-2 air scans above the head and below the chin to allow the 3D program to show the entire head and mandible without artifacts)

Reformat Instructions

No reformats unless requested by a Radiologist

Reformats

None.

Networking

- All Images to PACS (ALI_Store).
- Note: if smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

Miscellaneous

Choose the CT scan factors on the scanner for the proper age range of the patient:

- Adult: (>= 18 years)

- Adolescent: (7 - 17 years)
- Child: (3 – 6 years)
- Infant: (0 – 2 years)

Acquisition Parameters

Series 1, Scout

	Adult
Scout 1 kV	**120**
Scout 1 mA	**10**
Scout 1 Angle	**180**
Scout 2 kV	**120**
Scout 2 mA	**20**
Scout 2 Angle	**90**
WW/WL for Scout	**500/50**

Series 2, Scan Phase

	Adult
Scan Type	**Helical**
Beam Collimation	**20**
Detector Rows	**32.0**
Detector Configuration	**32x0.625**
Scan FOV	**Head**
Pitch	**0.531**
Speed (mm/rot)	**10.60**
Rotation Time (s)	**0.5**
kV	**120**
AEC type	**smart mA**
mA Range	**(130-440)**
Manual mA	**210.0**
Noise Index	**3.4**
Slice Thickness (mm)	**5**
Interval (mm)	**3.0**

Series 2, Recons

	Adult
Recon 1 (Primary)	
DFOV	**22**
Recon Type	**Soft**
WW/WL	**80/25**
Recon Option	**Plus**
Recon Option	
ASiR/ASiR256/DLIR	**60% / 30% / Medium**
Slice Thickness (mm)	**5.0**
Interval (mm)	**3.0**
Recon 2 (Secondary)	
DFOV	**22**
Recon Type	**Bone Plus**
WW/WL	**2500/350**
Recon Option	**Plus**
Recon Option	
ASiR/ASiR256/DLIR	**None**
Slice Thickness (mm)	**1.25**
Interval (mm)	**0.625**
Recon 3 (Secondary)	
DFOV	**22**
Recon Type	**Soft**
WW/WL	**180/25**
Recon Option	**Plus**
Recon Option	**IQ Enhance**
ASiR/ASiR256/DLIR	**80% / 40% / High**
Slice Thickness (mm)	**0.625**
Interval (mm)	**0.312**

16 & 32 Slice Scanner Exceptions:

1. The 0.625mm slice thickness x 0.312mm interval Recon should be 1.25mm slice thickness x 0.625mm interval on 16 and 32 slice CT scanners. The 16 and 32 slice scanners are only able to recon down to 0.625mm slice thickness when using 10mm and/or 20mm beam collimation respectively. However, when using 20mm and/or 40mm beam collimation, they are only capable of reconstructing to 1.25mm slice thickness.
2. MARS feature is not an option.
3. IQ Enhance feature requires thin slices (1.25mm or less) with an interval of half (or less). On older scanner models, in order to enable IQ Enhance at 0.625 mm slice thickness, the interval must be set to 0.311 mm instead of 0.312 mm.

DLIR Limitations:

1. DLIR is not available on the Primary Recon.
2. DLIR is only compatible with the Standard Algorithm. So, in instances where the primary recon is Soft algorithm,(i.e. many Neuro Protocols) the subsequent recons will be in Standard Algorithm to enable DLIR. The slight difference between the Soft and Standard Algorithms is outweighed by the improvement in image quality with DLIR enabled.
3. DLIR requires an interval exactly half of the slice thickness.
4. DLIR doesn't allow an interval of 0.312 mm. So, if you are on a DLIR enabled scanner, the thin 0.625 recon will be at 0.625x0.625 mm. On all other scanners the thin recon will be at 0.625x0.312 mm.

Stroke Deluxe – Total Cerebrovascular 1.6

If you get an order for Perfusion only, please still scan the Without contrast and With contrast Head along with the Perfusion. Skip the CTA Head/Neck series.

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Indication

Stroke, mental status change, dissection, arterial embolism

Videos for this protocol

Stroke Deluxe

Perfusion

Oral Contrast

None

Pre-Scan Instructions

- Start an 18g right sided IV. If it is a stroke code and an IV is already placed, please do not re-stick the patient.
- Extend the scouts to include the aortic arch for smart prep.
- Patient Positioning: Tilt the patient's head so that a line connecting the lateral canthus of the eye and the EAC is perpendicular to the CT tabletop (see head CT protocol).
- Remove all metallic and high-density objects from the scanning area.

IV Contrast Parameters 350

Select Ulrich protocols 4-9

Adult CTA

Weight Ranges	Contrast Dosage	Injection Rate
<200 lbs. (<90 kg)	85 mL of Iohexol 350 mgI/mL + 50 mL NaCl flush	4 mL/sec
200-300 lbs (90-136 kg)	106 mL of Iohexol 350 mgI/mL + 50 mL NaCl flush	5 mL/sec
>300 lbs (>136 kg)	127 mL of Iohexol 350 mgI/mL + 50 mL NaCl flush	5 mL/sec

Neuro Adult CTA Perfusion Phase

Weight Ranges	Contrast Dosage	Injection Rate
<200 lbs. (<90 kg)	42 mL of Iohexol 350 mgI/mL + 30 mL NaCl flush	5 mL/sec
200-300 lbs (90-136 kg)	53 mL of Iohexol 350 mgI/mL + 30 mL NaCl flush	5.5 mL/sec
>300 lbs (>136 kg)	53 mL of Iohexol 350 mgI/mL + 30 mL NaCl flush	5.5 mL/sec

IV Contrast Parameters 300/370

Adult CTA

Weight Ranges	Contrast Dosage	Injection Rate
<200 lbs. (<90 kg)	80 mL of Iopamidol 370 mgI/mL (Isovue) + 50 mL NaCl flush	4 mL/sec
200-300 lbs (90-136 kg)	100 mL of Iopamidol 370 mgI/mL (Isovue) + 50 mL NaCl flush	5 mL/sec
>300 lbs (>136 kg)	120 mL of Iopamidol 370 mgI/mL (Isovue) + 50 mL NaCl flush	5 mL/sec

Neuro Adult CTA Perfusion Phase

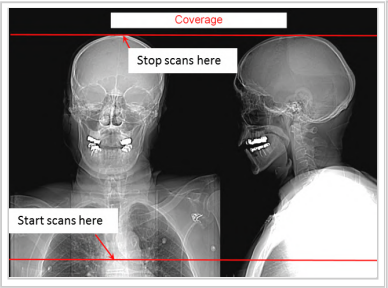
Weight Ranges	Contrast Dosage	Injection Rate
<200 lbs. (<90 kg)	40 mL of Iopamidol 370 mgI/mL (Isovue) + 30 mL NaCl flush	5 mL/sec
200-300 lbs (90-136 kg)	50 mL of Iopamidol 370 mgI/mL (Isovue) + 30 mL NaCl flush	5.5 mL/sec
>300 lbs (>136 kg)	50 mL of Iopamidol 370 mgI/mL (Isovue) + 30 mL NaCl flush	5.5 mL/sec

Field of View

Preferred 22 cm

Scan Description

- **Series 1** – Scouts PA and Lateral
- **Series 2** – Routine CT Head without contrast (Helical)
- **Series 3** - CTA Head and Neck: Scan from bottom of carina to the top of head (bottom up)
  - Smart Prep: Aortic arch (initiate the scan at contrast entry)

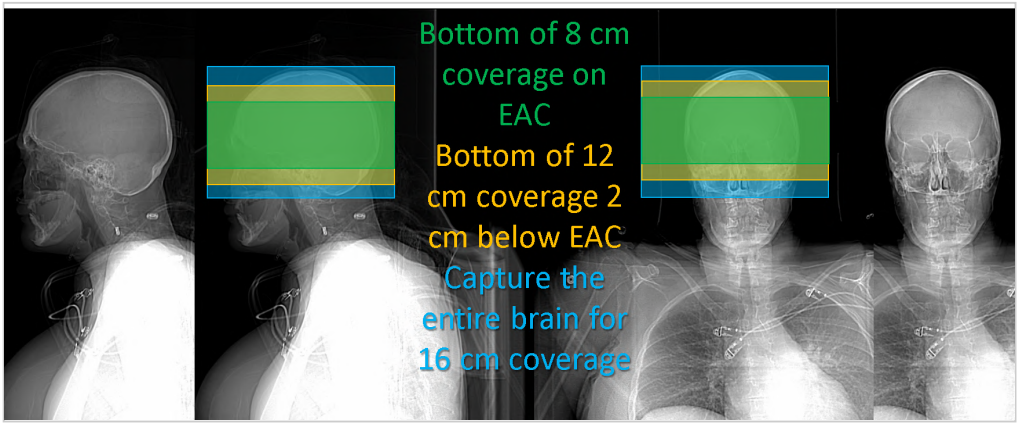


- **Series 4** – CT Perfusion:
  - Coverage - Bottom of scan range should start at the EAC (if doing axial, see perfusion levels in the supplemental perfusion information)

When to Scan Perfusion Series	
Scenario	**Delay**
If a Stroke Code:	**Wait 30 seconds after CTA to begin**
If a Non-Emergent case:	**Wait 5 mins from start of CTA injection**

- **Series 5** – Routine Head With contrast (Helical): Must be done AFTER perfusion. Delay allows more enhancement of lesions, but this is out-weighed by the necessity for urgency in a Stroke Code.

When to Scan Head with Series	
Scenario	**Delay**
If a Stroke Code:	**Start immediately after perfusion**
If a Non-Emergent case:	**Start immediately after perfusion**
If Stroke Code (no perfusion):	**Start 30 seconds after CTA injection**
If Non- Emergent (no perfusion):	**Wait 5 mins from start of CTA injection**



Perfusion Coverage Guidance. If a "whole brain" coverage is ordered, use the 16 cm coverage. Note, on non Rev256 scanners, you will only have 8 cm of coverage (i.e. shuttle mode). All three protocols will have the same scan time, approximately 60 seconds. 80 mm coverage = 352 images, 120 mm coverage = 528 images and 160 mm coverage = 704 images.

Reformat Instructions

Please send all images to PACS before starting reformats. See table below for reformat instructions.

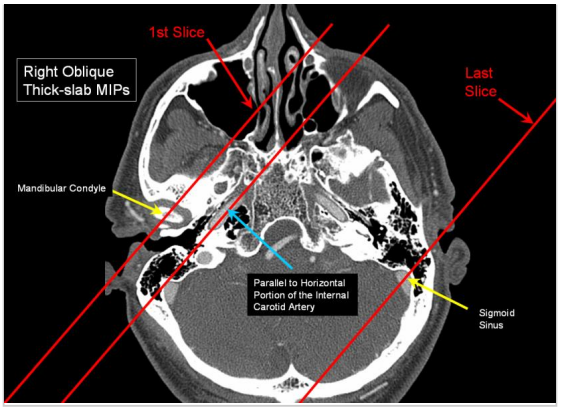
In the United States, CT Angiography CPT codes require the performance and documentation of 3D angiographic rendering, which may include maximum intensity projection (MIP), volumetric rendering, and/or surface rendering techniques.

Reformats

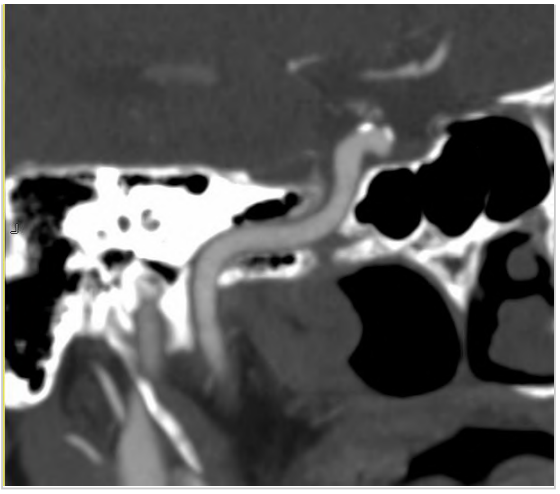
Thin MIP 2D-Reformations through the vertebral and carotid arteries

- Make sure the reference line is parallel to the carotid canal (see image below)
- Axial images to use for obtaining the oblique sagittal 2-D Reformations
- Use a DFOV of 10

Send to ALI Store (PACS)



Where to take reformats



What reformats should look like

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
RT OBL	Thin ST	Manual	MIP	800/200	1	1	Axial
LT OBL	Thin ST	Manual	MIP	800/200	1	1	Axial

2D Thick-Slab MIP Reformats of Head

- Do axial, sagittal, and coronal thick-slab MIPs through the entire head. (See examples below)

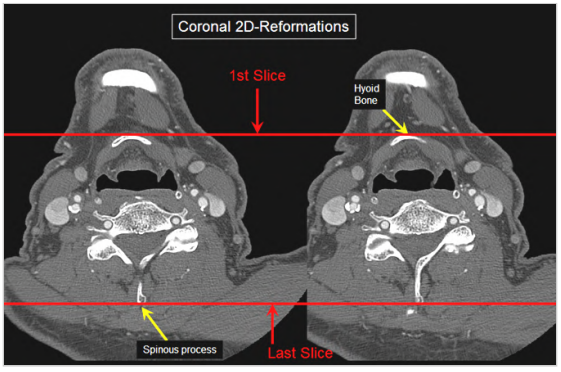
Send to ALI Store (PACS).

What reformats should look like

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
AX	Thin ST	Manual	MIP	600/200	10	2.5	axial
SA	Thin ST	Manual	MIP	600/200	10	2.5	sagittal
CO	Thin ST	Manual	MIP	600/200	10	2.5	coronal

2D MIP-Reformations through the vertebral and carotid arteries

- Use an axial image near the level of the hyoid bone at the carotid bifurcation to prescribe the correct oblique angles. Use an image that shows the external and internal carotid arteries.
- Choose only the axial images from the aortic arch to the EAC.
- Include both the carotid and vertebral arteries (See example below)
- Send all images to ALI Store(PACS).



Coronal and Sagittal 2D- MIP Reformats
Through Carotid Bifurcations

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
SA	Thin ST	Manual	MIP	800/200	10	2.5	sagittal
CO	Thin ST	Manual	MIP	800/200	10	2.5	coronal
SA ST	Thin ST	Manual	Average	300/35	3	1.5	Sagittal

Networking

- All Images to PACS (ALI_Store).

- Thin ST CTA is auto-networked to CTAW1/ 3D lab.
- Perfusion is set up to auto send to RAPID (outside facilities send to your own stroke processing software solution).
- Do not wait until the end of the exam to start sending images to PACS if the case is emergent, please send series as soon as they are reconstructed and send images as you reformat them to get the stroke care team images asap.
- Note: if smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

All MAR recons and reformats should be sent to PACS (ALI_Store). Label MAR reformats with the word "MAR" at the end, for example "CO ST MAR".

Miscellaneous

Choose the CT scan factors on the scanner for the proper age range of the patient:

- Adult: (>= 18 years)
- Adolescent: (7 - 17 years)
- Child: (3 – 6 years)
- Infant: (0 – 2 years)

Acquisition Parameters

Series 1, Scout

	Adult
Scout 1 kV	**120**
Scout 1 mA	**10**
Scout 1 Angle	**180**
Scout 2 kV	**120**
Scout 2 mA	**20**
Scout 2 Angle	**90**
WW/WL for Scout	**500/50**

Series 2, Scan Phase

	Adult
Scan Type	**Helical**
Beam Collimation	**20**
Detector Rows	**32.0**
Detector Configuration	**32x0.625**
Scan FOV	**Head**
Pitch	**0.531**
Speed (mm/rot)	**10.60**
Rotation Time (s)	**0.5**
kV	**120**
AEC type	**smart mA**
mA Range	**(130-440)**
Manual mA	**210.0**
Noise Index	**3.4**
Slice Thickness (mm)	**5**
Interval (mm)	**3.0**

Series 2, Recons

	Adult
Recon 1 (Primary)	
DFOV	**22**
Recon Type	**Soft**
WW/WL	**80/25**
Recon Option	**Plus**
Recon Option	
ASiR/ASiR256/DLIR	**60% / 30% / Medium**
Slice Thickness (mm)	**5.0**
Interval (mm)	**3.0**
Recon 2 (Secondary)	
DFOV	**22**
Recon Type	**Bone Plus**
WW/WL	**2500/350**
Recon Option	**Plus**
Recon Option	
ASiR/ASiR256/DLIR	**None**
Slice Thickness (mm)	**2.5**
Interval (mm)	**1.5**
Recon 3 (Secondary)	
DFOV	**22**
Recon Type	**Soft**
WW/WL	**180/25**
Recon Option	**Plus**
Recon Option	**IQ Enhance**
ASiR/ASiR256/DLIR	**80% / 40% / High**
Slice Thickness (mm)	**1.25**
Interval (mm)	**0.625**

Series 3, Smart Prep

	Adult
mA	**80**
Monitoring Delay (sec)	**10**
Monitoring ISD (sec)	**2**
Enhancement Threshold (HU)	**40**
Diagnostic Delay	**Auto Minimum**

Series 3, Scan Phase

	Adult
Scan Type	**Helical**
Beam Collimation	**40**
Detector Rows	**64.0**
Detector Configuration	**64x0.625**
Scan FOV	**Large Body**
Pitch	**0.516**
Speed (mm/rot)	**20.60**
Rotation Time (s)	**0.5**
kV	**120**
AEC type	**smart mA**
mA Range	**(240-560)**
Manual mA	**410.0**
Noise Index	**11.3**
Slice Thickness (mm)	**1.25**
Interval (mm)	**0.625**

Series 3, Recons

	Adult
Recon 1 (Primary)	
DFOV	**22**
Recon Type	**Standard**
WW/WL	**450/50**
Recon Option	**Plus**
Recon Option	**IQ Enhance**
ASiR/ASiR256/DLIR	**60% / 30% / High**
Slice Thickness (mm)	**1.25**
Interval (mm)	**0.625**
Recon 2 (Secondary)	
DFOV	**22**
Recon Type	**Bone Plus**
WW/WL	**2500/350**
Recon Option	**Plus**
Recon Option	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**
Slice Thickness (mm)	**1.25**
Interval (mm)	**0.625**
Recon 3 (Secondary)	
DFOV	**22**
Recon Type	**Standard**
WW/WL	**450/50**
Recon Option	**Plus**
Recon Option	**IQ Enhance**
Recon Option	**MARS On**
ASiR/ASiR256/DLIR	**80% / 40% / High**
Slice Thickness (mm)	**0.625**
Interval (mm)	**0.312**

DLIR Limitations:

1. DLIR is not available on the Primary Recon.
2. DLIR is only compatible with the Standard Algorithm. So, in instances where the primary recon is Soft algorithm,(i.e. many Neuro Protocols) the subsequent recons will be in Standard Algorithm to enable DLIR. The slight difference between the Soft and Standard Algorithms is outweighed by the improvement in image quality with DLIR enabled.
3. DLIR requires an interval exactly half of the slice thickness.
4. DLIR doesn't allow an interval of 0.312 mm. So, if you are on a DLIR enabled scanner, the thin 0.625 recon will be at 0.625x0.625 mm. On all other scanners the thin recon will be at 0.625x0.312 mm.

16 & 32 Slice Scanner Exceptions:

1. The 0.625mm slice thickness x 0.312mm interval Recon should be 1.25mm slice thickness x 0.625mm interval on 16 and 32 slice CT scanners. The 16 and 32 slice scanners are only able to recon down to 0.625mm slice thickness when using 10mm and/or 20mm beam collimation respectively. However, when using 20mm and/or 40mm beam collimation, they are only capable of reconstructing to 1.25mm slice thickness.
2. MARS feature is not an option.
3. IQ Enhance feature requires thin slices (1.25mm or less) with an interval of half (or less). On older scanner models, in order to enable IQ Enhance at 0.625 mm slice thickness, the interval must be set to 0.311 mm instead of 0.312 mm.

Series 4, Perfusion

Perfusion Details can be found on the perfusion appendix page

Series 5, Scan Phase

	Adult
Scan Type	**Helical**
Beam Collimation	**20**
Detector Rows	**32.0**
Detector Configuration	**32x0.625**
Scan FOV	**Head**
Pitch	**0.531**
Speed (mm/rot)	**10.60**
Rotation Time (s)	**0.6**
kV	**100**
AEC type	**smart mA**
mA Range	**(130-450)**
Manual mA	**230.0**
Noise Index	**4.0**
Slice Thickness (mm)	**5**
Interval (mm)	**3.0**

Series 5, Recons

	Adult
Recon 1 (Primary)	
DFOV	**22**
Recon Type	**Soft**
WW/WL	**80/25**
Recon Option	**Plus**
Recon Option	
ASiR/ASiR256/DLIR	**60% / 30% / Medium**
Slice Thickness (mm)	**5.0**
Interval (mm)	**3.0**

CTA Head Only (Stenosis, Aneurysm, Unknown Bleed) 1.7

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Indication

Stenosis, Aneurysm, Unknown Bleed

(If an order is asking for both a CTA and a CTV, please scan only the CTV, do not scan both.)

Videos for this protocol

CTA Head and Neck

Perfusion

Oral Contrast

None

Pre-Scan Instructions

- Start an 18g right sided IV. If it is a stroke code and an IV is already placed, please do not re-stick the patient.
- Extend the scouts to include the aortic arch for smart prep.
- Patient Positioning: Tilt the patient's head so that a line connecting the lateral canthus of the eye and the EAC is perpendicular to the CT tabletop (see head CT protocol).
- Remove all metallic and high-density objects from the scanning area.

IV Contrast Parameters 350

Select Ulrich protocols 4-9

Adult CTA

Weight Ranges	Contrast Dosage	Injection Rate
<200 lbs. (<90 kg)	85 mL of Iohexol 350 mgI/mL + 50 mL NaCl flush	4 mL/sec
200-300 lbs (90-136 kg)	106 mL of Iohexol 350 mgI/mL + 50 mL NaCl flush	5 mL/sec
>300 lbs (>136 kg)	127 mL of Iohexol 350 mgI/mL + 50 mL NaCl flush	5 mL/sec

Neuro Adult CTA Perfusion Phase

Weight Ranges	Contrast Dosage	Injection Rate
<200 lbs. (<90 kg)	42 mL of Iohexol 350 mgI/mL + 30 mL NaCl flush	5 mL/sec
200-300 lbs (90-136 kg)	53 mL of Iohexol 350 mgI/mL + 30 mL NaCl flush	5.5 mL/sec
>300 lbs (>136 kg)	53 mL of Iohexol 350 mgI/mL + 30 mL NaCl flush	5.5 mL/sec

IV Contrast Parameters 300/370

Adult CTA

Weight Ranges	Contrast Dosage	Injection Rate
<200 lbs. (<90 kg)	80 mL of Iopamidol 370 mgI/mL (Isovue) + 50 mL NaCl flush	4 mL/sec
200-300 lbs (90-136 kg)	100 mL of Iopamidol 370 mgI/mL (Isovue) + 50 mL NaCl flush	5 mL/sec
>300 lbs (>136 kg)	120 mL of Iopamidol 370 mgI/mL (Isovue) + 50 mL NaCl flush	5 mL/sec

Neuro Adult CTA Perfusion Phase

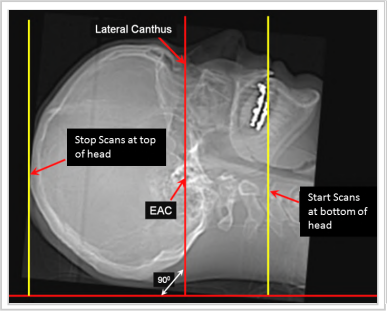
Weight Ranges	Contrast Dosage	Injection Rate
<200 lbs. (<90 kg)	40 mL of Iopamidol 370 mgI/mL (Isovue) + 30 mL NaCl flush	5 mL/sec
200-300 lbs (90-136 kg)	50 mL of Iopamidol 370 mgI/mL (Isovue) + 30 mL NaCl flush	5.5 mL/sec
>300 lbs (>136 kg)	50 mL of Iopamidol 370 mgI/mL (Isovue) + 30 mL NaCl flush	5.5 mL/sec

Field of View

Preferred 22 cm

Scan Description

- **Series 1** – Scouts PA and Lateral
- **Series 2** – Routine CT Head without contrast (Helical)
- **Series 3** - CTA Head Only: Scan from bottom of C2 to the top of head (bottom up)
  - Smart Prep: Aortic arch (initiate the scan at contrast entry)

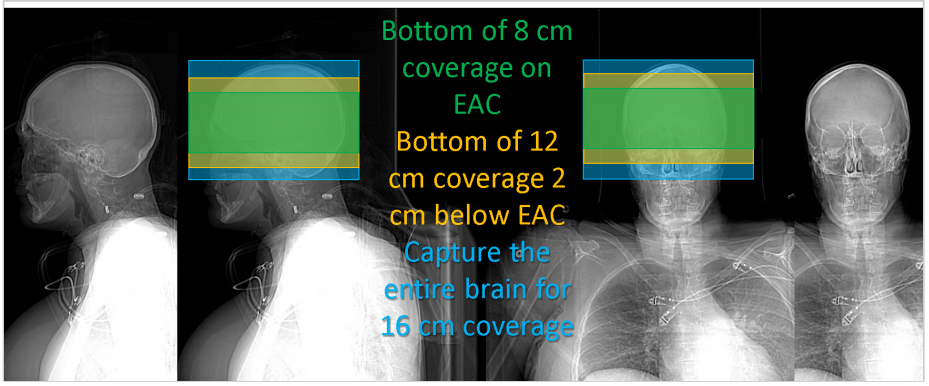


- **Series 4** – CT Perfusion:
- Coverage - Bottom of scan range should start at the EAC (if doing axial, see perfusion levels in the supplemental perfusion information)

When to Scan Perfusion Series	
Scenario	**Delay**
If a Stroke Code:	**Wait 30 seconds after CTA to begin**
If a Non-Emergent case:	**Wait 5 mins from start of CTA injection**

- **Series 5** – Routine Head With contrast (Helical): Must be done AFTER perfusion. Delay allows more enhancement of lesions, but this is out-weighed by the necessity for urgency in a Stroke Code.

When to Scan Head with Series	
Scenario	**Delay**
If a Stroke Code:	**Start immediately after perfusion**
If a Non-Emergent case:	**Start immediately after perfusion**
If Stroke Code (no perfusion):	**Start 30 seconds after CTA injection**
If Non- Emergent (no perfusion):	**Wait 5 mins from start of CTA injection**



Perfusion Coverage Guidance. If a "whole brain" coverage is ordered, use the 16 cm coverage. Note, on non Rev256 scanners, you will only have 8 cm of coverage (i.e. shuttle mode).

Reformat Instructions

Please send all images to PACS before starting reformats. See table below for reformat instructions.

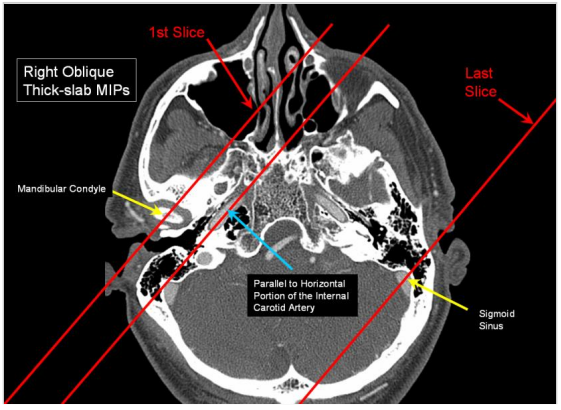
In the United States, CT Angiography CPT codes require the performance and documentation of 3D angiographic rendering, which may include maximum intensity projection (MIP), volumetric rendering, and/or surface rendering techniques.

Reformats

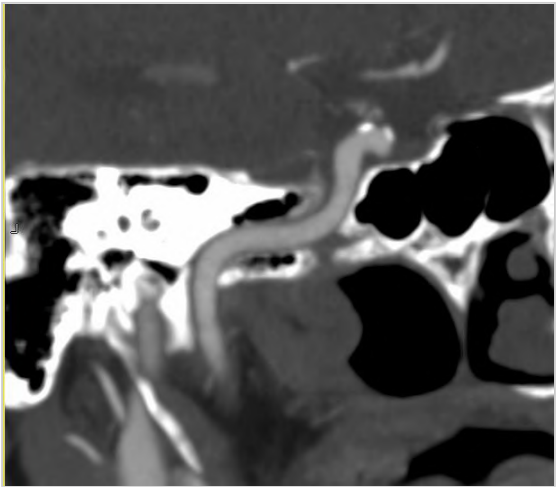
Thin MIP 2D-Reformations through the vertebral and carotid arteries

- Make sure the reference line is parallel to the carotid canal (see image below)
- Axial images to use for obtaining the oblique sagittal 2-D Reformations
- Use a DFOV of 10

Send to ALI Store (PACS)



Where to take reformats



What reformats should look like

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
RT OBL	Thin ST	Manual	MIP	800/200	1	1	Axial
LT OBL	Thin ST	Manual	MIP	800/200	1	1	Axial

2D Thick-Slab MIP Reformats of Head

Do axial, sagittal, and coronal thick-slab MIPs through the entire head. (See examples below)

Send to ALI Store (PACS).

What reformats should look like

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
AX	Thin ST	Manual	MIP	600/200	10	2.5	axial
SA	Thin ST	Manual	MIP	600/200	10	2.5	sagittal
CO	Thin ST	Manual	MIP	600/200	10	2.5	coronal

Networking

- All Images to PACS (ALI_Store).
- Thin ST CTA is auto-networked to CTAW1/ 3D lab.
- Perfusion is set up to auto send to RAPID (outside facilities send to your own stroke processing software solution).
- Do not wait until the end of the exam to start sending images to PACS if the case is emergent, please send series as soon as they are reconstructed and send images as you reformat them to get the stroke care team images asap.
- Note: if smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

All MAR recons and reformats should be sent to PACS (ALI_Store). Label MAR reformats with the word "MAR" at the end, for example "CO ST MAR".

Miscellaneous

Choose the CT scan factors on the scanner for the proper age range of the patient:

- Adult: (>= 18 years)
- Adolescent: (7 - 17 years)
- Child: (3 – 6 years)
- Infant: (0 – 2 years)

Acquisition Parameters

Series 1, Scout

	Adult
Scout 1 kV	120
Scout 1 mA	10
Scout 1 Angle	180
Scout 2 kV	120
Scout 2 mA	20
Scout 2 Angle	90
WW/WL for Scout	500/50

Series 2, Scan Phase

	Adult
Scan Type	**Helical**
Beam Collimation	**20**
Detector Rows	**32.0**
Detector Configuration	**32x0.625**
Scan FOV	**Head**
Pitch	**0.531**
Speed (mm/rot)	**10.60**
Rotation Time (s)	**0.5**
kV	**120**
AEC type	**smart mA**
mA Range	**(130-440)**
Manual mA	**210.0**
Noise Index	**3.4**
Slice Thickness (mm)	**5**
Interval (mm)	**3.0**

Series 2, Recons

	Adult
Recon 1 (Primary)	
DFOV	**22**
Recon Type	**Soft**
WW/WL	**80/25**
Recon Option	**Plus**
Recon Option	
ASiR/ASiR256/DLIR	**60% / 30% / Medium**
Slice Thickness (mm)	**5.0**
Interval (mm)	**3.0**
Recon 2 (Secondary)	
DFOV	**22**
Recon Type	**Bone Plus**
WW/WL	**2500/350**
Recon Option	**Plus**
Recon Option	
ASiR/ASiR256/DLIR	**None**
Slice Thickness (mm)	**2.5**
Interval (mm)	**1.5**
Recon 3 (Secondary)	
DFOV	**22**
Recon Type	**Soft**
WW/WL	**180/25**
Recon Option	**Plus**
Recon Option	**IQ Enhance**
ASiR/ASiR256/DLIR	**80% / 40% / High**
Slice Thickness (mm)	**1.25**
Interval (mm)	**0.625**

Series 3, Smart Prep

	Adult
mA	**80**
Monitoring Delay (sec)	**10**
Monitoring ISD (sec)	**2**
Enhancement Threshold (HU)	**40**
Diagnostic Delay	**Auto Minimum**

Series 3, Scan Phase

	Adult
Scan Type	**Helical**
Beam Collimation	**20**
Detector Rows	**32.0**
Detector Configuration	**32x0.625**
Scan FOV	**Head**
Pitch	**0.531**
Speed (mm/rot)	**10.60**
Rotation Time (s)	**0.6**
kV	**100**
AEC type	**smart mA**
mA Range	**(130-450)**
Manual mA	**230.0**
Noise Index	**8.0**
Slice Thickness (mm)	**1.25**
Interval (mm)	**0.625**

Series 3, Recons

	Adult
Recon 1 (Primary)	
DFOV	**22**
Recon Type	**Standard**
WW/WL	**450/50**
Recon Option	**Plus**
Recon Option	**IQ Enhance**
ASiR/ASiR256/DLIR	**60% / 30% / High**
Slice Thickness (mm)	**1.25**
Interval (mm)	**0.625**
Recon 2 (Secondary)	
DFOV	**22**
Recon Type	**Bone Plus**
WW/WL	**2500/350**
Recon Option	**Plus**
Recon Option	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**
Slice Thickness (mm)	**1.25**
Interval (mm)	**0.625**
Recon 3 (Secondary)	
DFOV	**22**
Recon Type	**Standard**
WW/WL	**450/50**
Recon Option	**Plus**
Recon Option	**IQ Enhance**
ASiR/ASiR256/DLIR	**80% / 40% / High**
Slice Thickness (mm)	**0.625**
Interval (mm)	**0.312**

DLIR Limitations:

1. DLIR is not available on the Primary Recon.
2. DLIR is only compatible with the Standard Algorithm. So, in instances where the primary recon is Soft algorithm,(i.e. many Neuro Protocols) the subsequent recons will be in Standard Algorithm to enable DLIR. The slight difference between the Soft and Standard Algorithms is outweighed by the improvement in image quality with DLIR enabled.
3. DLIR requires an interval exactly half of the slice thickness.
4. DLIR doesn't allow an interval of 0.312 mm. So, if you are on a DLIR enabled scanner, the thin 0.625 recon will be at 0.625x0.625 mm. On all other scanners the thin recon will be at 0.625x0.312 mm.

16 & 32 Slice Scanner Exceptions:

1. The 0.625mm slice thickness x 0.312mm interval Recon should be 1.25mm slice thickness x 0.625mm interval on 16 and 32 slice CT scanners. The 16 and 32 slice scanners are only able to recon down to 0.625mm slice thickness when using 10mm and/or 20mm beam collimation respectively. However, when using 20mm and/or 40mm beam collimation, they are only capable of reconstructing to 1.25mm slice thickness.
2. MARS feature is not an option.
3. IQ Enhance feature requires thin slices (1.25mm or less) with an interval of half (or less). On older scanner models, in order to enable IQ Enhance at 0.625 mm slice thickness, the interval must be set to 0.311 mm instead of 0.312 mm.

Series 4, Perfusion

Perfusion Details can be found on the perfusion appendix page

Series 5, Scan Phase

	Adult
Scan Type	**Helical**
Beam Collimation	**20**
Detector Rows	**32.0**
Detector Configuration	**32x0.625**
Scan FOV	**Head**
Pitch	**0.531**
Speed (mm/rot)	**10.60**
Rotation Time (s)	**0.6**
kV	**100**
AEC type	**smart mA**
mA Range	**(130-450)**
Manual mA	**230.0**
Noise Index	**4.0**
Slice Thickness (mm)	**5**
Interval (mm)	**3.0**

Series 5, Recons

	Adult
Recon 1 (Primary)	
DFOV	**22**
Recon Type	**Soft**
WW/WL	**80/25**
Recon Option	**Plus**
Recon Option	
ASiR/ASiR256/DLIR	**60% / 30% / Medium**
Slice Thickness (mm)	**5.0**
Interval (mm)	**3.0**

CT Venography Head & Neck 1.9

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Indication

Venous Sinus Thrombosis

If an order is asking for both a CTA and a CTV, please scan only the CTV, do not scan both.

Oral Contrast

None

Pre-Scan Instructions

- Extend the scouts to include the aortic arch for smart prep.
- Patient Positioning: Tilt the patient's head so that a line connecting the lateral canthus of the eye and the EAC is perpendicular to the CT tabletop (see head CT protocol).
- Remove all metallic and high-density objects from the scanning area.

IV Contrast Parameters 350

Select Ulrich protocols 10-12

Adult

Weight Ranges	Contrast Dosage	Injection Rate
<200 lbs. (<90 kg)	103 mL Iohexol 350 mgI/mL + 50 ml NaCl flush	3.8 mL/sec
200-300 lbs (90-136 kg)	124 mL Iohexol 350 mgI/mL + 50 mL NaCl flush	4.5 mL/sec
>300 lbs (>136 kg)	129 mL Iohexol 350 mgI/mL + 50 mL NaCl flush	5 mL/sec

IV Contrast Parameters 300/370

Adult

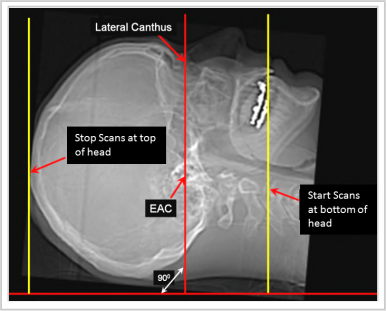
Weight Ranges	Contrast Dosage	Injection Rate
<200 lbs. (<90 kg)	120 mL Iohexol 300 mgI/mL + 50 ml NaCl flush	3.8 mL/sec
200-300 lbs (90-136 kg)	145 mL Iohexol 300 mgI/mL + 50 mL NaCl flush	4.5 mL/sec
>300 lbs (>136 kg)	150 mL Iohexol 300 mgI/mL + 50 mL NaCl flush	5 mL/sec

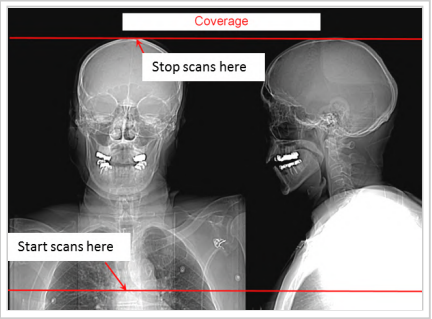
Field of View

Preferred 22 cm

Scan Description

- **Series 1** – Scouts PA and Lateral
- **Series 2** – Routine CT Head without contrast (Helical)
- **Series 3** - CTV Head Only -OR- CTV Head and Neck
- CTV Head Only: Scan from bottom of C2 to the top of head (bottom up)
- CTV Head and Neck: Scan from carina to top of head (bottom up)
    - Timing: There is a 7 second diagnostic delay built into the smart prep.
    - Smart Prep: Place ROI on aortic arch





- **Series 4** – Routine Head With contrast (Helical): Wait at least 5 min from start of CTV contrast injection before beginning scan.

Reformat Instructions

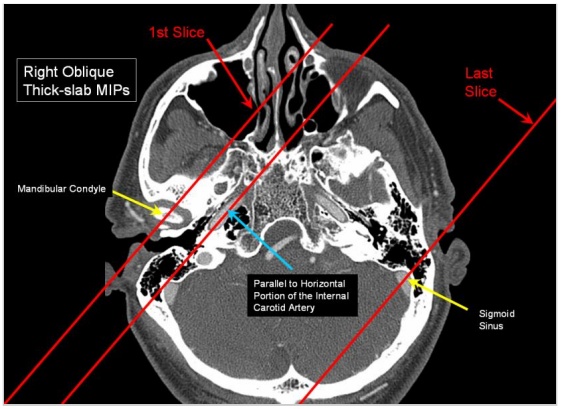
Please send all images to PACS before starting reformats. See table below for reformat instructions.

Reformats

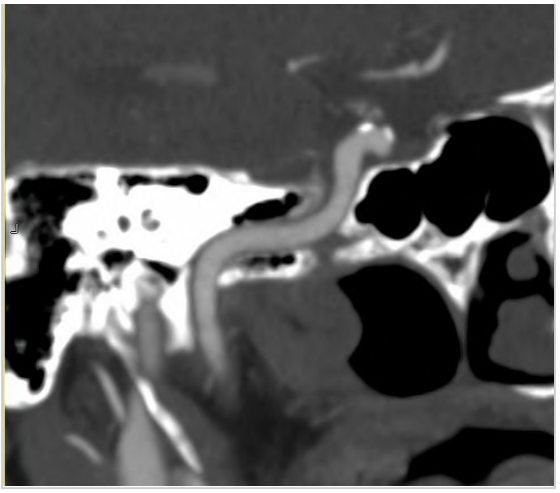
Thin MIP 2D-Reformations through the vertebral and carotid arteries

- Make sure the reference line is parallel to the carotid canal (see image below)
- Axial images to use for obtaining the oblique sagittal 2-D Reformations
- Use a DFOV of 10

Send to ALI Store (PACS)



Where to take reformats



What reformats should look like

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
RT OBL	Thin ST	Manual	MIP	800/200	1	1	Axial
LT OBL	Thin ST	Manual	MIP	800/200	1	1	Axial

2D Thick-Slab MIP Reformats of Head

- Do axial, sagittal, and coronal thick-slab MIPs through the entire head. (See examples below)

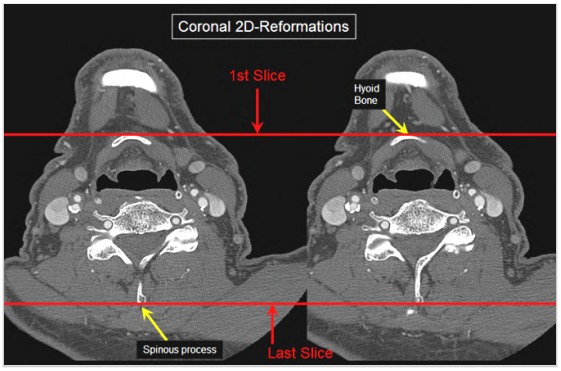
Send to ALI Store (PACS).

What reformats should look like

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
AX	Thin ST	Manual	MIP	600/200	10	2.5	axial
SA	Thin ST	Manual	MIP	600/200	10	2.5	sagittal
CO	Thin ST	Manual	MIP	600/200	10	2.5	coronal

2D MIP-Reformations through the vertebral and carotid arteries

- Use an axial image near the level of the hyoid bone at the carotid bifurcation to prescribe the correct oblique angles. Use an image that shows the external and internal carotid arteries.
- Choose only the axial images from the aortic arch to the EAC.
- Include both the carotid and vertebral arteries (See example below)
- Send all images to ALI Store(PACS).



Coronal and Sagittal 2D- MIP Reformats
Through Carotid Bifurcations

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
SA	Thin ST	Manual	MIP	800/200	10	2.5	sagittal
CO	Thin ST	Manual	MIP	800/200	10	2.5	coronal
SA ST	Thin ST	Manual	Average	300/35	3	1.5	Sagittal

Networking

- All Images to PACS (ALI_Store).
- Note: if smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

All MAR recons and reformats should be sent to PACS (ALI_Store). Label MAR reformats with the word "MAR" at the end, for example "CO ST MAR".

Miscellaneous

Choose the CT scan factors on the scanner for the proper age range of the patient:

- Adult: (>= 18 years)
- Adolescent: (7 - 17 years)
- Child: (3 – 6 years)
- Infant: (0 – 2 years)

Acquisition Parameters

Series 1, Scout

	Adult
Scout 1 kV	120
Scout 1 mA	10
Scout 1 Angle	180
Scout 2 kV	120
Scout 2 mA	20
Scout 2 Angle	90
WW/WL for Scout	500/50

Series 2, Scan Phase

	Adult
Scan Type	**Helical**
Beam Collimation	**20**
Detector Rows	**32.0**
Detector Configuration	**32x0.625**
Scan FOV	**Head**
Pitch	**0.531**
Speed (mm/rot)	**10.60**
Rotation Time (s)	**0.5**
kV	**120**
AEC type	**smart mA**
mA Range	**(130-440)**
Manual mA	**210.0**
Noise Index	**3.4**
Slice Thickness (mm)	**5**
Interval (mm)	**3.0**

Series 2, Recons

	Adult
Recon 1 (Primary)	
DFOV	**22**
Recon Type	**Soft**
WW/WL	**80/25**
Recon Option	**Plus**
Recon Option	
ASiR/ASiR256/DLIR	**60% / 30% / Medium**
Slice Thickness (mm)	**5.0**
Interval (mm)	**3.0**
Recon 2 (Secondary)	
DFOV	**22**
Recon Type	**Bone Plus**
WW/WL	**2500/350**
Recon Option	**Plus**
Recon Option	
ASiR/ASiR256/DLIR	**None**
Slice Thickness (mm)	**2.5**
Interval (mm)	**1.5**
Recon 3 (Secondary)	
DFOV	**22**
Recon Type	**Soft**
WW/WL	**180/25**
Recon Option	**Plus**
Recon Option	**IQ Enhance**
ASiR/ASiR256/DLIR	**80% / 40% / High**
Slice Thickness (mm)	**1.25**
Interval (mm)	**0.625**

Series 3, Smart Prep

	Adult
mA	**80**
Monitoring Delay (sec)	**10**
Monitoring ISD (sec)	**3**
Enhancement Threshold (HU)	**50**
Diagnostic Delay	**7**

Series 3, Scan Phase

	Adult
Scan Type	**Helical**
Beam Collimation	**40**
Detector Rows	**64.0**
Detector Configuration	**64x0.625**
Scan FOV	**Large Body**
Pitch	**0.516**
Speed (mm/rot)	**20.60**
Rotation Time (s)	**0.5**
kV	**120**
AEC type	**smart mA**
mA Range	**(240-560)**
Manual mA	**410.0**
Noise Index	**11.3**
Slice Thickness (mm)	**1.25**
Interval (mm)	**0.625**

Series 3, Recons

	Adult
Recon 1 (Primary)	
DFOV	**22**
Recon Type	**Standard**
WW/WL	**450/50**
Recon Option	**Plus**
Recon Option	**IQ Enhance**
ASiR/ASiR256/DLIR	**60% / 30% / High**
Slice Thickness (mm)	**1.25**
Interval (mm)	**0.625**
Recon 2 (Secondary)	
DFOV	**22**
Recon Type	**Bone Plus**
WW/WL	**2500/350**
Recon Option	**Plus**
Recon Option	**IQ Enhance**
Recon Option	**None**
ASiR/ASiR256/DLIR	**1.25**
Slice Thickness (mm)	**0.625**
Interval (mm)	
Recon 3 (Secondary)	
DFOV	**22**
Recon Type	**Standard**
WW/WL	**450/50**
Recon Option	**Plus**
Recon Option	**IQ Enhance**
Recon Option	**MARS On**
ASiR/ASiR256/DLIR	**80% / 40% / High**
Slice Thickness (mm)	**0.625**
Interval (mm)	**0.312**

16 & 32 Slice Scanner Exceptions:

1. The 0.625mm slice thickness x 0.312mm interval Recon should be 1.25mm slice thickness x 0.625mm interval on 16 and 32 slice CT scanners. The 16 and 32 slice scanners are only able to recon down to 0.625mm slice thickness when using 10mm and/or 20mm beam collimation respectively. However, when using 20mm and/or 40mm beam collimation, they are only capable of reconstructing to 1.25mm slice thickness.
2. MARS feature is not an option.
3. IQ Enhance feature requires thin slices (1.25mm or less) with an interval of half (or less). On older scanner models, in order to enable IQ Enhance at 0.625 mm slice thickness, the interval must be set to 0.311 mm instead of 0.312 mm.

DLIR Limitations:

1. DLIR is not available on the Primary Recon.
2. DLIR is only compatible with the Standard Algorithm. So, in instances where the primary recon is Soft algorithm,(i.e. many Neuro Protocols) the subsequent recons will be in Standard Algorithm to enable DLIR. The slight difference between the Soft and Standard Algorithms is outweighed by the improvement in image quality with DLIR enabled.
3. DLIR requires an interval exactly half of the slice thickness.
4. DLIR doesn't allow an interval of 0.312 mm. So, if you are on a DLIR enabled scanner, the thin 0.625 recon will be at 0.625x0.625 mm. On all other scanners the thin recon will be at 0.625x0.312 mm.

Series 4, Scan Phase

	Adult
Scan Type	**Helical**
Beam Collimation	**20**
Detector Rows	**32.0**
Detector Configuration	**32x0.625**
Scan FOV	**Head**
Pitch	**0.531**
Speed (mm/rot)	**10.60**
Rotation Time (s)	**0.6**
kV	**100**
AEC type	**smart mA**
mA Range	**(130-450)**
Manual mA	**230.0**
Noise Index	**4.0**
Slice Thickness (mm)	**5**
Interval (mm)	**3.0**

Series 4, Recons

	Adult
Recon 1 (Primary)	
DFOV	**22**
Recon Type	**Soft**
WW/WL	**80/25**
Recon Option	**Plus**
Recon Option	
ASiR/ASiR256/DLIR	**60% / 30% / Medium**
Slice Thickness (mm)	**5.0**
Interval (mm)	**3.0**

Stereotactic Head 1.10

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Indication

Stereotactic guidance imaging for use in the Operating Room.

Oral Contrast

None

Pre-Scan Instructions

- Patient Supine in Stealth Head Holder. If your site does not have a Stealth Head holder, next best option is table-top, use the Head Holder only if patient cannot hold still.
- Remove all metallic and high-density objects from the scanning area.
- Be sure to include the Entire nose.
- Have the patient close their eyes for the scan.
- No gantry angle.
- Using the lasers, line up patient so that the canthomeatal line is perpendicular to the CT table. This may require you to tilt the patients head either up or down slightly.

Stealth Head Holder

IV Contrast Parameters 350

Select Ulrich Protocols 1-3

Weight Ranges	Contrast Dosage	Injection Rate
<200 lbs. (<90 kg)	103 mL Iohexol 350 mgI/mL	2 mL/sec
200-300 lbs (90-136 kg)	120 mL Iohexol 350 mgI/mL	2 mL/sec
>300 lbs (>136 kg)	129 mL Iohexol 350 mgI/mL	2 mL/sec
Begin scanning 5 minutes after end of injection (~6 minutes from start of injection)		

IV Contrast Parameters 300/370

Weight Ranges	Contrast Dosage	Injection Rate
<200 lbs. (<90 kg)	120 mL Iohexol 300 mgI/mL	2 mL/sec
200-300 lbs (90-136 kg)	140 mL Iohexol 300 mgI/mL	2 mL/sec
>300 lbs (>136 kg)	150 mL Iohexol 300 mgI/mL	2 mL/sec
Begin scanning 5 minutes after end of injection (~6 minutes from start of injection)		

Field of View

25 cm

Scan Description

- Series 1 – Scouts PA and Lateral
- Series 2 - Stereotactic Head: Scan from the hard palate to the top of the head: Be sure to include the entire nose.

Reformat Instructions

No special reformat instructions, see the reformat section for basic details.

Reformats

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
AX ST	ST	Manual	Average	80/25	3	1.5	Axial
CO ST	ST	Manual	Average	80/25	3	1.5	Coronal
SA ST	ST	Manual	Average	80/25	3	1.5	Sagittal

Networking

- All Images to PACS (ALI_Store).
- Note: if smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

Miscellaneous

If there is ANY patient motion, start the scan over.

Choose the CT scan factors on the scanner for the proper age range of the patient:

- Adult: (>= 18 years)
- Adolescent: (7 - 17 years)
- Child: (3 – 6 years)
- Infant: (0 – 2 years)

Acquisition Parameters

Series 1, Scout

	Adult
Scout 1 kV	120
Scout 1 mA	10
Scout 1 Angle	180
Scout 2 kV	120
Scout 2 mA	20
Scout 2 Angle	90
WW/WL for Scout	500/50

Series 2, Scan Phase

	Adult
Scan Type	**Helical**
Beam Collimation	**20**
Detector Rows	**32.0**
Detector Configuration	**32x0.625**
Scan FOV	**Head**
Pitch	**0.531**
Speed (mm/rot)	**10.60**
Rotation Time (s)	**0.5**
kV	**120**
AEC type	**smart mA**
mA Range	**(130-440)**
Manual mA	**210.0**
Noise Index	**6.8**
Slice Thickness (mm)	**1.25**
Interval (mm)	**0.625**

Note, image interval in the table above says 0.625 mm, it should be 1.25 mm for Recon 1 as shown below.

Series 2, Recons

	Adult
Recon 1 (Primary)	
DFOV	**25**
Recon Type	**Standard**
WW/WL	**80/25**
Recon Option	**Plus**
Recon Option	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**
Slice Thickness (mm)	**1.25**
Interval (mm)	**1.25**
Recon 2 (Secondary)	
DFOV	**25**
Recon Type	**Bone Plus**
WW/WL	**2500/350**
Recon Option	**Plus**
Recon Option	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**
Slice Thickness (mm)	**1.25**
Interval (mm)	**1.25**

Orbit - Routine 2.1

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Indication

Orbital Mass, Foreign Body, Trauma, Orbital / Periorbital cellulitis, proptosis

Oral Contrast

None

Pre-Scan Instructions

- Patient Positioning: Tilt the patients head so that a line connecting the lateral canthus of the eye and the EAC is perpendicular to the CT tabletop (see head CT protocol). You may need to put a foam pad under the occiput to get the head in this position.
- Ask the patient to look straight ahead and hold their eyes in a very still position.

IV Contrast Parameters 350

Select Ulrich Protocols 13-15

Adults

Weight Ranges	Contrast Dosage	Injection Rate
<200 lbs. (<90 kg)	103 mL Iohexol 350 mgI/mL	3 mL/sec
200-300 lbs (90-136 kg)	120 mL Iohexol 350 mgI/mL	3 mL/sec
>300 lbs (>136 kg)	129 mL Iohexol 350 mgI/mL	3 mL/sec
Delay for Adults: (Ages 18 Yrs+) 60 sec after start of injection		

IV Contrast Parameters 300/370

Adults

Weight Ranges	Contrast Dosage	Injection Rate
<200 lbs. (<90 kg)	120 mL Iohexol 300 mgI/mL	3 mL/sec
200-300 lbs (90-136 kg)	140 mL Iohexol 300 mgI/mL	3 mL/sec
>300 lbs (>136 kg)	150 mL Iohexol 300 mgI/mL	3 mL/sec
Delay for Adults: (Ages 18 Yrs+) 60 sec after start of injection		

Field of View

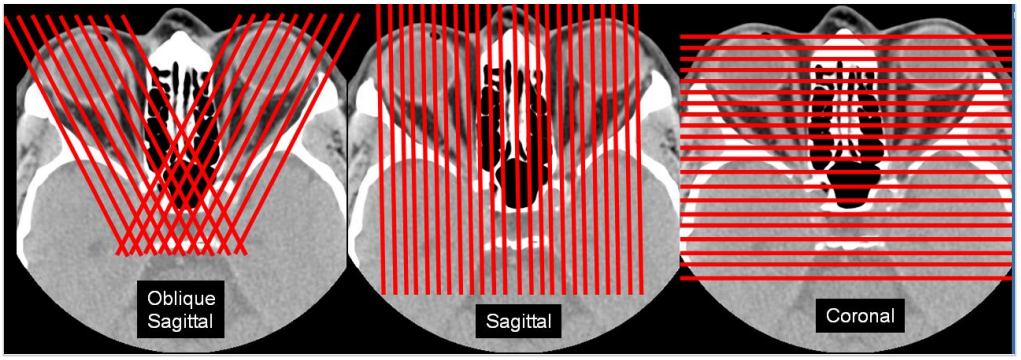
Preferred 16cm

Scan Description

- Series 1 - Scouts PA and Lateral
- Series 2 – CT Orbit Without: Start the scans at the infraorbital rim and scan through the top of the orbit.
- Series 3 - CT Orbit With: Start the scans at the infraorbital rim and scan through the top of the orbit.
    - (If Indicated by protocol for Contrast) Delay: Adults: 60 sec after start of injection. This prep delay is built into the protocol.

Reformat Instructions

- All 2-D reformats described below are to be done as 2 mm x 1 mm reformats. Do them in the coronal, sagittal, and bilateral oblique sagittal planes as shown in the image below.
- If this is an exam solely With contrast or solely Without contrast: Please perform 2D-reformats using both the ST AND the THIN BONE.
- If this is a "With & Without" contrast study: Please perform 2D reformats using ST from the With contrast series and THIN BONE from Non-Contrast series.
- Do not send the 0.625 mm bone images to PACS.



Orbit

Reformats

With or Without Contrast

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
CO ST	THIN ST	Manual	Average	300/0	2	1	Coronal
CO BONE	THIN BONE	Manual	Average	2500/350	2	1	Coronal
SA ST	THIN ST	Manual	Average	300/0	2	1	Sagittal
SA BONE	THIN BONE	Manual	Average	2500/350	2	1	Sagittal
RT OBL	THIN ST	Manual	Average	300/0	2	1	Oblique
RT OBL	THIN BONE	Manual	Average	2500/350	2	1	Oblique
LT OBL	THIN ST	Manual	Average	300/0	2	1	Oblique
LT OBL	THIN BONE	Manual	Average	2500/350	2	1	Oblique

With and Without Contrast (SOFT TISSUE reformats are made from the with contrast phase, BONE reformats are made from the without contrast phase)

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
CO ST	THIN ST (with contrast phase)	Manual	Average	300/0	2	1	Coronal
CO BONE	THIN BONE (without contrast phase)	Manual	Average	2500/350	2	1	Coronal
SA ST	THIN ST (with contrast phase)	Manual	Average	300/0	2	1	Sagittal
SA BONE	THIN BONE (without contrast phase)	Manual	Average	2500/350	2	1	Sagittal
RT OBL	THIN ST (with contrast phase)	Manual	Average	300/0	2	1	Oblique
RT OBL	THIN BONE (without contrast phase)	Manual	Average	2500/350	2	1	Oblique
LT OBL	THIN ST (with contrast phase)	Manual	Average	300/0	2	1	Oblique
LT OBL	THIN BONE (without contrast phase)	Manual	Average	2500/350	2	1	Oblique

Networking

- All Images to PACS (ALI_Store).
- Note: If smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

Miscellaneous

Choose the CT scan factors on the scanner for the proper age range of the patient:

- Adult: (>= 18 years)
- Adolescent: (7 - 17 years)
- Child: (3 – 6 years)
- Infant: (0 – 2 years)

Acquisition Parameters

Series 1, Scout

	Adult
Scout 1 kV	**120**
Scout 1 mA	**10**
Scout 1 Angle	**180**
Scout 2 kV	**120**
Scout 2 mA	**20**
Scout 2 Angle	**90**
WW/WL for Scout	**500/50**

Series 2, Scan Phase

	Adult
Scan Type	**Helical**
Beam Collimation	**20**
Detector Rows	**32.0**
Detector Configuration	**32x0.625**
Scan FOV	**Head**
Pitch	**0.531**
Speed (mm/rot)	**10.60**
Rotation Time (s)	**0.5**
kV	**120**
AEC type	**smart mA**
mA Range	**(130-440)**
Manual mA	**210.0**
Noise Index	**6.8**
Slice Thickness (mm)	**1.25**
Interval (mm)	**0.625**

Series 2, Recons

	Adult
Recon 1 (Primary)	
DFOV	**18**
Recon Type	**Standard**
WW/WL	**300/0**
Recon Option	**Plus**
Recon Option	**IQ Enhance**
ASiR/ASiR256/DLIR	**60% / 30% / High**
Slice Thickness (mm)	**1.25**
Interval (mm)	**0.625**
Recon 2 (Secondary)	
DFOV	**18**
Recon Type	**Bone Plus**
WW/WL	**2500/350**
Recon Option	**Plus**
Recon Option	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**
Slice Thickness (mm)	**1.25**
Interval (mm)	**0.625**
Recon 3 (Secondary)	
DFOV	**18**
Recon Type	**Bone Plus**
WW/WL	**2500/350**
Recon Option	**Plus**
Recon Option	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**
Slice Thickness (mm)	**0.625**
Interval (mm)	**0.312**

Series 3, Scan Phase

	Adult
Scan Type	**Helical**
Beam Collimation	**20**
Detector Rows	**32.0**
Detector Configuration	**32x0.625**
Scan FOV	**Head**
Pitch	**0.531**
Speed (mm/rot)	**10.60**
Rotation Time (s)	**0.6**
kV	**100**
AEC type	**smart mA**
mA Range	**(130-450)**
Manual mA	**230.0**
Noise Index	**8.0**
Slice Thickness (mm)	**1.25**
Interval (mm)	**0.625**

Series 3, Recons

	Adult
Recon 1 (Primary)	
DFOV	**18**
Recon Type	**Standard**
WW/WL	**300/0**
Recon Option	**Plus**
Recon Option	**IQ Enhance**
ASiR/ASiR256/DLIR	**60% / 30% / High**
Slice Thickness (mm)	**1.25**
Interval (mm)	**0.625**
Recon 2 (Secondary)	
DFOV	**18**
Recon Type	**Bone Plus**
WW/WL	**2500/350**
Recon Option	**Plus**
Recon Option	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**
Slice Thickness (mm)	**1.25**
Interval (mm)	**0.625**
Recon 3 (Secondary)	
DFOV	**18**
Recon Type	**Bone Plus**
WW/WL	**2500/350**
Recon Option	**Plus**
Recon Option	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**
Slice Thickness (mm)	**0.625**
Interval (mm)	**0.312**

16 & 32 Slice Scanner Exceptions:

1. The 0.625mm slice thickness x 0.312mm interval Recon should be 1.25mm slice thickness x 0.625mm interval on 16 and 32 slice CT scanners. The 16 and 32 slice scanners are only able to recon down to 0.625mm slice thickness when using 10mm and/or 20mm beam collimation respectively. However, when using 20mm and/or 40mm beam collimation, they are only capable of reconstructing to 1.25mm slice thickness.
2. MARS feature is not an option.
3. IQ Enhance feature requires thin slices (1.25mm or less) with an interval of half (or less). On older scanner models, in order to enable IQ Enhance at 0.625 mm slice thickness, the interval must be set to 0.311 mm instead of 0.312 mm.

DLIR Limitations:

1. DLIR is not available on the Primary Recon.
2. DLIR is only compatible with the Standard Algorithm. So, in instances where the primary recon is Soft algorithm,(i.e. many Neuro Protocols) the subsequent recons will be in Standard Algorithm to enable DLIR. The slight difference between the Soft and Standard Algorithms is outweighed by the improvement in image quality with DLIR enabled.
3. DLIR requires an interval exactly half of the slice thickness.
4. DLIR doesn't allow an interval of 0.312 mm. So, if you are on a DLIR enabled scanner, the thin 0.625 recon will be at 0.625x0.625 mm. On all other scanners the thin recon will be at 0.625x0.312 mm.

Facial Trauma - Routine 2.5

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Indication

Facial Trauma / Reconstruction, Maxillofacial surgery follow-up

Oral Contrast

None

Pre-Scan Instructions

- Remove all metallic and high-density objects from the scanning area.
- Patient Positioning: Tilt the patient's head so that a line connecting the lateral canthus and the EAC is perpendicular to the CT tabletop (see head CT protocol).

IV Contrast Parameters 350

Select Ulrich Protocols 13-15

Adults

Weight Ranges	Contrast Dosage	Injection Rate
<200 lbs. (<90 kg)	103 mL Iohexol 350 mgI/mL	3 mL/sec
200-300 lbs (90-136 kg)	120 mL Iohexol 350 mgI/mL	3 mL/sec
>300 lbs (>136 kg)	129 mL Iohexol 350 mgI/mL	3 mL/sec
Delay for Adults: (Ages 18 Yrs+) 60 sec after start of injection		

IV Contrast Parameters 300/370

Adults

Weight Ranges	Contrast Dosage	Injection Rate
<200 lbs. (<90 kg)	120 mL Iohexol 300 mgI/mL	3 mL/sec
200-300 lbs (90-136 kg)	140 mL Iohexol 300 mgI/mL	3 mL/sec
>300 lbs (>136 kg)	150 mL Iohexol 300 mgI/mL	3 mL/sec
Delay for Adults: (Ages 18 Yrs+) 60 sec after start of injection		

Field of View

Preferred 16cm

Scan Description

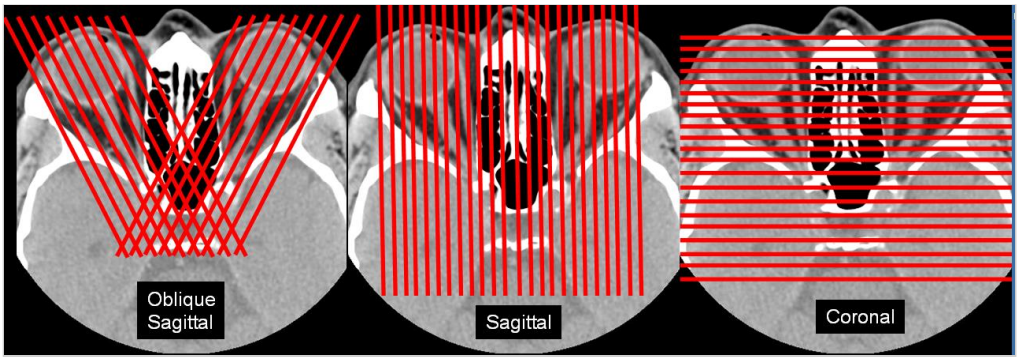
- Series 1 – Scouts PA and Lateral
- Series 2 – Facial Trauma Without Contrast: Start just below the mandible to the top of the frontal sinuses.
- Series 3 - Facial Trauma With Contrast: Start just below the mandible to the top of the frontal sinuses.
  - (If Indicated to do with contrast) Delay: 60 sec after start of injection. The prep delay is built into the protocol.

Reformat Instructions

- All 2-D reformats described below are to be done as 2 mm x 1 mm reformats as shown in the image below
  - Oblique Sagittal: Through each orbit parallel to the optic nerves.

- Sagittal: Through both orbits. Be sure to include both TMJs.
- Coronal: From the anterior aspect of the superior orbital rim through the sella. Be sure to include all of the TMJ.

- If this is an exam solely With contrast or solely Without contrast: Please perform 2D-reformats using both the ST AND the THIN BONE.
- If this is a "With & Without" contrast study: Please perform 2D reformats using ST from the With contrast series and THIN BONE from Non-Contrast series.



Orbit

Reformats

With or Without Contrast

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
CO ST	THIN ST	Manual	Average	450/50	2	1	Coronal
CO BONE	THIN BONE	Manual	Average	2500/350	2	1	Coronal
SA ST	THIN ST	Manual	Average	450/50	2	1	Sagittal
SA BONE	THIN BONE	Manual	Average	2500/350	2	1	Sagittal
RT OBL	THIN ST	Manual	Average	450/50	2	1	Oblique
RT OBL	THIN BONE	Manual	Average	2500/350	2	1	Oblique
LT OBL	THIN ST	Manual	Average	450/50	2	1	Oblique
LT OBL	THIN BONE	Manual	Average	2500/350	2	1	Oblique

With and Without Contrast (SOFT TISSUE reformats are made from the with contrast phase, BONE reformats are made from the without contrast phase)

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
CO ST	THIN ST (with contrast phase)	Manual	Average	450/50	2	1	Coronal
CO BONE	THIN BONE (without contrast phase)	Manual	Average	2500/350	2	1	Coronal
SA ST	THIN ST (with contrast phase)	Manual	Average	450/50	2	1	Sagittal
SA BONE	THIN BONE (without contrast phase)	Manual	Average	2500/350	2	1	Sagittal
RT OBL	THIN ST (with contrast phase)	Manual	Average	450/50	2	1	Oblique
RT OBL	THIN BONE (without contrast phase)	Manual	Average	2500/350	2	1	Oblique
LT OBL	THIN ST (with contrast phase)	Manual	Average	450/50	2	1	Oblique
LT OBL	THIN BONE (without contrast phase)	Manual	Average	2500/350	2	1	Oblique

Networking

- All Images to PACS (ALI_Store).
- Note: if smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

All MAR recons and reformats should be sent to PACS (ALI_Store). Label MAR reformats with the word "MAR" at the end, for example "CO ST MAR".

Miscellaneous

Choose the CT scan factors on the scanner for the proper age range of the patient:

- Adult: (>= 18 years)
- Adolescent: (7 - 17 years)
- Child: (3 – 6 years)
- Infant: (0 – 2 years)

Acquisition Parameters

Series 1, Scout

	Adult
Scout 1 kV	**120**
Scout 1 mA	**10**
Scout 1 Angle	**180**
Scout 2 kV	**120**
Scout 2 mA	**20**
Scout 2 Angle	**90**
WW/WL for Scout	**500/50**

Series 2, Scan Phase

	Adult
Scan Type	**Helical**
Beam Collimation	**20**
Detector Rows	**32.0**
Detector Configuration	**32x0.625**
Scan FOV	**Head**
Pitch	**0.531**
Speed (mm/rot)	**10.60**
Rotation Time (s)	**0.5**
kV	**120**
AEC type	**smart mA**
mA Range	**(130-440)**
Manual mA	**210.0**
Noise Index	**6.8**
Slice Thickness (mm)	**1.25**
Interval (mm)	**0.625**

Series 2, Recons

When on a Revolution 256 model scanner, we recommend switching the boneplus kernel to ULTRA.

	Adult
Recon 1 (Primary)	
DFOV	**18**
Recon Type	**Standard**
WW/WL	**450/50**
Recon Option	**Plus**
Recon Option	**IQ Enhance**
ASiR/ASiR256/DLIR	**60% / 30% / High**
Slice Thickness (mm)	**1.25**
Interval (mm)	**0.625**
Recon 2 (Secondary)	
DFOV	**18**
Recon Type	**Bone Plus**
WW/WL	**2500/350**
Recon Option	**Plus**
Recon Option	**IQ Enhance**
ASiR/ASiR256/DLIR	
Slice Thickness (mm)	**0.625**
Interval (mm)	**0.312**
Recon 3 (Secondary)	
DFOV	**18**
Recon Type	**Standard**
WW/WL	**450/50**
Recon Option	**Plus**
Recon Option	**IQ Enhance**
Recon Option	**MARS On**
ASiR/ASiR256/DLIR	**60% / 30% / High**
Slice Thickness (mm)	**1.25**
Interval (mm)	**0.625**

Series 3, Scan Phase

	Adult
Scan Type	**Helical**
Beam Collimation	**20**
Detector Rows	**32.0**
Detector Configuration	**32x0.625**
Scan FOV	**Head**
Pitch	**0.531**
Speed (mm/rot)	**10.60**
Rotation Time (s)	**0.6**
kV	**100**
AEC type	**smart mA**
mA Range	**(130-450)**
Manual mA	**230.0**
Noise Index	**8.0**
Slice Thickness (mm)	**1.25**
Interval (mm)	**0.625**

Series 2, Recons

When on a Revolution 256 model scanner, we recommend switching the boneplus kernel to ULTRA.

	Adult
Recon 1 (Primary)	
DFOV	**18**
Recon Type	**Standard**
WW/WL	**450/50**
Recon Option	**Plus**
Recon Option	**IQ Enhance**
ASiR/ASiR256/DLIR	**60% / 30% / High**
Slice Thickness (mm)	**1.25**
Interval (mm)	**0.625**
Recon 2 (Secondary)	
DFOV	**18**
Recon Type	**Bone Plus**
WW/WL	**2500/350**
Recon Option	**Plus**
Recon Option	**IQ Enhance**
Recon Option	
ASiR/ASiR256/DLIR	**0.625**
Slice Thickness (mm)	**0.312**
Interval (mm)	
Recon 3 (Secondary)	
DFOV	**18**
Recon Type	**Standard**
WW/WL	**450/50**
Recon Option	**Plus**
Recon Option	**IQ Enhance**
Recon Option	**MARS On**
ASiR/ASiR256/DLIR	**60% / 30% / High**
Slice Thickness (mm)	**1.25**
Interval (mm)	**0.625**

Pituitary Gland and Cavernous Sinus 2.6

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Indication

Pituitary Macroadenoma, Pituitary Mass, Hypogonadism, Hyperprolactinemia, Cavernous sinus mass, suprasellar mass

Oral Contrast

None

Pre-Scan Instructions

- Remove all metallic and high-density objects from the scanning area.
- Patient Positioning: Tilt the patient's head so that a line connecting the lateral canthus of the eye and the EAC is perpendicular to the CT tabletop (see below).

IV Contrast Parameters 350

Select Ulrich Protocols 13-15

Adults

Weight Ranges	Contrast Dosage	Injection Rate
<200 lbs. (<90 kg)	103 mL Iohexol 350 mgI/mL	3 mL/sec
200-300 lbs (90-136 kg)	120 mL Iohexol 350 mgI/mL	3 mL/sec
>300 lbs (>136 kg)	129 mL Iohexol 350 mgI/mL	3 mL/sec
Delay for Adults: (18 Yrs and Up) 60 sec after start of injection		

IV Contrast Parameters 300/370

Adults

Weight Ranges	Contrast Dosage	Injection Rate
<200 lbs. (<90 kg)	120 mL Iohexol 300 mgI/mL	3 mL/sec
200-300 lbs (90-136 kg)	140 mL Iohexol 300 mgI/mL	3 mL/sec
>300 lbs (>136 kg)	150 mL Iohexol 300 mgI/mL	3 mL/sec
Delay for Adults: (18 Yrs and Up) 60 sec after start of injection		

Field of View

- Head: Preferred 22 cm
- Pituitary: 14 cm

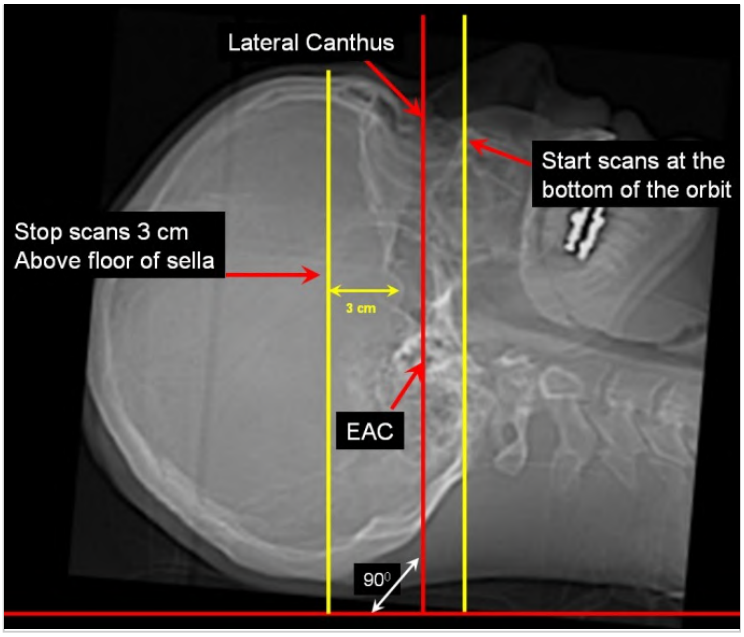
Scan Description

- Part 1: CT Head W/O Contrast
  - Series 1 - Scouts PA and Lateral
  - Series 2 - CT Head Without: Start scans at the bottom of C1 and scan through the top of the head

- Part 2: Pituitary CT with Contrast
  - Series 3
    - Delay: 60 sec after start of injection
    - Pituitary CT with Contrast (as outlined below)

- Use a DFOV of approximately 14 cm (include the orbit and sella)
- Perform helical axial scans starting at the bottom of the orbit to 3 cm above the floor of the sella.

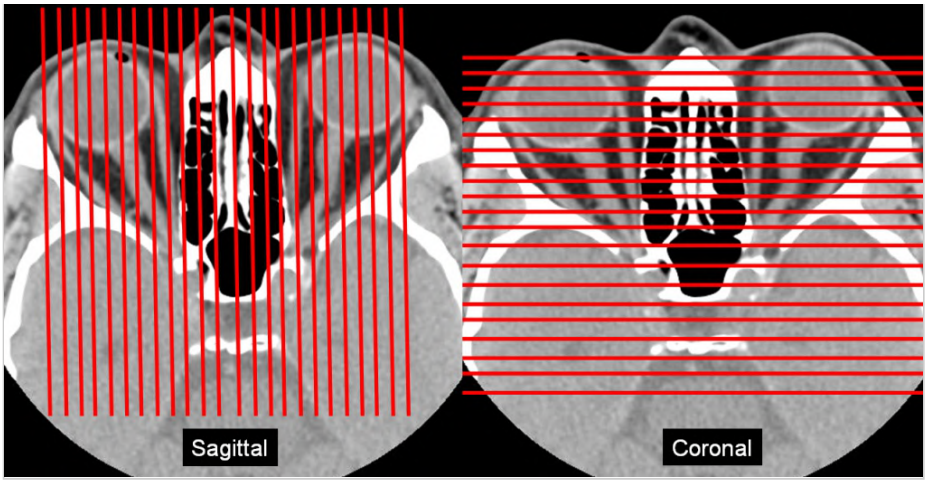
- Part 3: CT Head With Contrast
  - Series 4 – CT Head With Contrast(Start when all contrast is injected): Start scans at the bottom of C1 and scan through the top of the head



scan range for pituitary

Reformat Instructions

Do 2 mm x 1 mm 2D-reformats using both the THIN ST images AND the THIN BONE images as outlined below.



Sagittal and Coronal

Reformats

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
SA ST	THIN ST	Manual	Average	180/25	2	1	Sagittal
SA BONE	THIN BONE	Manual	Average	2500/350	2	1	Sagittal
CO ST	THIN ST	Manual	Average	180/25	2	1	Coronal
CO BONE	THIN BONE	Manual	Average	2500/350	2	1	Coronal

Networking

- Send all images to PACS (ALI_Store)
- Note: if smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

Miscellaneous

None

Acquisition Parameters

Series 1, Scout

	Adult
Scout 1 kV	120
Scout 1 mA	10
Scout 1 Angle	180
Scout 2 kV	120
Scout 2 mA	20
Scout 2 Angle	90
WW/WL for Scout	500/50

Series 2, Scan Phase

	Adult
Scan Type	Helical
Beam Collimation	20
Detector Rows	32.0
Detector Configuration	32x0.625
Scan FOV	Head
Pitch	0.531
Speed (mm/rot)	10.60
Rotation Time (s)	0.5
kV	120
AEC type	smart mA
mA Range	(130-440)
Manual mA	210.0
Noise Index	3.4
Slice Thickness (mm)	5
Interval (mm)	3.0

Series 2, Recons

	Adult
Recon 1 (Primary)	
DFOV	**22**
Recon Type	**Soft**
WW/WL	**80/25**
Recon Option	**Plus**
Recon Option	
ASiR/ASiR256/DLIR	**60% / 30% / Medium**
Slice Thickness (mm)	**5.0**
Interval (mm)	**3.0**
Recon 2 (Secondary)	
DFOV	**22**
Recon Type	**Bone Plus**
WW/WL	**2500/350**
Recon Option	**Plus**
Recon Option	
ASiR/ASiR256/DLIR	**None**
Slice Thickness (mm)	**2.5**
Interval (mm)	**1.5**
Recon 3 (Secondary)	
DFOV	**22**
Recon Type	**Soft**
WW/WL	**180/25**
Recon Option	**Plus**
Recon Option	**IQ Enhance**
ASiR/ASiR256/DLIR	**80% / 40% / High**
Slice Thickness (mm)	**1.25**
Interval (mm)	**0.625**

Series 3, Scan Phase

	Adult
Scan Type	**Helical**
Beam Collimation	**20**
Detector Rows	**32.0**
Detector Configuration	**32x0.625**
Scan FOV	**Head**
Pitch	**0.531**
Speed (mm/rot)	**10.60**
Rotation Time (s)	**0.6**
kV	**100**
AEC type	**smart mA**
mA Range	**(130-450)**
Manual mA	**230.0**
Noise Index	**8.0**
Slice Thickness (mm)	**1.25**
Interval (mm)	**0.625**

Series 3, Recons

	Adult
Recon 1 (Primary)	
DFOV	**14**
Recon Type	**Standard**
WW/WL	**450/50**
Recon Option	**Plus**
Recon Option	**IQ Enhance**
ASiR/ASiR256/DLIR	**60% / 30% / High**
Slice Thickness (mm)	**1.25**
Interval (mm)	**0.625**
Recon 2 (Secondary)	
DFOV	**14**
Recon Type	**Bone Plus**
WW/WL	**2500/350**
Recon Option	**Plus**
Recon Option	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**
Slice Thickness (mm)	**0.625**
Interval (mm)	**0.312**

Series 4, Scan Phase

	Adult
Scan Type	**Helical**
Beam Collimation	**20**
Detector Rows	**32.0**
Detector Configuration	**32x0.625**
Scan FOV	**Head**
Pitch	**0.531**
Speed (mm/rot)	**10.60**
Rotation Time (s)	**0.6**
kV	**100**
AEC type	**smart mA**
mA Range	**(130-450)**
Manual mA	**230.0**
Noise Index	**4.0**
Slice Thickness (mm)	**5**
Interval (mm)	**3.0**

Series 4, Recons

	Adult
Recon 1 (Primary)	
DFOV	**22**
Recon Type	**Soft**
WW/WL	**80/25**
Recon Option	**Plus**
Recon Option	
ASiR/ASiR256/DLIR	**60% / 30% / Medium**
Slice Thickness (mm)	**5.0**
Interval (mm)	**3.0**
Recon 2 (Secondary)	
DFOV	**22**
Recon Type	**Bone Plus**
WW/WL	**2500/350**
Recon Option	**Plus**
Recon Option	
ASiR/ASiR256/DLIR	**None**
Slice Thickness (mm)	**2.5**
Interval (mm)	**1.5**
Recon 3 (Secondary)	
DFOV	**22**
Recon Type	**Soft**
WW/WL	**180/25**
Recon Option	**Plus**
Recon Option	**IQ Enhance**
ASiR/ASiR256/DLIR	**80% / 40% / High**
Slice Thickness (mm)	**1.25**
Interval (mm)	**0.625**

Sinuses - Diagnostic 2.7

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Indication

Rhinosinusitis, Sinusitis, Nasal Discharge, Facial pain, Sinus surgery planning. If the indication is for pre-transplant workup - please be sure to include the mandible.

Video for this protocol

Oral Contrast

None

Pre-Scan Instructions

- Positioning: Tilt the patient's head so that a line connecting the lateral canthus of the eye and the EAC is perpendicular to the CT tabletop (see below). The tip of the nose and both zygomatic bones must be on the scan.
- Use Axial CT Mode with patient positioned prone if a Coronal plane scan is ordered.
- Remove all metallic and high-density objects from the scanning area.

IV Contrast Parameters 350

Select Ulrich Protocols 13-15

Adults

Weight Ranges	Contrast Dosage	Injection Rate
<200 lbs. (<90 kg)	103 mL Iohexol 350 mgI/mL	3 mL/sec
200-300 lbs (90-136 kg)	120 mL Iohexol 350 mgI/mL	3 mL/sec
>300 lbs (>136 kg)	129 mL Iohexol 350 mgI/mL	3 mL/sec
Delay for Adults: (Ages 18 Yrs+) 60 sec after start of injection		

IV Contrast Parameters 300/370

Adults

Weight Ranges	Contrast Dosage	Injection Rate
<200 lbs. (<90 kg)	120 mL Iohexol 300 mgI/mL	3 mL/sec
200-300 lbs (90-136 kg)	140 mL Iohexol 300 mgI/mL	3 mL/sec
>300 lbs (>136 kg)	150 mL Iohexol 300 mgI/mL	3 mL/sec
Delay for Adults: (Ages 18 Yrs+) 60 sec after start of injection		

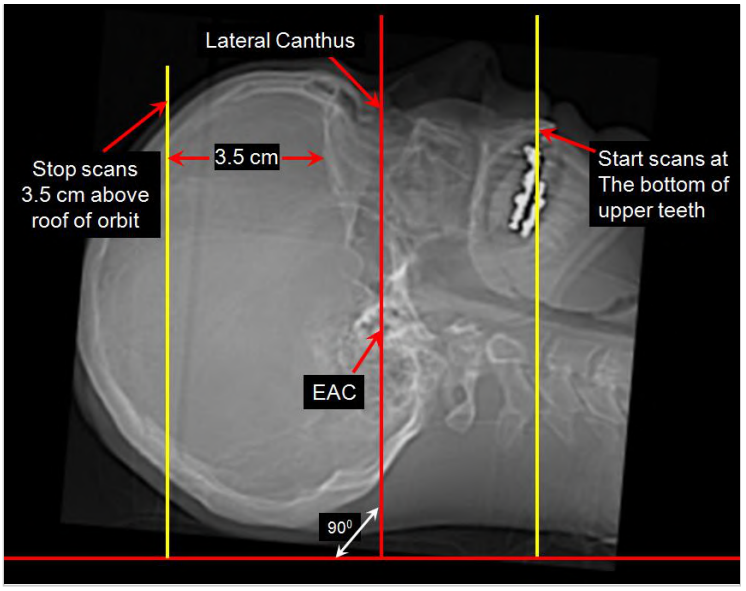
Field of View

Preferred 14 cm

Scan Description

- Series 1 – Scouts PA and Lateral
- Series 2 – CT Sinus Without Contrast:
  - Scan from bottom of upper teeth to 3.5 cm above the orbital roof (see below). Be sure to include the entire nose and ears for pre-op requests.

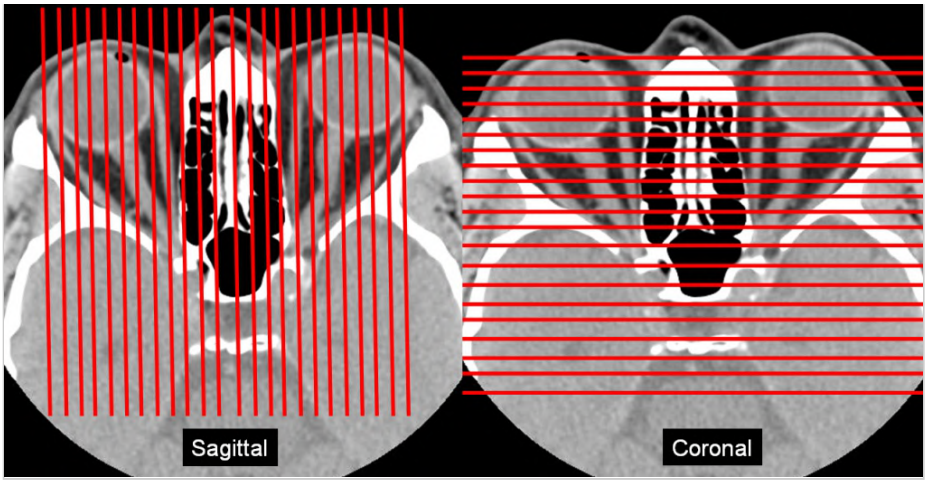
- Series 3 – (If Indicated to do with contrast) Delay: 60 sec after start of injection
- Series 3 – CT Sinus With Contrast:
    - Scan from bottom of upper teeth to 3.5 cm above the orbital roof (see below)



scan range for sinus

Reformat Instructions

- All 2-D reformats described below are to be done as 2 mm x 1 mm reformats (see below)
    - Sagittal: Through both orbits. Be sure to include both TMJs.
    - Coronal: From the anterior aspect of the superior orbital rim through the sella. Be sure to include all of the TMJ.
- If this is an exam solely With contrast or solely Without contrast: Please perform 2D-reformats using both the ST AND the THIN BONE.
- If this is a "With & Without" contrast study: Please perform 2D reformats using ST from the With contrast series and THIN BONE from Non-Contrast series.



Sagittal and Coronal

Reformats

With or Without Contrast

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
CO ST	THIN ST	Manual	Average	400/30	2	1	Coronal
CO BONE	THIN BONE	Manual	Average	2500/350	2	1	Coronal
SA ST	THIN ST	Manual	Average	400/30	2	1	Sagittal
SA BONE	THIN BONE	Manual	Average	2500/350	2	1	Sagittal

With and Without Contrast (SOFT TISSUE reformats are made from the with contrast phase, BONE reformats are made from the without contrast phase)

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
CO ST	THIN ST (with contrast phase)	Manual	Average	400/30	2	1	Coronal
CO BONE	THIN BONE (without contrast phase)	Manual	Average	2500/350	2	1	Coronal
SA ST	THIN ST (with contrast phase)	Manual	Average	400/30	2	1	Sagittal
SA BONE	THIN BONE (without contrast phase)	Manual	Average	2500/350	2	1	Sagittal

Networking

- All Images to PACS (ALI_Store).
- Note: if smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

Miscellaneous

Choose the CT scan factors on the scanner for the proper age range of the patient:

- Adult: (>= 18 years)
- Adolescent: (7 - 17 years)
- Child: (3 – 6 years)
- Infant: (0 – 2 years)

Acquisition Parameters

Series 1, Scout

	Adult
Scout 1 kV	120
Scout 1 mA	10
Scout 1 Angle	180
Scout 2 kV	120
Scout 2 mA	20
Scout 2 Angle	90
WW/WL for Scout	500/50

Series 2, Scan Phase

	Adult
Scan Type	**Helical**
Beam Collimation	**20**
Detector Rows	**32.0**
Detector Configuration	**32x0.625**
Scan FOV	**Head**
Pitch	**0.531**
Speed (mm/rot)	**10.60**
Rotation Time (s)	**0.5**
kV	**120**
AEC type	**smart mA**
mA Range	**(30-110)**
Manual mA	**50.0**
Noise Index	**13.6**
Slice Thickness (mm)	**1.25**
Interval (mm)	**0.625**

Series 2, Recons

	Adult
Recon 1 (Primary)	
DFOV	**14**
Recon Type	**Standard**
WW/WL	**400/30**
Recon Option	**Plus**
Recon Option	**IQ Enhance**
ASiR/ASiR256/DLIR	**80% / 40% / High**
Slice Thickness (mm)	**1.25**
Interval (mm)	**0.625**
Recon 2 (Secondary)	
DFOV	**14**
Recon Type	**Bone Plus**
WW/WL	**2500/350**
Recon Option	**Plus**
Recon Option	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**
Slice Thickness (mm)	**0.625**
Interval (mm)	**0.312**
Recon 3 (Secondary)	
DFOV	**14**
Recon Type	**Standard**
WW/WL	**400/30**
Recon Option	**Plus**
Recon Option	**IQ Enhance**
Recon Option	**MARS On**
ASiR/ASiR256/DLIR	**80% / 40% / High**
Slice Thickness (mm)	**1.25**
Interval (mm)	**0.625**

16 & 32 Slice Scanner Exceptions:

1. The 0.625mm slice thickness x 0.312mm interval Recon should be 1.25mm slice thickness x 0.625mm interval on 16 and 32 slice CT scanners. The 16 and 32 slice scanners are only able to recon down to 0.625mm slice thickness when using 10mm and/or 20mm beam collimation respectively. However, when using 20mm and/or 40mm beam collimation, they are only capable of reconstructing to 1.25mm slice thickness.
2. MARS feature is not an option.
3. IQ Enhance feature requires thin slices (1.25mm or less) with an interval of half (or less). On older scanner models, in order to enable IQ Enhance at 0.625 mm slice thickness, the interval must be set to 0.311 mm instead of 0.312 mm.

Series 3, Scan Phase

	Adult
Scan Type	**Helical**
Beam Collimation	**20**
Detector Rows	**32.0**
Detector Configuration	**32x0.625**
Scan FOV	**Head**
Pitch	**0.531**
Speed (mm/rot)	**10.60**
Rotation Time (s)	**0.5**
kV	**100**
AEC type	**smart mA**
mA Range	**(40-140)**
Manual mA	**70.0**
Noise Index	**16.0**
Slice Thickness (mm)	**1.25**
Interval (mm)	**0.625**

Series 3, Recons

	Adult
Recon 1 (Primary)	
DFOV	**14**
Recon Type	**Standard**
WW/WL	**400/30**
Recon Option	**Plus**
Recon Option	**IQ Enhance**
ASiR/ASiR256/DLIR	**80% / 40% / High**
Slice Thickness (mm)	**1.25**
Interval (mm)	**0.625**
Recon 2 (Secondary)	
DFOV	**14**
Recon Type	**Bone Plus**
WW/WL	**2500/350**
Recon Option	**Plus**
Recon Option	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**
Slice Thickness (mm)	**0.625**
Interval (mm)	**0.312**
Recon 3 (Secondary)	
DFOV	**14**
Recon Type	**Standard**
WW/WL	**400/30**
Recon Option	**Plus**
Recon Option	**IQ Enhance**
Recon Option	**MARS On**
ASiR/ASiR256/DLIR	**80% / 40% / High**
Slice Thickness (mm)	**1.25**
Interval (mm)	**0.625**

16 & 32 Slice Scanner Exceptions:

1. The 0.625mm slice thickness x 0.312mm interval Recon should be 1.25mm slice thickness x 0.625mm interval on 16 and 32 slice CT scanners. The 16 and 32 slice scanners are only able to recon down to 0.625mm slice thickness when using 10mm and/or 20mm beam collimation respectively. However, when using 20mm and/or 40mm beam collimation, they are only capable of reconstructing to 1.25mm slice thickness.
2. MARS feature is not an option.
3. IQ Enhance feature requires thin slices (1.25mm or less) with an interval of half (or less). On older scanner models, in order to enable IQ Enhance at 0.625 mm slice thickness, the interval must be set to 0.311 mm instead

of 0.312 mm.

Temporal Bone 2.11

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Indication

Otitis / mastoiditis with concern for abscess, intracranial spread, venous thrombosis

Video for this protocol

Oral Contrast

None

Pre-Scan Instructions

- Patient Positioning: Tilt the patient's head so that a line connecting the lateral canthus of the eye and the EAC is perpendicular to the CT tabletop (see below).
- Remove all metallic and high-density objects from the scanning area.

IV Contrast Parameters 350

Select Ulrich Protocols 13-15

Adults

Weight Ranges	Contrast Dosage	Injection Rate
<200 lbs. (<90 kg)	103 mL Iohexol 350 mgI/mL	3 mL/sec
200-300 lbs (90-136 kg)	120 mL Iohexol 350 mgI/mL	3 mL/sec
>300 lbs (>136 kg)	129 mL Iohexol 350 mgI/mL	3 mL/sec
Delay for Adults: (Ages 18 Yrs+) 60 sec after start of injection		

IV Contrast Parameters 300/370

Adults

Weight Ranges	Contrast Dosage	Injection Rate
<200 lbs. (<90 kg)	120 mL Iohexol 300 mgI/mL	3 mL/sec
200-300 lbs (90-136 kg)	140 mL Iohexol 300 mgI/mL	3 mL/sec
>300 lbs (>136 kg)	150 mL Iohexol 300 mgI/mL	3 mL/sec
Delay for Adults: (Ages 18 Yrs+) 60 sec after start of injection		

Field of View

1. Recon 1 and 4: Preferred 22 cm
2. Recon 2 and 3: Preferred 9.6 cm - Individual T-bones (right and left).

Scan Description

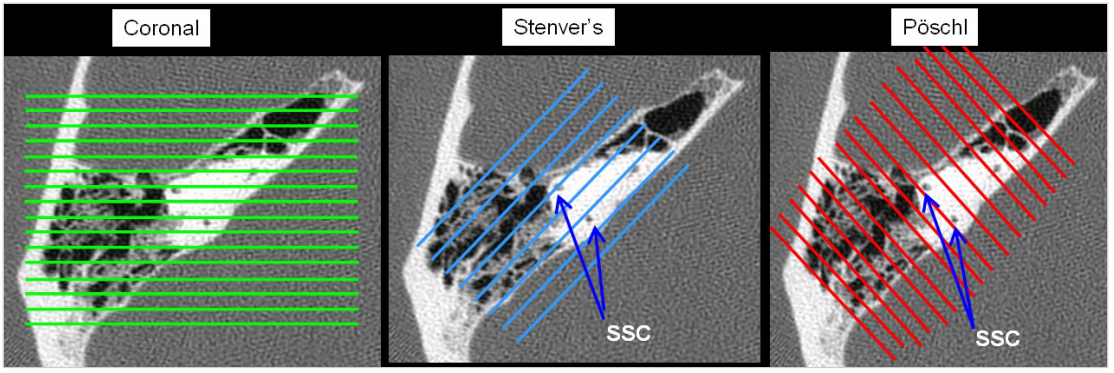
- Series 1 – Scout PA and Lateral
- Series 2 - Helical Scan - Select ONE of the 3 following options:
  - 1) T-bone WITHOUT
    - Coverage: Start scans at the mastoid tip and end at the top of the petrous bone (see image below).

- 2) T-bone WITH
  - Coverage: Start scans at the mastoid tip and end at the top of the petrous bone (see image below).
  - Timing: Begin scanning 60 seconds after the start of contrast.
- 3) T-Bone W/O and WITH
  - Coverage: Start scans at the mastoid tip and end at the top of the petrous bone (see image below).
  - Use "Repeat Series" to scan the WITH contrast phase, same coverage as WITHOUT series.
  - Timing: Begin scanning 60 seconds after the start of contrast.

scan range for tbone

Reformat Instructions

- Do 1 mm by 0.5 mm 2D-reformats in the coronal, Stenver's, and Pöschl planes of each temporal bone using THIN BONE.



Sagittal and Coronal

Reformats

If ordered as without and with, do these reformats for each phase (12 total)

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
RT CO	THIN BONE	Manual	Average	2500/350	1	0.5	Coronal
RT STENV	THIN BONE	Manual	Average	2500/350	1	0.5	Oblique
RT POSCH	THIN BONE	Manual	Average	2500/350	1	0.5	Oblique
LT CO	THIN BONE	Manual	Average	2500/350	1	0.5	Coronal
LT STENV	THIN BONE	Manual	Average	2500/350	1	0.5	Oblique
LT POSCH	THIN BONE	Manual	Average	2500/350	1	0.5	Oblique

Networking

- All Images to PACS (ALI_Store).

- Note: if smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

Miscellaneous

Choose the CT scan factors on the scanner for the proper age range of the patient:

- Adult: (>= 18 years)
- Adolescent: (7 - 17 years)
- Child: (3 – 6 years)
- Infant: (0 – 2 years)

Acquisition Parameters

Series 1, Scout

	Adult
Scout 1 kV	**120**
Scout 1 mA	**10**
Scout 1 Angle	**180**
Scout 2 kV	**120**
Scout 2 mA	**20**
Scout 2 Angle	**90**
WW/WL for Scout	**500/50**

Series 2, Scan Phase

	Adult
Scan Type	**Helical**
Beam Collimation	**20**
Detector Rows	**32.0**
Detector Configuration	**32x0.625**
Scan FOV	**Head**
Pitch	**0.531**
Speed (mm/rot)	**10.60**
Rotation Time (s)	**0.5**
kV	**120**
AEC type	**smart mA**
mA Range	**(130-440)**
Manual mA	**210.0**
Noise Index	**4.8**
Slice Thickness (mm)	**2.5**
Interval (mm)	**1.5**

Series 2, Recons

When on a Revolution 256 model scanner, we recommend switching the boneplus kernel to ULTRA for the 22 cm RFOV.

	Adult
Recon 1 (Primary)	
DFOV	**22**
Recon Type	**Bone Plus**
WW/WL	**2500/350**
Recon Option	**Plus**
Recon Option	
ASiR/ASiR256/DLIR	**None**
Slice Thickness (mm)	**2.5**
Interval (mm)	**1.5**
Recon 2 (Secondary)	
DFOV	**9.6**
Recon Type	**Bone Plus**
WW/WL	**2500/350**
Recon Option	**Plus**
Recon Option	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**
Slice Thickness (mm)	**0.625**
Interval (mm)	**0.312**
Recon 3 (Secondary)	
DFOV	**9.6**
Recon Type	**Bone Plus**
WW/WL	**2500/350**
Recon Option	**Plus**
Recon Option	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**
Slice Thickness (mm)	**0.625**
Interval (mm)	**0.312**
Recon 4 (Secondary)	
DFOV	**22**
Recon Type	**Standard**
WW/WL	**450/50**
Recon Option	**Plus**
Recon Option	**IQ Enhance**
ASiR/ASiR256/DLIR	**60% / 30% / High**
Slice Thickness (mm)	**2.5**
Interval (mm)	**1.5**

DentaScan 2.13

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Indication

Low Dose scan of Maxilla and Mandible. This exam is meant to replace a diagnostic Panorex X-ray. Indications include: 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.

Oral Contrast

None

Pre-Scan Instructions

- Positioning: Tilt the patient's head so that a line connecting the lateral canthus of the eye and the EAC is perpendicular to the CT tabletop (see below). The tip of the nose and both zygomatic bones must be on the scan.
- Remove all metallic and high-density objects from the scanning area.

IV Contrast Parameters

None

Field of View

Preferred 18cm FOV to include TMJs

Scan Description

- Series 1 – Scouts PA and Lateral
- Series 2 – CT DentaScan Without Contrast: Limited Coverage.
    - Start scan at the mandible and scan to the bottom of orbital floor. Be sure to include entire jaw, and both TMJs.

Reformat Instructions

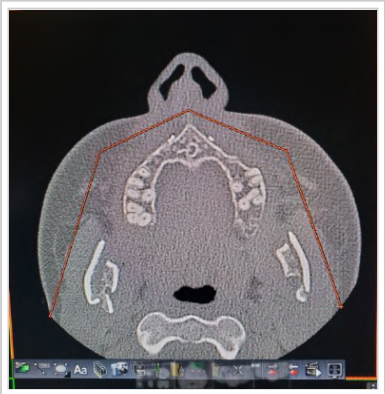
All 2-D reformats described below are to be done as 2 mm x 1 mm reformats (see below)

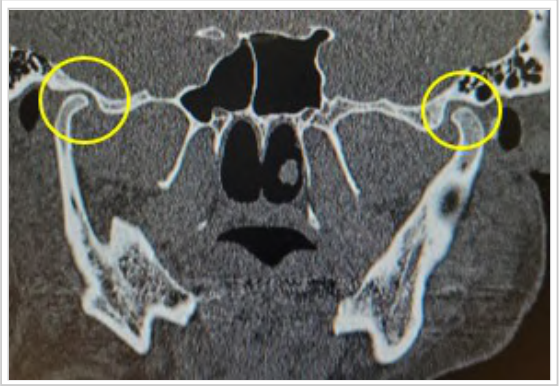
- **Sagittal**: Be sure to include both TMJs.
- **Coronal**: From the anterior aspect of the mandible through the TMJs
- **Curved**: DentaScan Curved Reformat Instructions
- Load the Thin Bone series in reformat
- Change the top left port to curved. NOTE: The port will go black and say UNDEFINED CURVE.
- Under Display Tab, click on the rotate/translate button (See images above)
- Choose translate tab and change to 1 mm
- In the Axial port, scroll back and forth through the image. Find an image where you can see the entire jawline, most importantly both TMJs
- IF necessary, use the multi-oblique tool to properly align the jaw.
- Hold the shift key and use the left mouse button, to click points along the contour of the skin-line. (see reference image #1) Be sure to start/end beyond the TMJ's. Use as many points as you want. You may also hold the alt key, then the small green boxes become active and they can be moved to better fit along the skinline.

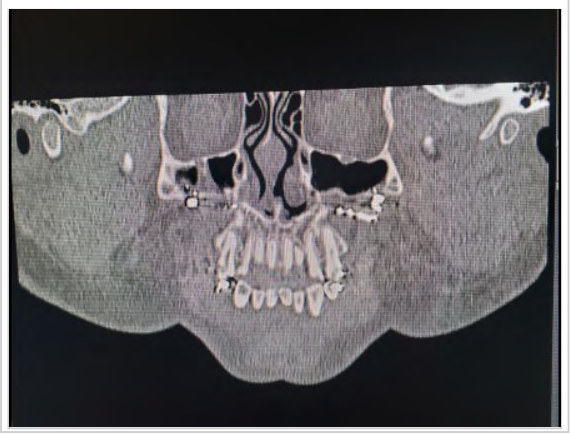
Scroll up and down in the axial port to ensure all the anatomy of the jaw will be included. (see reference images #3 and #4)

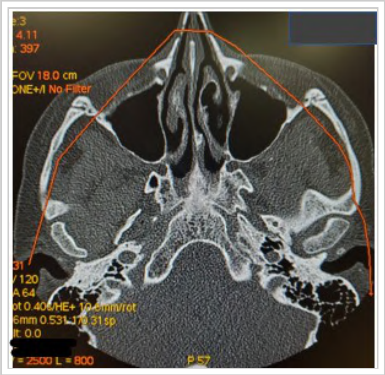
  - If you are clipping, or the image is coming out crooked, feel free to adjust your drop points anywhere in-between the skin-line and bony jawline. Keep in mind, the sharper the curve, the more distortion will be present in your reformat.
- Change window width/level to 2500/800 (I feel like this looks better/a little darker?)
- Click back in the curved box to make it active. Next click on batch, choose loop. Scroll to find the first image and click on set start, then scroll to find the last image and click on set end. Change the spacing to 1 mm. You can preview it if you wish. (see reference image #2)
- Series Description should be labeled: "Curved Reformat"
- Send reformat to PACS

Reference Images









Reformats

With or Without Contrast

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
CO ST	THIN ST	Manual	Average	450/50	2	1	Coronal
CO BONE	THIN BONE	Manual	Average	2500/350	2	1	Coronal
SA ST	THIN ST	Manual	Average	450/50	2	1	Sagittal
SA BONE	THIN BONE	Manual	Average	2500/350	2	1	Sagittal

Networking

- All Images to PACS (ALI_Store).
- Note: if smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

Acquisition Parameters

Series 1, Scout

	Adult
Scout 1 kV	120
Scout 1 mA	10
Scout 1 Angle	180
Scout 2 kV	120
Scout 2 mA	20
Scout 2 Angle	90
WW/WL for Scout	500/50

Series 2, Scan Phase

	Adult
Scan Type	Helical
Beam Collimation	20
Detector Rows	32.0
Detector Configuration	32x0.625
Scan FOV	Head
Pitch	0.531
Speed (mm/rot)	10.60
Rotation Time (s)	0.5
kV	120
AEC type	smart mA
mA Range	(30-110)
Manual mA	50.0
Noise Index	13.6
Slice Thickness (mm)	1.25
Interval (mm)	0.625

Series 2, Recons

	Adult
Recon 1 (Primary)	
DFOV	**18**
Recon Type	**Standard**
WW/WL	**450/50**
Recon Option	**Plus**
Recon Option	**IQ Enhance**
ASiR/ASiR256/DLIR	**80% / 40% / High**
Slice Thickness (mm)	**1.25**
Interval (mm)	**0.625**
Recon 2 (Secondary)	
DFOV	**18**
Recon Type	**Bone Plus**
WW/WL	**2500/350**
Recon Option	**Plus**
Recon Option	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**
Slice Thickness (mm)	**0.625**
Interval (mm)	**0.312**
Recon 3 (Secondary)	
DFOV	**18**
Recon Type	**Standard**
WW/WL	**450/50**
Recon Option	**Plus**
Recon Option	**IQ Enhance**
Recon Option	**MARS On**
ASiR/ASiR256/DLIR	**80% / 40% / High**
Slice Thickness (mm)	**1.25**
Interval (mm)	**0.625**

16 & 32 Slice Scanner Exceptions:

1. The 0.625mm slice thickness x 0.312mm interval Recon should be 1.25mm slice thickness x 0.625mm interval on 16 and 32 slice CT scanners. The 16 and 32 slice scanners are only able to recon down to 0.625mm slice thickness when using 10mm and/or 20mm beam collimation respectively. However, when using 20mm and/or 40mm beam collimation, they are only capable of reconstructing to 1.25mm slice thickness.
2. MARS feature is not an option.
3. IQ Enhance feature requires thin slices (1.25mm or less) with an interval of half (or less). On older scanner models, in order to enable IQ Enhance at 0.625 mm slice thickness, the interval must be set to 0.311 mm instead of 0.312 mm.

Adult Neck - Routine 3.1/3.2/3.3

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Indication

- Neck mass, globus sensation, lymphadenopathy, head and neck cancer evaluation/follow-up, pharyngitis, tonsillar or peritonsillar abscess, neck abscess.
- If the indication is for neck mass, especially for first time scans, please have patient place a BB on the palpable mass.
- GSI limited neck series will be requested by the Radiologist. This will be requested on patients to diagnosis head or neck cancer. See specific coverage options below.

Video for this protocol

Oral Contrast

None

Pre-Scan Instructions

- Patient supine, PA and lateral scouts from sella to mid chest (include the aortic arch), no gantry angle
- Have the patient remove any dentures or removable teeth, please place the shoulders as low possible
- Positioning: Tilt the patient's head so that a line connecting the lateral canthus of the eye and the EAC is perpendicular to the CT tabletop (see head CT protocol).
- Remove all metallic and high-density objects from the scanning area.
- If the indication is for neck mass, especially for first time scans, please have patient place a BB on the palpable mass.
- Right sided IV is always preferred (not required) for imaging of the neck due to contrast reflux into the brachiocephalic veins.
- Perform angled views if there are artifacts from dental fillings or metal hardware. Check with Radiologist before performing angled views on Pediatric patients, we rarely do these (see below)

IV Contrast Parameters 350

Select Ulrich Protocols 16-18

ADULTS

Weight Ranges	Contrast Dosage	Injection Rate
<200 lbs. (<90 kg)	51 mL Iohexol 350 mgI/mL PAUSE 60 SECONDS AND THEN 34 mL Iohexol 350 mgI/mL + 50 mL NaCl flush	Contrast: 2 mL/sec NaCl flush: 3 mL/sec
200-300 lbs (90-136 kg)	64 mL Iohexol 350 mgI/mL PAUSE 60 SECONDS AND THEN 43 mL Iohexol 350 mgI/mL + 50 mL NaCl flush	Contrast: 2.5 mL/sec NaCl flush: 3 mL/sec
>300 lbs (>136 kg)	73 mL Iohexol 350 mgI/mL PAUSE 60 SECONDS AND THEN 47 mL Iohexol 350 mgI/mL + 50 mL NaCl flush	Contrast: 3 mL/sec NaCl flush: 3 mL/sec
Delay for Adults: (18 Yrs and Up) 115 sec after start of injection		

IV Contrast Parameters 300/370

ADULTS

Weight Ranges	Contrast Dosage	Injection Rate
<200 lbs. (<90 kg)	60 mL Iohexol 300 mgI/mL PAUSE 60 SECONDS AND THEN 40 mL Iohexol 300 mgI/mL + 50 mL NaCl flush	Contrast: 2 mL/sec NaCl flush: 3 mL/sec
200-300 lbs (90-136 kg)	75 mL Iohexol 300 mgI/mL PAUSE 60 SECONDS AND THEN 50 mL Iohexol 300 mgI/mL + 50 mL NaCl flush	Contrast: 2.5 mL/sec NaCl flush: 3 mL/sec
>300 lbs (>136 kg)	85 mL Iohexol 300 mgI/mL PAUSE 60 SECONDS AND THEN 55 mL Iohexol 300 mgI/mL + 50 mL NaCl flush	Contrast: 3 mL/sec NaCl flush: 3 mL/sec
Delay for Adults: (18 Yrs and Up) 115 sec after start of injection		

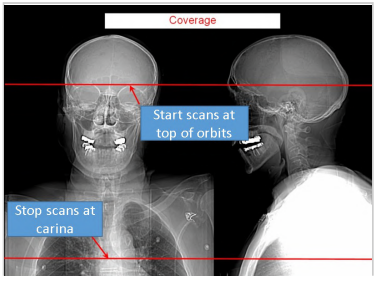
Field of View

Preferred 30 cm

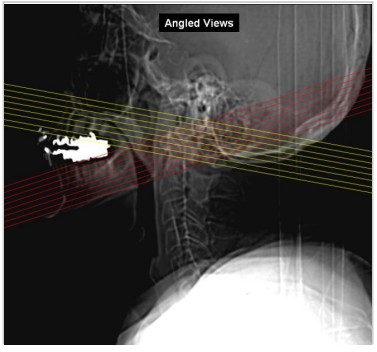
(22cm for the Angled Axials/ Extension Series)

Scan Description

- **Series 1** – Scouts PA and Lateral
- **Series 2** – Neck with Contrast: Start the scan at the top of the orbits and scan to the carina. Remind the patient not to swallow during the scan.
  - Timing: 115 seconds after the start of injection. The prep delay is built into the protocol. **NOTE**: If scanning a NECK C/A/P please reduce Prep Delay to 45 seconds due to smaller contrast bolus.
- **Series 3** - Optional GSI Limited Series- See coverage below.
  - Timing: Immediately to follow routine neck series
- **Series 4** - Angled Axials- If there is a significant amount of metal artifact from dental work, perform angled axials at 2 different angels. (see below picture)

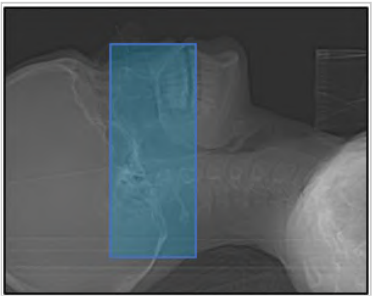


scan range for neck

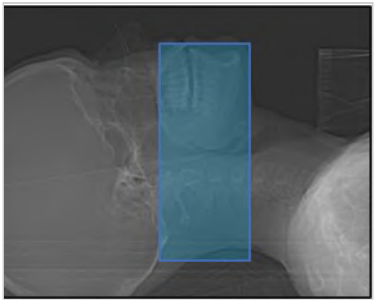


Angled Views

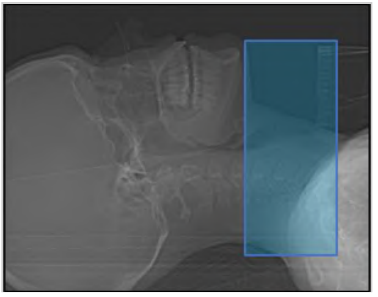
- **Optional GSI Series Coverage**



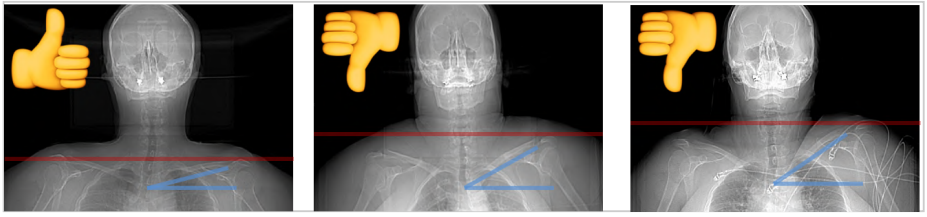
Nasopharynx: Cover from the skull base to between the teeth.



Oropharynx: Cover from the hard palate to the hyoid bone.



Larynx: Cover from the hyoid bone to the inferior endplate of C7.



Examples of good and bad shoulder position relative to the neck. The techniques listed above can get a patient from having a poor positioning of the shoulder to a good position. Note: try to recognize improper shoulder relaxation before you scout. If, however, you only notice this after you scout, there is no need to re-scout the patient after they move their shoulders.

NOTE - if the patient has lymphoma and the study is a follow-up, use the small neck protocol (regardless of the patients actual size) since it will provide a lower dose

- Verify that the arms are outside of the CT wrap, and that the shoulders are relaxed down toward the feet as far as possible. Measure the width of the shoulders through the level of the mid-humeral head, as shown below.
- Check BMI
- Select small, medium and large based on the table below.

Measure width through mid-humeral heads	Small	Medium	Large
	Shoulder width less than 46 cm *OR* BMI less than 26	**Shoulder Width 46 to 50 cm**	**Shoulder width greater than 50 cm *OR* BMI greater than 35**

Reformat Instructions

- Reformats should cover from the tip of the nose through the back of the neck.
- Only send STD AND BONE to PACS. Use THIN ST for the soft tissue Reformats. Use THIN BONE for the bone Reformats.**For the soft tissue: Perform 2D reformats from Recon 3 in both the coronal and sagittal planes, using a 3 mm thickness and 1.5 mm increment.
- For bone: Perform 2D reformats from THIN BONE for both the coronal and sagittal planes, using a 1.5 mm thickness and 0.75 mm increment.

Reformats

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
CO ST	Thin ST	Manual	Average	300/35	3	1.5	Coronal
CO BONE	Thin Bone	Manual	Average	2500/350	1.5	0.75	Coronal
SA ST	Thin ST	Manual	Average	300/35	3	1.5	Sagittal
SA BONE	Thin Bone	Manual	Average	2500/350	1.5	0.75	Sagittal

Networking

- All Images to PACS (ALI_Store). Do not send Thin Bone or Thin STD (non-MAR) these recons are made solely to build reformats from.
- Send both standard and bone plus series for the angled axial images to PACS (ALI_Store).
- Note: if smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

All MAR recons and reformats should be sent to PACS (ALI_Store). Label MAR reformats with the word "MAR" at the end, for example "CO ST MAR".

Miscellaneous

None

Acquisition Parameters

Series 1, Scout

	Small	Medium	Large
Scout 1 kV	120	140	140
Scout 1 mA	10	10	10
Scout 1 Angle	180	180	180
Scout 2 kV	120	140	140
Scout 2 mA	80	80	80
Scout 2 Angle	90	90	90
WW/WL for Scout	500/50	500/50	500/50

Series 2, Scan Phase

	Small	Medium	Large
Scan Type	Helical	Helical	Helical
Beam Collimation	20	20	20
Detector Rows	32.0	32.0	32.0
Detector Configuration	32x0.625	32x0.625	32x0.625
Scan FOV	Large Body	Large Body	Large Body
Pitch	0.531	0.531	0.531
Speed (mm/rot)	10.60	10.60	10.60
Rotation Time (s)	0.8	1	1
kV	100	120	140
AEC type	smart mA	smart mA	smart mA
mA Range	(140-440)	(130-530)	(130-515)
Manual mA	340.0	330.0	330.0
Noise Index	12.9	14.7	18.8
Slice Thickness (mm)	2.5	2.5	2.5
Interval (mm)	1.5	1.5	1.5

Series 2, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**30**	**30**	**30**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**300/35**	**300/35**	**300/35**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option			
ASiR/ASiR256/DLIR	**60% / 30% / Medium**	**60% / 30% / Medium**	**60% / 30% / Medium**
Slice Thickness (mm)	**2.5**	**2.5**	**2.5**
Interval (mm)	**1.5**	**1.5**	**1.5**
Recon 2 (Secondary)			
DFOV	**30**	**30**	**30**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**2500/350**	**2500/350**	**2500/350**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**	**None**	**None**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**
Recon 3 (Secondary)			
DFOV	**30**	**30**	**30**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**300/35**	**300/35**	**300/35**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
Recon Option	**MARS On**	**MARS On**	**MARS On**
ASiR/ASiR256/DLIR	**80% / 40% / High**	**80% / 40% / High**	**80% / 40% / High**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**
Recon 4 (Secondary)			
DFOV	**30**	**30**	**30**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**2500/350**	**2500/350**	**2500/350**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**	**None**	**None**
Slice Thickness (mm)	**0.625**	**0.625**	**0.625**
Interval (mm)	**0.312**	**0.312**	**0.312**

16 & 32 Slice Scanner Exceptions:

1. The 0.625mm slice thickness x 0.312mm interval Recon should be 1.25mm slice thickness x 0.625mm interval on 16 and 32 slice CT scanners. The 16 and 32 slice scanners are only able to recon down to 0.625mm slice thickness when using 10mm and/or 20mm beam collimation respectively. However, when using 20mm and/or 40mm beam collimation, they are only capable of reconstructing to 1.25mm slice thickness.
2. MARS feature is not an option.
3. IQ Enhance feature requires thin slices (1.25mm or less) with an interval of half (or less). On older scanner models, in order to enable IQ Enhance at 0.625 mm slice thickness, the interval must be set to 0.311 mm instead of 0.312 mm.

Series 3, Optional GSI Limited Series

Revolution 256:

All sizes - GSI Profile UW Soft Tissue Neck

Non Revolution 256:

Small Adult - GSI Profile 34

Medium Adult - GSI Profile 18

Large Adult - GSI Profile 2

Series 4, Group 1, Scan Phase

	Small	Medium	Large
Scan Type	**Axial**	**Axial**	**Axial**
Beam Collimation	**20**	**20**	**20**
Detector Rows	**32.0**	**32.0**	**32.0**
Detector Configuration	**32x0.625**	**32x0.625**	**32x0.625**
Scan FOV	**Large Body**	**Large Body**	**Large Body**
Pitch	**1**	**1**	**1**
Speed (mm/rot)	**20.00**	**20.00**	**20.00**
Rotation Time (s)	**0.9**	**0.9**	**0.9**
kV	**120**	**120**	**120**
AEC type	**Manual mA**	**Manual mA**	**Manual mA**
mA Range	**(130-550)**	**(130-550)**	**(130-550)**
Manual mA	**330.0**	**330.0**	**330.0**
Noise Index	**4.8**	**4.8**	**4.8**
Slice Thickness (mm)	**2.5**	**2.5**	**2.5**
Interval (mm)	**20**	**20**	**20**

Series 4, Group 1, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**22**	**22**	**22**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**300/35**	**300/35**	**300/35**
Recon Option	**Full**	**Full**	**Full**
Recon Option			
ASiR/ASiR256/DLIR	**60% / 30% / High**	**60% / 30% / High**	**60% / 30% / High**
Slice Thickness (mm)	**2.5**	**2.5**	**2.5**
Interval (mm)	**N/A**	**N/A**	**N/A**
Recon 2 (Secondary)			
DFOV	**22**	**22**	**22**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**2500/350**	**2500/350**	**2500/350**
Recon Option	**Full**	**Full**	**Full**
Recon Option			
ASiR/ASiR256/DLIR	**None**	**None**	**None**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**N/A**	**N/A**	**N/A**

Series 4, Group 2, Scan Phase

	Small	Medium	Large
Scan Type	**Axial**	**Axial**	**Axial**
Beam Collimation	**20**	**20**	**20**
Detector Rows	**32.0**	**32.0**	**32.0**
Detector Configuration	**32x0.625**	**32x0.625**	**32x0.625**
Scan FOV	**Large Body**	**Large Body**	**Large Body**
Pitch	**1**	**1**	**1**
Speed (mm/rot)	**20.00**	**20.00**	**20.00**
Rotation Time (s)	**0.9**	**0.9**	**0.9**
kV	**120**	**120**	**120**
AEC type	**Manual mA**	**Manual mA**	**Manual mA**
mA Range	**(130-550)**	**(130-550)**	**(130-550)**
Manual mA	**330.0**	**330.0**	**330.0**
Noise Index	**4.8**	**4.8**	**4.8**
Slice Thickness (mm)	**2.5**	**2.5**	**2.5**
Interval (mm)	**20**	**20**	**20**

Series 4, Group 2, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**22**	**22**	**22**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**300/35**	**300/35**	**300/35**
Recon Option	**Full**	**Full**	**Full**
Recon Option			
ASiR/ASiR256/DLIR	**60% / 30% / High**	**60% / 30% / High**	**60% / 30% / High**
Slice Thickness (mm)	**2.5**	**2.5**	**2.5**
Interval (mm)	**N/A**	**N/A**	**N/A**
Recon 2 (Secondary)			
DFOV	**22**	**22**	**22**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**2500/350**	**2500/350**	**2500/350**
Recon Option	**Full**	**Full**	**Full**
Recon Option			
ASiR/ASiR256/DLIR	**None**	**None**	**None**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**N/A**	**N/A**	**N/A**

Neck (Parathyroid Adenoma) 3.4/3.5/3.6

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Indication

Hypercalcemia, parathryoid adenoma (suspected or confirmed), parathyroid surgical planning.

Oral Contrast

None

Pre-Scan Instructions

- Start an 18g right sided IV to minimize streak artifact in the region of the thyroid. On the right side, the subclavian dumps directly into the superior vena cava. On the left it has to travel across the midline of the neck, creating streak artifact right where we are most likely to see parathryoid adenomas.
- **This exam is scanned in 4 series. Series 1 are the PA and Lateral Scouts. Series 2 is the limited non contrast neck. Series 3 is an arterial neck. Series 4 is scanned immediately to follow as a Limited Coverage Routine Neck.**
- Patient Positioning: Tilt the patient's head so that a line connecting the lateral canthus of the eye and the EAC is perpendicular to the CT tabletop (see head CT protocol).
- Remove any dentures or removable teeth; please place the shoulders as low as possible

IV Contrast Parameters 350

Select Ulrich protocols 19-21

Weight Ranges	Contrast Dosage	Injection Rate
<200 lbs. (<90 kg)	86 mL Iohexol 350 mgI/mL + 50 mL NaCl flush	4 mL/sec
200-300 lbs (90-136 kg)	103 mL Iohexol 350 mgI/mL + 50 mL NaCl flush	4.5 mL/sec
>300 lbs (>136 kg)	124 mL Iohexol 350 mgI/mL + 50 mL NaCl flush	5 mL/sec

IV Contrast Parameters 300/370

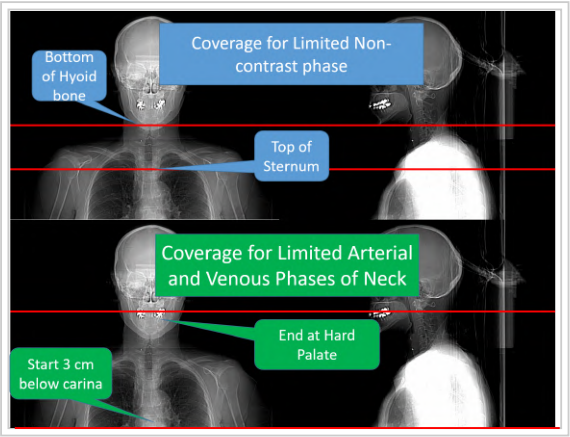
Weight Ranges	Contrast Dosage	Injection Rate
<200 lbs. (<90 kg)	100 mL Iohexol 300 mgI/mL + 50 mL NaCl flush	4 mL/sec
200-300 lbs (90-136 kg)	120 mL Iohexol 300 mgI/mL + 50 mL NaCl flush	4.5 mL/sec
>300 lbs (>136 kg)	145 mL Iohexol 300 mgI/mL + 50 mL NaCl flush	5 mL/sec

Field of View

1. Series 2: 20 cm
2. Series 3: 30 cm (as in routine neck CT)

Scan Description

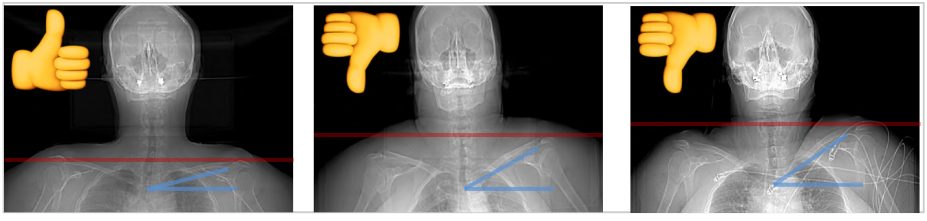
- **Series 1** – Scouts PA and Lateral
- **Series 2** - Limited Non Contrast Phase: Start scan at top of sternum through hyoid
- **Series 3** - Arterial Phase of Lower Neck: Start scans **3 cm below** the Carina and scan to the Hard Palate. Scan Series 4 (limited coverage routine neck) immediately after the arterial neck, without any delay.
    - Smart Prep: Over aortic arch (initiate scan at the entry of contrast in the aortic arch)



- **Series 4** – Limited Routine Neck: Start the scan **3 cm below** the Carina and scan to the top of the Hard Palate.
  - Do not use any CT scan delay, start scanning the Limited Routine Neck CT immediately after Series 3 is finished.
  - Perform angled views if necessary

(Revolution 256) Manual Angled Extension Views (the scanner does not tilt)- If there is a significant amount of metal artifact from dental work do the following:

-
  - Have the patient extend their neck as far back as possible. If necessary, place a rolled towel underneath the patient's shoulder to force extension in the neck.
  - Scout patient in new position
  - Coverage: From the bottom of the teeth through the mandible.



Examples of good and bad shoulder position relative to the neck. The techniques listed above can get a patient from having a poor positioning of the shoulder to a good position. Note: try to recognize improper shoulder relaxation before you scout. If, however, you only notice this after you scout, there is no need to re-scout the patient after they move their shoulders.

Reformat Instructions

No reformats needed from the limited non contrast neck. Radiologists can create reformats if needed from the thin soft tissue images. Bone reformats are needed only for the routine neck phase, not the arterial phase.

Reformats

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
SA ST	Thin ST (from arterial phase)	Manual	Average	300/35	3	1.5	Sagittal
CO ST	Thin ST (from arterial phase)	Manual	Average	300/35	3	1.5	Coronal
SA ST	Thin ST (from routine neck phase)	Manual	Average	300/35	3	1.5	Sagittal
CO ST	Thin ST (from routine neck phase)	Manual	Average	300/35	3	1.5	Coronal
CO BONE	Thin Bone (from routine neck phase)	Manual	Average	2500/350	1.5	0.75	Coronal
SA BONE	Thin Bone (from routine neck phase)	Manual	Average	2500/350	1.5	0.75	Sagittal

Networking

- All Images to PACS (ALI_Store). Do not send Thin Bone or Thin STD (non-MAR) these recons are made solely to build reformats from.
- Send both standard and bone plus series for the angled axial images to PACS (ALI_Store).
- Note: if smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

All MAR recons and reformats should be sent to PACS (ALI_Store). Label MAR reformats with the word "MAR" at the end, for example "CO ST MAR".

Miscellaneous

None

Acquisition Parameters

Series 1, Scout

	Small Adult	Medium Adult	Large Adult
Scout 1 kV	120	140	140
Scout 1 mA	10	10	10
Scout 1 Angle	180	180	180
Scout 2 kV	120	140	140
Scout 2 mA	80	80	80
Scout 2 Angle	90	90	90
WW/WL for Scout	500/50	500/50	500/50

Series 2, Scan Phase

	Small Adult	Medium Adult	Large Adult
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**40**	**40**	**40**
Detector Rows	**64.0**	**64.0**	**64.0**
Detector Configuration	**64x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Large Body**	**Large Body**	**Large Body**
Pitch	**0.516**	**0.516**	**0.516**
Speed (mm/rot)	**20.60**	**20.60**	**20.60**
Rotation Time (s)	**0.5**	**0.5**	**0.5**
kV	**120**	**120**	**120**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(240-560)**	**(240-560)**	**(240-560)**
Manual mA	**410.0**	**410.0**	**410.0**
Noise Index	**11.3**	**11.3**	**11.3**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Series 2, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**30**	**30**	**30**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**300/35**	**300/35**	**300/35**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**80% / 40% / High**	**80% / 40% / High**	**80% / 40% / High**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Series 3, Smart Prep

	Small	Medium	Large
mA	**40**	**40**	**40**
Monitoring Delay (sec)	**10**	**10**	**10**
Monitoring ISD (sec)	**2.0**	**2.0**	**2.0**
Enhancement Threshold (HU)	**50**	**50**	**50**
Diagnostic Delay	**Auto Minimum**	**Auto Minimum**	**Auto Minimum**

Series 3, Scan Phase

	Small Adult	Medium Adult	Large Adult
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**20**	**20**	**20**
Detector Rows	**32.0**	**32.0**	**32.0**
Detector Configuration	**32x0.625**	**32x0.625**	**32x0.625**
Scan FOV	**Large Body**	**Large Body**	**Large Body**
Pitch	**0.531**	**0.531**	**0.531**
Speed (mm/rot)	**10.60**	**10.60**	**10.60**
Rotation Time (s)	**0.8**	**1**	**1**
kV	**100**	**120**	**140**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(140-440)**	**(130-530)**	**(130-515)**
Manual mA	**340.0**	**330.0**	**330.0**
Noise Index	**18.2**	**20.8**	**26.6**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Series 3, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**30**	**30**	**30**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**300/35**	**300/35**	**300/35**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**80% / 40% / High**	**80% / 40% / High**	**80% / 40% / High**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Series 4, Scan Phase

	Small	Medium	Large
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**20**	**20**	**20**
Detector Rows	**32.0**	**32.0**	**32.0**
Detector Configuration	**32x0.625**	**32x0.625**	**32x0.625**
Scan FOV	**Large Body**	**Large Body**	**Large Body**
Pitch	**0.531**	**0.531**	**0.531**
Speed (mm/rot)	**10.60**	**10.60**	**10.60**
Rotation Time (s)	**0.8**	**1**	**1**
kV	**100**	**120**	**140**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(140-440)**	**(130-530)**	**(130-515)**
Manual mA	**340.0**	**330.0**	**330.0**
Noise Index	**12.9**	**14.7**	**18.8**
Slice Thickness (mm)	**2.5**	**2.5**	**2.5**
Interval (mm)	**1.5**	**1.5**	**1.5**

Series 4, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**30**	**30**	**30**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**300/35**	**300/35**	**300/35**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option			
ASiR/ASiR256/DLIR	**60% / 30% / Medium**	**60% / 30% / Medium**	**60% / 30% / Medium**
Slice Thickness (mm)	**2.5**	**2.5**	**2.5**
Interval (mm)	**1.5**	**1.5**	**1.5**
Recon 2 (Secondary)			
DFOV	**30**	**30**	**30**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**2500/350**	**2500/350**	**2500/350**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**	**None**	**None**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**
Recon 3 (Secondary)			
DFOV	**30**	**30**	**30**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**300/35**	**300/35**	**300/35**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
Recon Option	**MARS On**	**MARS On**	**MARS On**
ASiR/ASiR256/DLIR	**80% / 40% / High**	**80% / 40% / High**	**80% / 40% / High**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**
Recon 4 (Secondary)			
DFOV	**30**	**30**	**30**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**2500/350**	**2500/350**	**2500/350**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
Recon Option	**None**	**None**	**None**
ASiR/ASiR256/DLIR	**0.625**	**0.625**	**0.625**
Slice Thickness (mm)	**0.312**	**0.312**	**0.312**
Interval (mm)			

16 & 32 Slice Scanner Exceptions:

1. The 0.625mm slice thickness x 0.312mm interval Recon should be 1.25mm slice thickness x 0.625mm interval on 16 and 32 slice CT scanners. The 16 and 32 slice scanners are only able to recon down to 0.625mm slice thickness when using 10mm and/or 20mm beam collimation respectively. However, when using 20mm and/or 40mm beam collimation, they are only capable of reconstructing to 1.25mm slice thickness.
2. MARS feature is not an option.
3. IQ Enhance feature requires thin slices (1.25mm or less) with an interval of half (or less). On older scanner models, in order to enable IQ Enhance at 0.625 mm slice thickness, the interval must be set to 0.311 mm instead of 0.312 mm.

Series 5, Group 1, Scan Phase

	Small	Medium	Large
Scan Type	**Axial**	**Axial**	**Axial**
Beam Collimation	**20**	**20**	**20**
Detector Rows	**32.0**	**32.0**	**32.0**
Detector Configuration	**32x0.625**	**32x0.625**	**32x0.625**
Scan FOV	**Large Body**	**Large Body**	**Large Body**
Pitch	**1**	**1**	**1**
Speed (mm/rot)	**20.00**	**20.00**	**20.00**
Rotation Time (s)	**0.9**	**0.9**	**0.9**
kV	**120**	**120**	**120**
AEC type	**Manual mA**	**Manual mA**	**Manual mA**
mA Range	**(130-550)**	**(130-550)**	**(130-550)**
Manual mA	**330.0**	**330.0**	**330.0**
Noise Index	**4.8**	**4.8**	**4.8**
Slice Thickness (mm)	**2.5**	**2.5**	**2.5**
Interval (mm)	**20**	**20**	**20**

Series 5, Group 1, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**22**	**22**	**22**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**300/35**	**300/35**	**300/35**
Recon Option	**Full**	**Full**	**Full**
Recon Option			
ASiR/ASiR256/DLIR	**60% / 30% / High**	**60% / 30% / High**	**60% / 30% / High**
Slice Thickness (mm)	**2.5**	**2.5**	**2.5**
Interval (mm)	**N/A**	**N/A**	**N/A**
Recon 2 (Secondary)			
DFOV	**25**	**25**	**25**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**2500/350**	**2500/350**	**2500/350**
Recon Option	**Full**	**Full**	**Full**
Recon Option			
ASiR/ASiR256/DLIR	**None**	**None**	**None**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**N/A**	**N/A**	**N/A**

Series 5, Group 2, Scan Phase

	Small	Medium	Large
Scan Type	**Axial**	**Axial**	**Axial**
Beam Collimation	**20**	**20**	**20**
Detector Rows	**32.0**	**32.0**	**32.0**
Detector Configuration	**32x0.625**	**32x0.625**	**32x0.625**
Scan FOV	**Large Body**	**Large Body**	**Large Body**
Pitch	**1**	**1**	**1**
Speed (mm/rot)	**20.00**	**20.00**	**20.00**
Rotation Time (s)	**0.9**	**0.9**	**0.9**
kV	**120**	**120**	**120**
AEC type	**Manual mA**	**Manual mA**	**Manual mA**
mA Range	**(130-550)**	**(130-550)**	**(130-550)**
Manual mA	**330.0**	**330.0**	**330.0**
Noise Index	**4.8**	**4.8**	**4.8**
Slice Thickness (mm)	**2.5**	**2.5**	**2.5**
Interval (mm)	**20**	**20**	**20**

Series 5, Group 2, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**22**	**22**	**22**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**300/35**	**300/35**	**300/35**
Recon Option	**Full**	**Full**	**Full**
Recon Option			
ASiR/ASiR256/DLIR	**60% / 30% / High**	**60% / 30% / High**	**60% / 30% / High**
Slice Thickness (mm)	**2.5**	**2.5**	**2.5**
Interval (mm)	**N/A**	**N/A**	**N/A**
Recon 2 (Secondary)			
DFOV	**25**	**25**	**25**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**2500/350**	**2500/350**	**2500/350**
Recon Option	**Full**	**Full**	**Full**
Recon Option			
ASiR/ASiR256/DLIR	**None**	**None**	**None**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**N/A**	**N/A**	**N/A**

Neck (Salivary Gland) 3.8/3.9/3.10

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Indication

Salivary gland swelling, Sialadenitis, Sialolith

Oral Contrast

None

Pre-Scan Instructions

- Patient Supine (PA and lateral scouts from sella to mid chest)
- Make sure the patient removes any dentures or removable teeth
- No gantry angle
- Remove all metallic and high-density objects from the scanning area.

IV Contrast Parameters 350

Select Ulrich Protocols 16-18

ADULTS

Weight Ranges	Contrast Dosage	Injection Rate
<200 lbs. (<90 kg)	51 mL Iohexol 350 mgI/mL PAUSE 60 SECONDS AND THEN 34 mL Iohexol 350 mgI/mL + 50 mL NaCl flush	Contrast: 2 mL/sec NaCl flush: 3 mL/sec
200-300 lbs (90-136 kg)	64 mL Iohexol 350 mgI/mL PAUSE 60 SECONDS AND THEN 43 mL Iohexol 350 mgI/mL + 50 mL NaCl flush	Contrast: 2.5 mL/sec NaCl flush: 3 mL/sec
>300 lbs (>136 kg)	73 mL Iohexol 350 mgI/mL PAUSE 60 SECONDS AND THEN 47 mL Iohexol 350 mgI/mL + 50 mL NaCl flush	Contrast: 3 mL/sec NaCl flush: 3 mL/sec
Delay for Adults: (18 Yrs and Up) 115 sec after start of injection		

IV Contrast Parameters 300/370

ADULTS

Weight Ranges	Contrast Dosage	Injection Rate
<200 lbs. (<90 kg)	60 mL Iohexol 300 mgI/mL PAUSE 60 SECONDS AND THEN 40 mL Iohexol 300 mgI/mL + 50 mL NaCl flush	Contrast: 2 mL/sec NaCl flush: 3 mL/sec
200-300 lbs (90-136 kg)	75 mL Iohexol 300 mgI/mL PAUSE 60 SECONDS AND THEN 50 mL Iohexol 300 mgI/mL + 50 mL NaCl flush	Contrast: 2.5 mL/sec NaCl flush: 3 mL/sec
>300 lbs (>136 kg)	85 mL Iohexol 300 mgI/mL PAUSE 60 SECONDS AND THEN 55 mL Iohexol 300 mgI/mL + 50 mL NaCl flush	Contrast: 3 mL/sec NaCl flush: 3 mL/sec
Delay for Adults: (18 Yrs and Up) 115 sec after start of injection		

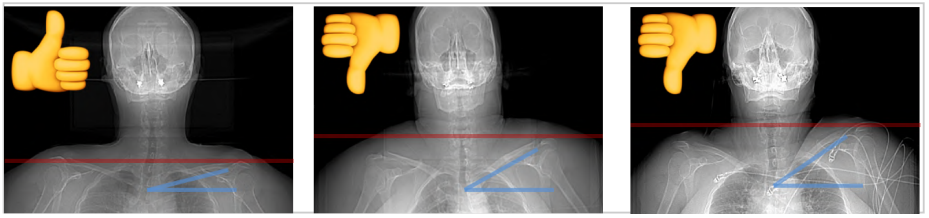
Field of View

22 FOV for arterial

Preferred 30 cm

Scan Description

- Series 1: Scouts - PA and Lateral
- Series 2: Limited Non-contrast CT of Neck
  - Coverage: Scan from hyoid bone to EAC
  - No 2D Reconstructions
  - Use same scan factors as in routine neck CT
- Series 3: Do a routine Neck CT With Contrast Protocol
  - Be sure to do angled views if there are lots of dental fillings



Examples of good and bad shoulder position relative to the neck. The techniques listed above can get a patient from having a poor positioning of the shoulder to a good position. Note: try to recognize improper shoulder relaxation before you scout. If, however, you only notice this after you scout, there is no need to re-scout the patient after they move their shoulders.

- Verify that the arms are outside of the CT wrap, and that the shoulders are relaxed down toward the feet as far as possible. Measure the width of the shoulders through the level of the mid-humeral head, as shown below.
- Check BMI
- Select small, medium and large based on the table below.

Measure width through mid-humeral heads	Small	Medium	Large
	Shoulder width less than 46 cm *OR* BMI less than 26	**Shoulder Width 46 to 50 cm**	**Shoulder width greater than 50 cm *OR* BMI greater than 35**

Reformat Instructions

- Reformats should cover from the tip of the nose through the back of the neck.
- Only send STD AND BONE to PACS. Use THIN ST for the soft tissue Reformats. Use THIN BONE for the bone Reformats.**For the soft tissue: Perform 2D reformats from Recon 3 in both the coronal and sagittal planes, using a 3 mm thickness and 1.5 mm increment.
- For bone: Perform 2D reformats from THIN BONE for both the coronal and sagittal planes, using a 1.5 mm thickness and 0.75 mm increment.

Reformats

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
CO ST	Thin ST	Manual	Average	300/35	3	1.5	Coronal
CO BONE	Thin Bone	Manual	Average	2500/350	1.5	0.75	Coronal
SA ST	Thin ST	Manual	Average	300/35	3	1.5	Sagittal
SA BONE	Thin Bone	Manual	Average	2500/350	1.5	0.75	Sagittal

Networking

- All Images to PACS (ALI_Store). Do not send Thin Bone or Thin STD (non-MAR) these recons are made solely to build reformats from.
- Send both standard and bone plus series for the angled axial images to PACS (ALI_Store).
- Note: if smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

All MAR recons and reformats should be sent to PACS (ALI_Store). Label MAR reformats with the word "MAR" at the end, for example "CO ST MAR".

Miscellaneous

None

Acquisition Parameters

Series 1, Scout

	Small	Medium	Large
Scout 1 kV	**120**	**140**	**140**
Scout 1 mA	**10**	**10**	**10**
Scout 1 Angle	**180**	**180**	**180**
Scout 2 kV	**120**	**140**	**140**
Scout 2 mA	**80**	**80**	**80**
Scout 2 Angle	**90**	**90**	**90**
WW/WL for Scout	**500/50**	**500/50**	**500/50**

Series 2, Scan Phase

	Small	Medium	Large
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**20**	**20**	**20**
Detector Rows	**32.0**	**32.0**	**32.0**
Detector Configuration	**32x0.625**	**32x0.625**	**32x0.625**
Scan FOV	**Large Body**	**Large Body**	**Large Body**
Pitch	**0.531**	**0.531**	**0.531**
Speed (mm/rot)	**10.60**	**10.60**	**10.60**
Rotation Time (s)	**0.8**	**1**	**1**
kV	**100**	**120**	**140**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(140-440)**	**(130-530)**	**(130-515)**
Manual mA	**340.0**	**330.0**	**330.0**
Noise Index	**12.9**	**14.7**	**18.8**
Slice Thickness (mm)	**2.5**	**2.5**	**2.5**
Interval (mm)	**1.5**	**1.5**	**1.5**

Series 2, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**22**	**22**	**22**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**300/35**	**300/35**	**300/35**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option			
ASiR/ASiR256/DLIR	**60% / 30% / Medium**	**60% / 30% / Medium**	**60% / 30% / Medium**
Slice Thickness (mm)	**2.5**	**2.5**	**2.5**
Interval (mm)	**1.5**	**1.5**	**1.5**
Recon 2 (Secondary)			
DFOV	**22**	**22**	**22**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**2500/350**	**2500/350**	**2500/350**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**	**None**	**None**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Series 3, Scan Phase

	Small	Medium	Large
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**20**	**20**	**20**
Detector Rows	**32.0**	**32.0**	**32.0**
Detector Configuration	**32x0.625**	**32x0.625**	**32x0.625**
Scan FOV	**Large Body**	**Large Body**	**Large Body**
Pitch	**0.531**	**0.531**	**0.531**
Speed (mm/rot)	**10.60**	**10.60**	**10.60**
Rotation Time (s)	**0.8**	**1**	**1**
kV	**100**	**120**	**140**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(140-440)**	**(130-530)**	**(130-515)**
Manual mA	**340.0**	**330.0**	**330.0**
Noise Index	**12.9**	**14.7**	**18.8**
Slice Thickness (mm)	**2.5**	**2.5**	**2.5**
Interval (mm)	**1.5**	**1.5**	**1.5**

Series 3, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**22**	**22**	**22**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**300/35**	**300/35**	**300/35**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option			
ASiR/ASiR256/DLIR	**60% / 30% / Medium**	**60% / 30% / Medium**	**60% / 30% / Medium**
Slice Thickness (mm)	**2.5**	**2.5**	**2.5**
Interval (mm)	**1.5**	**1.5**	**1.5**
Recon 2 (Secondary)			
DFOV	**22**	**22**	**22**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**2500/350**	**2500/350**	**2500/350**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**	**None**	**None**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**
Recon 3 (Secondary)			
DFOV	**30**	**30**	**30**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**300/35**	**300/35**	**300/35**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
Recon Option	**MARS On**	**MARS On**	**MARS On**
ASiR/ASiR256/DLIR	**80% / 40% / High**	**80% / 40% / High**	**80% / 40% / High**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**
Recon 4 (Secondary)			
DFOV	**30**	**30**	**30**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**2500/350**	**2500/350**	**2500/350**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
Recon Option	**None**	**None**	**None**
ASiR/ASiR256/DLIR	**0.625**	**0.625**	**0.625**
Slice Thickness (mm)	**0.312**	**0.312**	**0.312**
Interval (mm)			

16 & 32 Slice Scanner Exceptions:

1. The 0.625mm slice thickness x 0.312mm interval Recon should be 1.25mm slice thickness x 0.625mm interval on 16 and 32 slice CT scanners. The 16 and 32 slice scanners are only able to recon down to 0.625mm slice thickness when using 10mm and/or 20mm beam collimation respectively. However, when using 20mm and/or 40mm beam collimation, they are only capable of reconstructing to 1.25mm slice thickness.
2. MARS feature is not an option.
3. IQ Enhance feature requires thin slices (1.25mm or less) with an interval of half (or less). On older scanner models, in order to enable IQ Enhance at 0.625 mm slice thickness, the interval must be set to 0.311 mm instead of 0.312 mm.

Series 4, Group 1, Scan Phase

	Small	Medium	Large
Scan Type	**Axial**	**Axial**	**Axial**
Beam Collimation	**20**	**20**	**20**
Detector Rows	**32.0**	**32.0**	**32.0**
Detector Configuration	**32x0.625**	**32x0.625**	**32x0.625**
Scan FOV	**Large Body**	**Large Body**	**Large Body**
Pitch	**1**	**1**	**1**
Speed (mm/rot)	**20.00**	**20.00**	**20.00**
Rotation Time (s)	**0.9**	**0.9**	**0.9**
kV	**120**	**120**	**120**
AEC type	**Manual mA**	**Manual mA**	**Manual mA**
mA Range	**(130-550)**	**(130-550)**	**(130-550)**
Manual mA	**330.0**	**330.0**	**330.0**
Noise Index	**4.8**	**4.8**	**4.8**
Slice Thickness (mm)	**2.5**	**2.5**	**2.5**
Interval (mm)	**20**	**20**	**20**

Series 4, Group 1, Recons

Recon 1 (Primary)	Small	Medium	Large
DFOV	**22**	**22**	**22**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**300/35**	**300/35**	**300/35**
Recon Option	**Full**	**Full**	**Full**
Recon Option			
ASiR/ASiR256/DLIR	**60% / 30% / High**	**60% / 30% / High**	**60% / 30% / High**
Slice Thickness (mm)	**2.5**	**2.5**	**2.5**
Interval (mm)	**N/A**	**N/A**	**N/A**
Recon 2 (Secondary)	Small	Medium	Large
DFOV	**22**	**22**	**22**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**2500/350**	**2500/350**	**2500/350**
Recon Option	**Full**	**Full**	**Full**
Recon Option			
ASiR/ASiR256/DLIR	**None**	**None**	**None**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**N/A**	**N/A**	**N/A**

Series 4, Group 2, Scan Phase

	Small	Medium	Large
Scan Type	**Axial**	**Axial**	**Axial**
Beam Collimation	**20**	**20**	**20**
Detector Rows	**32.0**	**32.0**	**32.0**
Detector Configuration	**32x0.625**	**32x0.625**	**32x0.625**
Scan FOV	**Large Body**	**Large Body**	**Large Body**
Pitch	**1**	**1**	**1**
Speed (mm/rot)	**20.00**	**20.00**	**20.00**
Rotation Time (s)	**0.9**	**0.9**	**0.9**
kV	**120**	**120**	**120**
AEC type	**Manual mA**	**Manual mA**	**Manual mA**
mA Range	**(130-550)**	**(130-550)**	**(130-550)**
Manual mA	**330.0**	**330.0**	**330.0**
Noise Index	**4.8**	**4.8**	**4.8**
Slice Thickness (mm)	**2.5**	**2.5**	**2.5**
Interval (mm)	**20**	**20**	**20**

Series 4, Group 2, Recons

Recon 1 (Primary)	Small	Medium	Large
DFOV	**22**	**22**	**22**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**300/35**	**300/35**	**300/35**
Recon Option	**Full**	**Full**	**Full**
Recon Option			
ASiR/ASiR256/DLIR	**60% / 30% / High**	**60% / 30% / High**	**60% / 30% / High**
Slice Thickness (mm)	**2.5**	**2.5**	**2.5**
Interval (mm)	**N/A**	**N/A**	**N/A**
Recon 2 (Secondary)			
DFOV	**22**	**22**	**22**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**2500/350**	**2500/350**	**2500/350**
Recon Option	**Full**	**Full**	**Full**
Recon Option			
ASiR/ASiR256/DLIR	**None**	**None**	**None**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**N/A**	**N/A**	**N/A**

CTA Neck Only (Cerebrovascular Disease) 3.11

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Indication

Carotid Stenosis, Vertebral stenosis, dissection, trauma, hemorrhage

Video for this protocol

Oral Contrast

None

Pre-Scan Instructions

- Start an 18g right sided IV. If it is a stroke code and an IV is already placed, please do not re-stick the patient.
- Extend the scouts to include the aortic arch for smart prep.
- Patient Positioning: Tilt the patient's head so that a line connecting the lateral canthus of the eye and the EAC is perpendicular to the CT tabletop (see head CT protocol).
- Remove all metallic and high-density objects from the scanning area.

IV Contrast Parameters 350

Select Ulrich Protocol 7-9

Adult CTA

Weight Ranges	Contrast Dosage	Injection Rate
<200 lbs. (<90 kg)	85 mL of Iohexol 350 mgI/mL + 50 mL NaCl flush	4 mL/sec
200-300 lbs (90-136 kg)	106 mL of Iohexol 350 mgI/mL + 50 mL NaCl flush	5 mL/sec
>300 lbs (>136 kg)	127 mL of Iohexol 350 mgI/mL + 50 mL NaCl flush	5 mL/sec

IV Contrast Parameters 300/370

Adult CTA

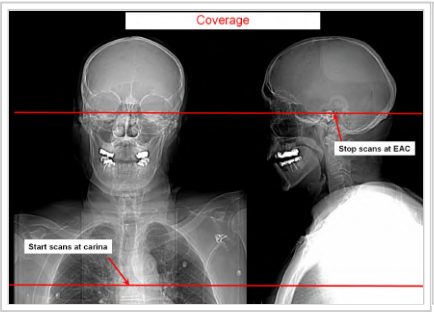
Weight Ranges	Contrast Dosage	Injection Rate
<200 lbs. (<90 kg)	80 mL of Iopamidol 370 mgI/mL (Isovue) + 50 mL NaCl flush	4 mL/sec
200-300 lbs (90-136 kg)	100 mL of Iopamidol 370 mgI/ml (Isovue) + 50 mL NaCl flush	5 mL/sec
>300 lbs (>136 kg)	120 mL of Iopamidol 370 mgI/mL (Isovue) + 50 mL NaCl flush	5 mL/sec

Field of View

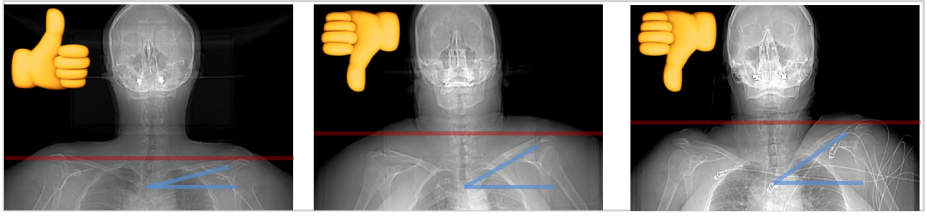
Preferred 22 cm

Scan Description

- **Series 1** – Scouts PA and Lateral
- **Series 2** - CTA Neck Only: Scan from Carina and end at EAC (bottom to top.)
  - Smart Prep: place ROI on aortic arch (initiate the scan at contrast entry)



- **Series 3** - Optional - **For patients needing a Delay Routine CT Neck after the CTA Neck use the Routine CT neck protocol and obtain the scan at 80 seconds from the start of the contrast injection.**



Examples of good and bad shoulder position relative to the neck. The techniques listed above can get a patient from having a poor positioning of the shoulder to a good position. Note: try to recognize improper shoulder relaxation before you scout. If, however, you only notice this after you scout, there is no need to re-scout the patient after they move their shoulders.

Reformat Instructions

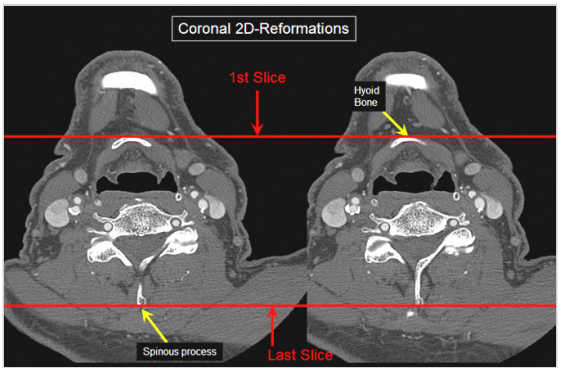
Please send all images to PACS before starting reformats. See table below for reformat instructions.

In the United States, CT Angiography CPT codes require the performance and documentation of 3D angiographic rendering, which may include maximum intensity projection (MIP), volumetric rendering, and/or surface rendering techniques.

Reformats

2D MIP-Reformations through the vertebral and carotid arteries

- Use an axial image near the level of the hyoid bone at the carotid bifurcation to prescribe the correct oblique angles. Use an image that shows the external and internal carotid arteries.
- Choose only the axial images from the aortic arch to the EAC.
- Include both the carotid and vertebral arteries (See example below)
- Send all images to ALI Store (PACS).



Coronal and Sagittal 2D- MIP Reformats
Through Carotid Bifurcations

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
SA	Thin ST	Manual	MIP	800/200	10	2.5	sagittal
CO	Thin ST	Manual	MIP	800/200	10	2.5	coronal
SA ST	Thin ST	Manual	Average	300/35	3	1.5	Sagittal

Networking

- All Images to PACS (ALI_Store).
- Note: if smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

All MAR recons and reformats should be sent to PACS (ALI_Store). Label MAR reformats with the word "MAR" at the end, for example "CO ST MAR".

Miscellaneous

Choose the CT scan factors on the scanner for the proper age range of the patient:

- Adult: (>= 18 years)
- Adolescent: (7 - 17 years)
- Child: (3 – 6 years)
- Infant: (0 – 2 years)

Acquisition Parameters

Series 1, Scout

	Adult
Scout 1 kV	120
Scout 1 mA	10
Scout 1 Angle	180
Scout 2 kV	120
Scout 2 mA	20
Scout 2 Angle	90
WW/WL for Scout	500/50

Series 2, Smart Prep

	Adult
mA	**80**
Monitoring Delay (sec)	**10**
Monitoring ISD (sec)	**2**
Enhancement Threshold (HU)	**40**
Diagnostic Delay	**Auto Minimum**

Series 2, Scan Phase

	Adult
Scan Type	**Helical**
Beam Collimation	**40**
Detector Rows	**64.0**
Detector Configuration	**64x0.625**
Scan FOV	**Large Body**
Pitch	**0.516**
Speed (mm/rot)	**20.60**
Rotation Time (s)	**0.5**
kV	**120**
AEC type	**smart mA**
mA Range	**(240-560)**
Manual mA	**410.0**
Noise Index	**11.3**
Slice Thickness (mm)	**1.25**
Interval (mm)	**0.625**

16 & 32 Slice Scanner Exceptions:

1. The 0.625mm slice thickness x 0.312mm interval Recon should be 1.25mm slice thickness x 0.625mm interval on 16 and 32 slice CT scanners. The 16 and 32 slice scanners are only able to recon down to 0.625mm slice thickness when using 10mm and/or 20mm beam collimation respectively. However, when using 20mm and/or 40mm beam collimation, they are only capable of reconstructing to 1.25mm slice thickness.
2. MARS feature is not an option.
3. IQ Enhance feature requires thin slices (1.25mm or less) with an interval of half (or less). On older scanner models, in order to enable IQ Enhance at 0.625 mm slice thickness, the interval must be set to 0.311 mm instead of 0.312 mm.

Series 2, Recons

	Adult
Recon 1 (Primary)	
DFOV	**22**
Recon Type	**Standard**
WW/WL	**450/50**
Recon Option	**Plus**
Recon Option	**IQ Enhance**
ASiR/ASiR256/DLIR	**60% / 30% / High**
Slice Thickness (mm)	**1.25**
Interval (mm)	**0.625**
Recon 2 (Secondary)	
DFOV	**22**
Recon Type	**Bone Plus**
WW/WL	**2500/350**
Recon Option	**Plus**
Recon Option	**IQ Enhance**
Recon Option	**None**
ASiR/ASiR256/DLIR	**1.25**
Slice Thickness (mm)	**0.625**
Interval (mm)	
Recon 3 (Secondary)	
DFOV	**22**
Recon Type	**Standard**
WW/WL	**450/50**
Recon Option	**Plus**
Recon Option	**IQ Enhance**
Recon Option	**MARS On**
ASiR/ASiR256/DLIR	**60% / 30% / High**
Slice Thickness (mm)	**1.25**
Interval (mm)	**0.625**

Neck (Hypervascular Papillary Thyroid) 3.13/3.14/3.15

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Indication

Hypervascular tumor, especially concern for papillary thyroid cancer metastasis.

Oral Contrast

None

Pre-Scan Instructions

- Start an 18g right sided IV to minimize streak artifact in the region of the thyroid. On the right side, the subclavian dumps directly into the superior vena cava. On the left it has to travel across the midline of the neck, creating streak artifact right where we are most likely to see thyroid pathology.
- Patient Positioning: Tilt the patient's head so that a line connecting the lateral canthus of the eye and the EAC is perpendicular to the CT tabletop (see head CT protocol).
- Remove any dentures or removable teeth; please place the shoulders as low as possible

IV Contrast Parameters 350

Select Ulrich protocols 19-21

Weight Ranges	Contrast Dosage	Injection Rate
<200 lbs. (<90 kg)	86 mL Iohexol 350 mgI/mL + 50 mL NaCl flush	4 mL/sec
200-300 lbs (90-136 kg)	103 mL Iohexol 350 mgI/mL + 50 mL NaCl flush	4.5 mL/sec
>300 lbs (>136 kg)	124 mL Iohexol 350 mgI/mL + 50 mL NaCl flush	5 mL/sec

IV Contrast Parameters 300/370

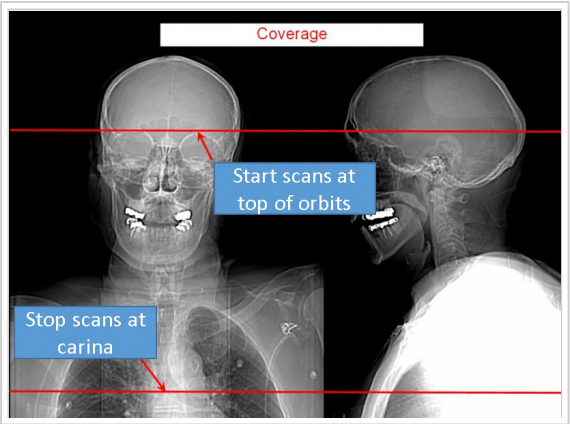
Weight Ranges	Contrast Dosage	Injection Rate
<200 lbs. (<90 kg)	100 mL Iohexol 300 mgI/mL + 50 mL NaCl flush	4 mL/sec
200-300 lbs (90-136 kg)	120 mL Iohexol 300 mgI/mL + 50 mL NaCl flush	4.5 mL/sec
>300 lbs (>136 kg)	145 mL Iohexol 300 mgI/mL + 50 mL NaCl flush	5 mL/sec

Field of View

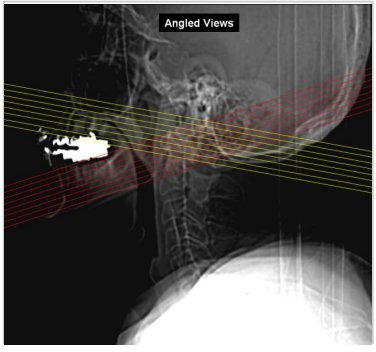
1. Series 2: 20 cm
2. Series 3: 30 cm (as in routine neck CT)

Scan Description

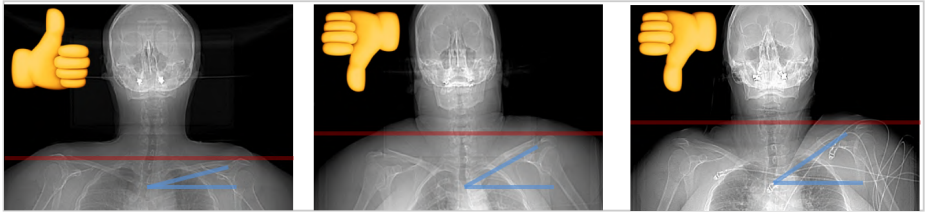
- **Series 1** – Scouts PA and Lateral
- **Series 2** - Arterial Phase: Start the scan at the carina, scan to the top of the orbit.
  - Remind the patient not to swallow during the scan.
  - Scan Series 3 (routine neck) immediately after the arterial neck, without any delay.
  - Smart Prep: Over aortic arch (initiate scan at the entry of contrast in the aortic arch)



- **Series 3** – Routine Neck:
  - Coverage - Start the scan at the top of the orbit, scan to the carina.
  - Timing - No delay, start scanning the routine neck CT immediately after Series 2 is finished.
- **Series 4** - Angled Axials- If there is a significant amount of metal artifact from dental work
  - Non Revolution CT (Rev 256) perform angled axials at 2 different angels. (see below picture)
  - Revolution CT (Rev 256)
    - Have the patient extend their neck as far back as possible. If necessary, place a rolled towel underneath the patient's shoulder to force extension in the neck.
    - Scout patient in new position
    - Coverage: From the bottom of the teeth through the mandible.



Angled Views (only on non Revolution CT (Rev 256) scanners)



Examples of good and bad shoulder position relative to the neck. The techniques listed above can get a patient from having a poor positioning of the shoulder to a good position. Note: try to recognize improper shoulder relaxation before you scout. If, however, you only notice this after you scout, there is no need to re-scout the patient after they move their shoulders.

Reformat Instructions

See table below.

Reformats

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
SA ST	Thin ST (from arterial phase)	Manual	Average	300/35	3	1.5	Sagittal
CO ST	Thin ST (from arterial phase)	Manual	Average	300/35	3	1.5	Coronal
SA ST	Thin ST (from routine neck phase)	Manual	Average	300/35	3	1.5	Sagittal
CO ST	Thin ST (from routine neck phase)	Manual	Average	300/35	3	1.5	Coronal
CO BONE	Thin Bone (from routine neck phase)	Manual	Average	2500/350	1.5	0.75	Coronal
SA BONE	Thin Bone (from routine neck phase)	Manual	Average	2500/350	1.5	0.75	Sagittal

Networking

- All Images to PACS (ALI_Store). Do not send Thin Bone or Thin STD (non-MAR) these recons are made solely to build reformats from.
- Send both standard and bone plus series for the angled axial images to PACS (ALI_Store).
- Note: if smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

All MAR recons and reformats should be sent to PACS (ALI_Store). Label MAR reformats with the word "MAR" at the end, for example "CO ST MAR".

Miscellaneous

None

Acquisition Parameters

Series 1, Scout

	Small Adult	Medium Adult	Large Adult
Scout 1 kV	**120**	**140**	**140**
Scout 1 mA	**10**	**10**	**10**
Scout 1 Angle	**180**	**180**	**180**
Scout 2 kV	**120**	**140**	**140**
Scout 2 mA	**80**	**80**	**80**
Scout 2 Angle	**90**	**90**	**90**
WW/WL for Scout	**500/50**	**500/50**	**500/50**

Series 2, Smart Prep

	Small	Medium	Large
mA	**40**	**40**	**40**
Monitoring Delay (sec)	**10**	**10**	**10**
Monitoring ISD (sec)	**2.0**	**2.0**	**2.0**
Enhancement Threshold (HU)	**50**	**50**	**50**
Diagnostic Delay	**Auto Minimum**	**Auto Minimum**	**Auto Minimum**

Series 2, Scan Phase

	Small Adult	Medium Adult	Large Adult
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**20**	**20**	**20**
Detector Rows	**32.0**	**32.0**	**32.0**
Detector Configuration	**32x0.625**	**32x0.625**	**32x0.625**
Scan FOV	**Large Body**	**Large Body**	**Large Body**
Pitch	**0.531**	**0.531**	**0.531**
Speed (mm/rot)	**10.60**	**10.60**	**10.60**
Rotation Time (s)	**0.8**	**1**	**1**
kV	**100**	**120**	**140**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(140-440)**	**(130-530)**	**(130-515)**
Manual mA	**340.0**	**330.0**	**330.0**
Noise Index	**18.2**	**20.8**	**26.6**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Series 2, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**20**	**20**	**20**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**300/35**	**300/35**	**300/35**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**80% / 40% / High**	**80% / 40% / High**	**80% / 40% / High**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Series 3, Scan Phase

	Small	Medium	Large
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**20**	**20**	**20**
Detector Rows	**32.0**	**32.0**	**32.0**
Detector Configuration	**32x0.625**	**32x0.625**	**32x0.625**
Scan FOV	**Large Body**	**Large Body**	**Large Body**
Pitch	**0.531**	**0.531**	**0.531**
Speed (mm/rot)	**10.60**	**10.60**	**10.60**
Rotation Time (s)	**0.8**	**1**	**1**
kV	**100**	**120**	**140**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(140-440)**	**(130-530)**	**(130-515)**
Manual mA	**340.0**	**330.0**	**330.0**
Noise Index	**12.9**	**14.7**	**18.8**
Slice Thickness (mm)	**2.5**	**2.5**	**2.5**
Interval (mm)	**1.5**	**1.5**	**1.5**

Series 3, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**30**	**30**	**30**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**300/35**	**300/35**	**300/35**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option			
ASiR/ASiR256/DLIR	**60% / 30% / Medium**	**60% / 30% / Medium**	**60% / 30% / Medium**
Slice Thickness (mm)	**2.5**	**2.5**	**2.5**
Interval (mm)	**1.5**	**1.5**	**1.5**
Recon 2 (Secondary)			
DFOV	**30**	**30**	**30**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**2500/350**	**2500/350**	**2500/350**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**	**None**	**None**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**
Recon 3 (Secondary)			
DFOV	**30**	**30**	**30**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**300/35**	**300/35**	**300/35**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
Recon Option	**MARS On**	**MARS On**	**MARS On**
ASiR/ASiR256/DLIR	**80% / 40% / High**	**80% / 40% / High**	**80% / 40% / High**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**
Recon 4 (Secondary)			
DFOV	**30**	**30**	**30**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**2500/350**	**2500/350**	**2500/350**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
Recon Option	**None**	**None**	**None**
ASiR/ASiR256/DLIR	**0.625**	**0.625**	**0.625**
Slice Thickness (mm)	**0.312**	**0.312**	**0.312**
Interval (mm)			

16 & 32 Slice Scanner Exceptions:

1. The 0.625mm slice thickness x 0.312mm interval Recon should be 1.25mm slice thickness x 0.625mm interval on 16 and 32 slice CT scanners. The 16 and 32 slice scanners are only able to recon down to 0.625mm slice thickness when using 10mm and/or 20mm beam collimation respectively. However, when using 20mm and/or 40mm beam collimation, they are only capable of reconstructing to 1.25mm slice thickness.
2. MARS feature is not an option.
3. IQ Enhance feature requires thin slices (1.25mm or less) with an interval of half (or less). On older scanner models, in order to enable IQ Enhance at 0.625 mm slice thickness, the interval must be set to 0.311 mm instead of 0.312 mm.

Series 4, Group 1, Scan Phase

	Small	Medium	Large
Scan Type	**Axial**	**Axial**	**Axial**
Beam Collimation	**20**	**20**	**20**
Detector Rows	**32.0**	**32.0**	**32.0**
Detector Configuration	**32x0.625**	**32x0.625**	**32x0.625**
Scan FOV	**Large Body**	**Large Body**	**Large Body**
Pitch	**1**	**1**	**1**
Speed (mm/rot)	**20.00**	**20.00**	**20.00**
Rotation Time (s)	**0.9**	**0.9**	**0.9**
kV	**120**	**120**	**120**
AEC type	**Manual mA**	**Manual mA**	**Manual mA**
mA Range	**(130-550)**	**(130-550)**	**(130-550)**
Manual mA	**330.0**	**330.0**	**330.0**
Noise Index	**4.8**	**4.8**	**4.8**
Slice Thickness (mm)	**2.5**	**2.5**	**2.5**
Interval (mm)	**20**	**20**	**20**

Series 4, Group 1, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**22**	**22**	**22**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**300/35**	**300/35**	**300/35**
Recon Option	**Full**	**Full**	**Full**
Recon Option			
ASiR/ASiR256/DLIR	**60% / 30% / High**	**60% / 30% / High**	**60% / 30% / High**
Slice Thickness (mm)	**2.5**	**2.5**	**2.5**
Interval (mm)	**N/A**	**N/A**	**N/A**
Recon 2 (Secondary)			
DFOV	**25**	**25**	**25**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**2500/350**	**2500/350**	**2500/350**
Recon Option	**Full**	**Full**	**Full**
Recon Option			
ASiR/ASiR256/DLIR	**None**	**None**	**None**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**N/A**	**N/A**	**N/A**

Series 4, Group 2, Scan Phase

	Small	Medium	Large
Scan Type	**Axial**	**Axial**	**Axial**
Beam Collimation	**20**	**20**	**20**
Detector Rows	**32.0**	**32.0**	**32.0**
Detector Configuration	**32x0.625**	**32x0.625**	**32x0.625**
Scan FOV	**Large Body**	**Large Body**	**Large Body**
Pitch	**1**	**1**	**1**
Speed (mm/rot)	**20.00**	**20.00**	**20.00**
Rotation Time (s)	**0.9**	**0.9**	**0.9**
kV	**120**	**120**	**120**
AEC type	**Manual mA**	**Manual mA**	**Manual mA**
mA Range	**(130-550)**	**(130-550)**	**(130-550)**
Manual mA	**330.0**	**330.0**	**330.0**
Noise Index	**4.8**	**4.8**	**4.8**
Slice Thickness (mm)	**2.5**	**2.5**	**2.5**
Interval (mm)	**20**	**20**	**20**

Series 4, Group 2, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**22**	**22**	**22**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**300/35**	**300/35**	**300/35**
Recon Option	**Full**	**Full**	**Full**
Recon Option			
ASiR/ASiR256/DLIR	**60% / 30% / High**	**60% / 30% / High**	**60% / 30% / High**
Slice Thickness (mm)	**2.5**	**2.5**	**2.5**
Interval (mm)	**N/A**	**N/A**	**N/A**
Recon 2 (Secondary)			
DFOV	**25**	**25**	**25**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**2500/350**	**2500/350**	**2500/350**
Recon Option	**Full**	**Full**	**Full**
Recon Option			
ASiR/ASiR256/DLIR	**None**	**None**	**None**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**N/A**	**N/A**	**N/A**

Adult Cervical Spine (without Metal) 3.16/3.17/3.18

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Indication

Trauma, neck pain, cervical stenosis, radiculopathy, fracture, evaluate fixation hardware

Video for this protocol

Oral Contrast

None

Pre-Scan Instructions

- Extend the scouts to include the aortic arch for smart prep if IV contrast is to be used.
- Patient Positioning:
  - Warning: Do not flex or extend the neck if there has been recent spine trauma or if the patient is in a C-Spine trauma collar.
  - If no recent trauma, tilt the patient's head so that a line connecting the lateral canthus of the eye and the EAC is perpendicular to the CT tabletop.
  - The shoulders should be pulled down as much as possible
- Remove all metallic and high-density objects from the scanning area.
- Post T and L Spine Myelogram patients: Please remember to roll the patient 360 degrees before scanning in order to distribute the contrast evenly in the spinal canal.

IV Contrast Parameters 350

Select Ulrich protocols 22-24

Weight Ranges	Contrast Dosage	Injection Rate
<200 lbs. (<90 kg)	69 mL Iohexol 350 mgI/mL + 50 mL NaCl flush	3 mL/sec
200-300 lbs (90-136 kg)	94 mL Iohexol 350 mgI/mL + 50 mL NaCl flush	3.5 mL/sec
>300 lbs (>136 kg)	127 mL of Iohexol 350 mgI/mL + 50 mL NaCl flush	4 mL/sec
Use 103 mL Iohexol 350 mgI/mL if a CT head is to be scanned with the spine. Under smart prep, add a diagnostic delay of 15 seconds for 16 slice scanner and 20 seconds for all other scanners.		

IV Contrast Parameters 300/370

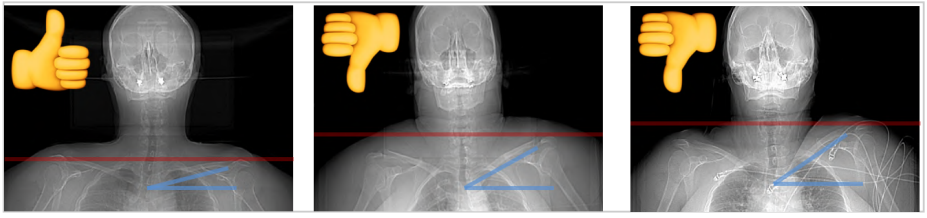
Weight Ranges	Contrast Dosage	Injection Rate
<200 lbs. (<90 kg)	80 mL Iohexol 300 mgI/mL + 50 mL NaCl flush	3 mL/sec
200-300 lbs (90-136 kg)	110 mL Iohexol 300 mgI/mL + 50 mL NaCl flush	3.5 mL/sec
>300 lbs (>136 kg)	120 mL of Iopamidol 370 mgI/mL (Isovue) + 50 mL NaCl flush	4 mL/sec
Use 120 mL if a head is scanned with the spine. Under smart prep, add a diagnostic delay of 15 seconds for 16 slice scanner and 20 seconds for all other scanners.		

Field of View

Preferred 16cm

Scan Description

- Series 1 – Scouts PA and Lateral
- Series 2 – CT C-Spine without: Scan from the top of the sella to the bottom of T2
- Series 3 - CT C-Spine with: Scan from the top of the sella to the bottom of T2
  - Smart Prep: place ROI on the aortic arch.
    - After the arrival of contrast in aortic arch there will be a diagnostic delay: 15 sec (16 slice scanners), 20 sec (64 slice scanners)



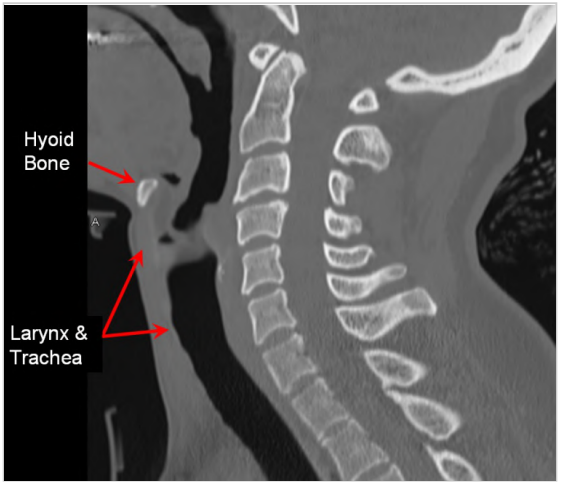
Examples of good and bad shoulder position relative to the neck. The techniques listed above can get a patient from having a poor positioning of the shoulder to a good position. Note: try to recognize improper shoulder relaxation before you scout. If, however, you only notice this after you scout, there is no need to re-scout the patient after they move their shoulders.

- Verify that the arms are outside of the CT wrap, and that the shoulders are relaxed down toward the feet as far as possible. Measure the width of the shoulders through the level of the mid-humeral head, as shown below.
- Check BMI
- Select small, medium and large based on the table below.

Measure width through mid-humeral heads	Small	Medium	Large
	Shoulder width less than 46 cm *OR* BMI less than 26	**Shoulder Width 46 to 50 cm**	**Shoulder width greater than 50 cm *OR* BMI greater than 35**

Reformat Instructions

- If the patient has a lot of metal in their teeth please use the MARS recons for the reformats. MAR is enabled on Adult protocols and Adolescent protocols (ages 7 -17 yrs.).
- If this is an exam solely With contrast or solely Without contrast: Please perform 2D-reformats using both the ST AND the THIN BONE.
- If this is a “With & Without” contrast study: Please perform 2D reformats using ST from the With contrast series and THIN BONE from Non-Contrast series.



Reformats

With or Without Contrast

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
CO ST	Thin ST	Manual	Average	450/50	3	1.5	Coronal
CO BONE	Thin Bone	Manual	Average	2500/350	1.5	0.75	Coronal
SA ST	Thin ST	Manual	Average	450/50	3	1.5	Sagittal
SA BONE	Thin Bone	Manual	Average	2500/350	1.5	0.75	Sagittal

With and Without Contrast

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
CO ST	THIN ST (with contrast phase)	Manual	Average	450/50	3	1.5	Coronal
CO BONE	THIN BONE (without contrast phase)	Manual	Average	2500/350	1.5	0.75	Coronal
SA ST	THIN ST (with contrast phase)	Manual	Average	450/50	3	1.5	Sagittal
SA BONE	THIN BONE (without contrast phase)	Manual	Average	2500/350	1.5	0.75	Sagittal

Networking

- All Images to PACS (ALI_Store). Do not send Thin Bone, these recons are made solely to build reformats from.
- If Metal is present, send THIN ST MAR and build reformats from that series.
- Note: if smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

All MAR recons and reformats should be sent to PACS (ALI_Store). Label MAR reformats with the word "MAR" at the end, for example "CO ST MAR".

Miscellaneous

None

Acquisition Parameters

Series 1, Scout

	Small	Medium	Large
Scout 1 kV	**140**	**140**	**140**
Scout 1 mA	**10**	**10**	**10**
Scout 1 Angle	**180**	**180**	**180**
Scout 2 kV	**140**	**140**	**140**
Scout 2 mA	**80**	**80**	**80**
Scout 2 Angle	**90**	**90**	**90**
WW/WL for Scout	**500/50**	**500/50**	**500/50**

Series 2, Scan Phase

	Small	Medium	Large
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**20**	**20**	**20**
Detector Rows	**32.0**	**32.0**	**32.0**
Detector Configuration	**32x0.625**	**32x0.625**	**32x0.625**
Scan FOV	**Large Body**	**Large Body**	**Large Body**
Pitch	**0.531**	**0.531**	**0.531**
Speed (mm/rot)	**10.60**	**10.60**	**10.60**
Rotation Time (s)	**0.5**	**0.9**	**1**
kV	**120**	**140**	**140**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(180-560)**	**(130-510)**	**(130-515)**
Manual mA	**440.0**	**320.0**	**330.0**
Noise Index	**15.1**	**17.9**	**26.6**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Series 2, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**16**	**16**	**16**
Recon Type	**Soft**	**Soft**	**Soft**
WW/WL	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**60% / 30% / High**	**60% / 30% / High**	**60% / 30% / High**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**
Recon 2 (Secondary)			
DFOV	**16**	**16**	**16**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**2500/350**	**2500/350**	**2500/350**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**	**None**	**None**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**
Recon 3 (Secondary)			
DFOV	**16**	**16**	**16**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**2500/350**	**2500/350**	**2500/350**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**	**None**	**None**
Slice Thickness (mm)	**0.625**	**0.625**	**0.625**
Interval (mm)	**0.312**	**0.312**	**0.312**

16 & 32 Slice Scanner Exceptions:

1. The 0.625mm slice thickness x 0.312mm interval Recon should be 1.25mm slice thickness x 0.625mm interval on 16 and 32 slice CT scanners. The 16 and 32 slice scanners are only able to recon down to 0.625mm slice thickness when using 10mm and/or 20mm beam collimation respectively. However, when using 20mm and/or 40mm beam collimation, they are only capable of reconstructing to 1.25mm slice thickness.
2. MARS feature is not an option.
3. IQ Enhance feature requires thin slices (1.25mm or less) with an interval of half (or less). On older scanner models, in order to enable IQ Enhance at 0.625 mm slice thickness, the interval must be set to 0.311 mm instead of 0.312 mm.

Series 3, Smart Prep

	Small	Medium	Large
mA	**40**	**40**	**40**
Monitoring Delay (sec)	**10**	**10**	**10**
Monitoring ISD (sec)	**3**	**3**	**3**
Enhancement Threshold (HU)	**50**	**50**	**50**
Diagnostic Delay	**20**	**20**	**20**

Series 3, Scan Phase

	Small	Medium	Large
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**20**	**20**	**20**
Detector Rows	**32.0**	**32.0**	**32.0**
Detector Configuration	**32x0.625**	**32x0.625**	**32x0.625**
Scan FOV	**Large Body**	**Large Body**	**Large Body**
Pitch	**0.531**	**0.531**	**0.531**
Speed (mm/rot)	**10.60**	**10.60**	**10.60**
Rotation Time (s)	**0.5**	**0.9**	**1**
kV	**120**	**140**	**140**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(180-560)**	**(130-510)**	**(130-515)**
Manual mA	**440.0**	**320.0**	**330.0**
Noise Index	**15.1**	**17.9**	**26.6**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Series 3, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**16**	**16**	**16**
Recon Type	**Soft**	**Soft**	**Soft**
WW/WL	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**60% / 30% / High**	**60% / 30% / High**	**60% / 30% / High**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**
Recon 2 (Secondary)			
DFOV	**16**	**16**	**16**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**2500/350**	**2500/350**	**2500/350**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**	**None**	**None**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**
Recon 3 (Secondary)			
DFOV	**16**	**16**	**16**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**2500/350**	**2500/350**	**2500/350**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**	**None**	**None**
Slice Thickness (mm)	**0.625**	**0.625**	**0.625**
Interval (mm)	**0.312**	**0.312**	**0.312**

16 & 32 Slice Scanner Exceptions:

1. The 0.625mm slice thickness x 0.312mm interval Recon should be 1.25mm slice thickness x 0.625mm interval on 16 and 32 slice CT scanners. The 16 and 32 slice scanners are only able to recon down to 0.625mm slice thickness when using 10mm and/or 20mm beam collimation respectively. However, when using 20mm and/or 40mm beam collimation, they are only capable of reconstructing to 1.25mm slice thickness.
2. MARS feature is not an option.
3. IQ Enhance feature requires thin slices (1.25mm or less) with an interval of half (or less). On older scanner models, in order to enable IQ Enhance at 0.625 mm slice thickness, the interval must be set to 0.311 mm instead of 0.312 mm.

Adult Cervical Spine (with Metal) 3.19/3.20/3.21

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Indication

Trauma, neck pain, cervical stenosis, radiculopathy, fracture, evaluate fixation hardware

Video for this protocol

Oral Contrast

None

Pre-Scan Instructions

- Extend the scouts to include the aortic arch for smart prep if IV contrast is to be used.
- Patient Positioning:
  - Warning: Do not flex or extend the neck if there has been recent spine trauma or if the patient is in a C-Spine trauma collar.
  - If no recent trauma, tilt the patient's head so that a line connecting the lateral canthus of the eye and the EAC is perpendicular to the CT tabletop.
  - The shoulders should be pulled down as much as possible
- Remove all metallic and high-density objects from the scanning area.
- Post T and L Spine Myelogram patients: Please remember to roll the patient 360 degrees before scanning in order to distribute the contrast evenly in the spinal canal.

IV Contrast Parameters 350

Select Ulrich protocols 22-24

Weight Ranges	Contrast Dosage	Injection Rate
<200 lbs. (<90 kg)	69 mL Iohexol 350 mgI/mL + 50 mL NaCl flush	3 mL/sec
200-300 lbs (90-136 kg)	94 mL Iohexol 350 mgI/mL + 50 mL NaCl flush	3.5 mL/sec
>300 lbs (>136 kg)	127 mL of Iohexol 350 mgI/mL + 50 mL NaCl flush	4 mL/sec
Use 103 mL Iohexol 350 mgI/mL if a CT head is to be scanned with the spine. Under smart prep, add a diagnostic delay of 15 seconds for 16 slice scanner and 20 seconds for all other scanners.		

IV Contrast Parameters 300/370

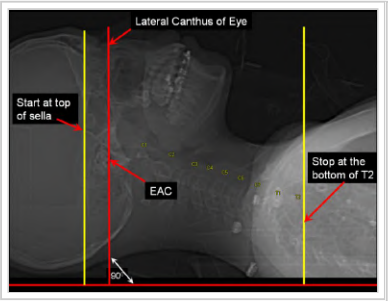
Weight Ranges	Contrast Dosage	Injection Rate
<200 lbs. (<90 kg)	80 mL Iohexol 300 mgI/mL + 50 mL NaCl flush	3 mL/sec
200-300 lbs (90-136 kg)	110 mL Iohexol 300 mgI/mL + 50 mL NaCl flush	3.5 mL/sec
>300 lbs (>136 kg)	120 mL of Iopamidol 370 mgI/mL (Isovue) + 50 mL NaCl flush	4 mL/sec
Use 120 mL if a head is scanned with the spine. Under smart prep, add a diagnostic delay of 15 seconds for 16 slice scanner and 20 seconds for all other scanners.		

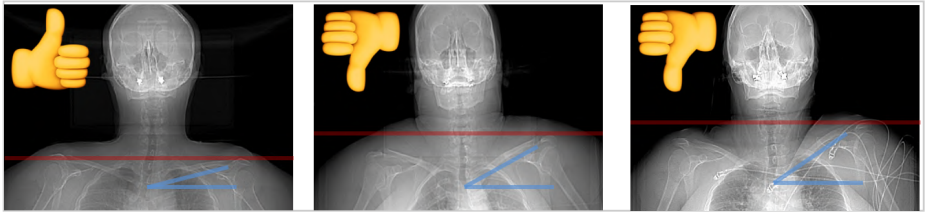
Field of View

Preferred 16cm

Scan Description

- Series 1 – Scouts PA and Lateral
- Series 2 – CT C-Spine without: Scan from the top of the sella to the bottom of T2
- Series 3 - CT C-Spine with: Scan from the top of the sella to the bottom of T2
    - Smart Prep: place ROI on the aortic arch.
        - After the arrival of contrast in aortic arch there will be a diagnostic delay: 15 sec (16 slice scanners), 20 sec (64 slice scanners)





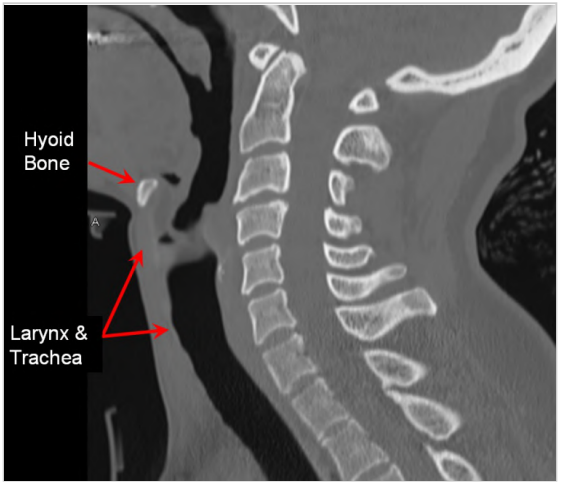
Examples of good and bad shoulder position relative to the neck. The techniques listed above can get a patient from having a poor positioning of the shoulder to a good position. Note: try to recognize improper shoulder relaxation before you scout. If, however, you only notice this after you scout, there is no need to re-scout the patient after they move their shoulders.

- Verify that the arms are outside of the CT wrap, and that the shoulders are relaxed down toward the feet as far as possible. Measure the width of the shoulders through the level of the mid-humeral head, as shown below.
- Check BMI
- Select small, medium and large based on the table below.

Measure width through mid-humeral heads	Small	Medium	Large
	Shoulder width less than 46 cm *OR* BMI less than 26	**Shoulder Width 46 to 50 cm**	**Shoulder width greater than 50 cm *OR* BMI greater than 35**

Reformat Instructions

- If the patient has a lot of metal in their teeth please use the MARS recons for the reformats. MAR is enabled on Adult protocols and Adolescent protocols (ages 7 -17 yrs.).
- If this is an exam solely With contrast or solely Without contrast: Please perform 2D-reformats using both the ST AND the THIN BONE.
- If this is a “With & Without” contrast study: Please perform 2D reformats using ST from the With contrast series and THIN BONE from Non-Contrast series.



Reformats

With or Without Contrast

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
CO ST	Thin ST	Manual	Average	450/50	3	1.5	Coronal
CO BONE	Thin Bone	Manual	Average	2500/350	1.5	0.75	Coronal
SA ST	Thin ST	Manual	Average	450/50	3	1.5	Sagittal
SA BONE	Thin Bone	Manual	Average	2500/350	1.5	0.75	Sagittal

With and Without Contrast

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
CO ST	THIN ST (with contrast phase)	Manual	Average	450/50	3	1.5	Coronal
CO BONE	THIN BONE (without contrast phase)	Manual	Average	2500/350	1.5	0.75	Coronal
SA ST	THIN ST (with contrast phase)	Manual	Average	450/50	3	1.5	Sagittal
SA BONE	THIN BONE (without contrast phase)	Manual	Average	2500/350	1.5	0.75	Sagittal

Networking

- All Images to PACS (ALI_Store). Do not send Thin Bone, these recons are made solely to build reformats from.
- If Metal is present, send THIN ST MAR and build reformats from that series.
- Note: if smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

Miscellaneous

None

Acquisition Parameters

Series 1, Scout

	Small	Medium	Large
Scout 1 kV	**140**	**140**	**140**
Scout 1 mA	**10**	**10**	**10**
Scout 1 Angle	**180**	**180**	**180**
Scout 2 kV	**140**	**140**	**140**
Scout 2 mA	**80**	**80**	**80**
Scout 2 Angle	**90**	**90**	**90**
WW/WL for Scout	**500/50**	**500/50**	**500/50**

Series 2, Scan Phase

	Small	Medium	Large
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**20**	**20**	**20**
Detector Rows	**32.0**	**32.0**	**32.0**
Detector Configuration	**32x0.625**	**32x0.625**	**32x0.625**
Scan FOV	**Large Body**	**Large Body**	**Large Body**
Pitch	**0.531**	**0.531**	**0.531**
Speed (mm/rot)	**10.60**	**10.60**	**10.60**
Rotation Time (s)	**0.6**	**1**	**1**
kV	**140**	**140**	**140**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(150-490)**	**(140-515)**	**(160-515)**
Manual mA	**380.0**	**340.0**	**400.0**
Noise Index	**11.9**	**16.4**	**24.3**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Series 2, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**16**	**16**	**16**
Recon Type	**Soft**	**Soft**	**Soft**
WW/WL	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**60% / 30% / High**	**60% / 30% / High**	**60% / 30% / High**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**
Recon 2 (Secondary)			
DFOV	**16**	**16**	**16**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**2500/350**	**2500/350**	**2500/350**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**	**None**	**None**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**
Recon 3 (Secondary)			
DFOV	**16**	**16**	**16**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**2500/350**	**2500/350**	**2500/350**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**	**None**	**None**
Slice Thickness (mm)	**0.625**	**0.625**	**0.625**
Interval (mm)	**0.312**	**0.312**	**0.312**

If Metal

	Small	Medium	Large
Recon 4 (Secondary)			
DFOV	**16**	**16**	**16**
Recon Type	**Soft**	**Soft**	**Soft**
WW/WL	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
Recon Option	**MARS On**	**MARS On**	**MARS On**
ASiR/ASiR256/DLIR	**60% / 30% / High**	**60% / 30% / High**	**60% / 30% / High**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

16 & 32 Slice Scanner Exceptions:

1. The 0.625mm slice thickness x 0.312mm interval Recon should be 1.25mm slice thickness x 0.625mm interval on 16 and 32 slice CT scanners. The 16 and 32 slice scanners are only able to recon down to 0.625mm slice thickness when using 10mm and/or 20mm beam collimation respectively. However, when using 20mm and/or 40mm beam collimation, they are only capable of reconstructing to 1.25mm slice thickness.
2. MARS feature is not an option.
3. IQ Enhance feature requires thin slices (1.25mm or less) with an interval of half (or less). On older scanner models, in order to enable IQ Enhance at 0.625 mm slice thickness, the interval must be set to 0.311 mm instead of 0.312 mm.

DLIR Limitations:

1. DLIR is not available on the Primary Recon.
2. DLIR is only compatible with the Standard Algorithm. So, in instances where the primary recon is Soft algorithm,(i.e. many Neuro Protocols) the subsequent recons will be in Standard Algorithm to enable DLIR. The slight difference between the Soft and Standard Algorithms is outweighed by the improvement in image quality with DLIR enabled.
3. DLIR requires an interval exactly half of the slice thickness.
4. DLIR doesn't allow an interval of 0.312 mm. So, if you are on a DLIR enabled scanner, the thin 0.625 recon will be at 0.625x0.625 mm. On all other scanners the thin recon will be at 0.625x0.312 mm.

Series 3, Smart Prep

	Small	Medium	Large
mA	**40**	**40**	**40**
Monitoring Delay (sec)	**10**	**10**	**10**
Monitoring ISD (sec)	**3**	**3**	**3**
Enhancement Threshold (HU)	**50**	**50**	**50**
Diagnostic Delay	**20**	**20**	**20**

Series 3, Scan Phase

	Small	Medium	Large
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**20**	**20**	**20**
Detector Rows	**32.0**	**32.0**	**32.0**
Detector Configuration	**32x0.625**	**32x0.625**	**32x0.625**
Scan FOV	**Large Body**	**Large Body**	**Large Body**
Pitch	**0.531**	**0.531**	**0.531**
Speed (mm/rot)	**10.60**	**10.60**	**10.60**
Rotation Time (s)	**0.6**	**1**	**1**
kV	**140**	**140**	**140**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(150-490)**	**(140-515)**	**(160-515)**
Manual mA	**380.0**	**340.0**	**400.0**
Noise Index	**11.9**	**16.4**	**24.3**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Series 3, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**16**	**16**	**16**
Recon Type	**Soft**	**Soft**	**Soft**
WW/WL	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**60% / 30% / High**	**60% / 30% / High**	**60% / 30% / High**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**
Recon 2 (Secondary)			
DFOV	**16**	**16**	**16**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**2500/350**	**2500/350**	**2500/350**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**	**None**	**None**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**
Recon 3 (Secondary)			
DFOV	**16**	**16**	**16**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**2500/350**	**2500/350**	**2500/350**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**	**None**	**None**
Slice Thickness (mm)	**0.625**	**0.625**	**0.625**
Interval (mm)	**0.312**	**0.312**	**0.312**

If Metal

	Small	Medium	Large
Recon 4 (Secondary)			
DFOV	**16**	**16**	**16**
Recon Type	**Soft**	**Soft**	**Soft**
WW/WL	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
Recon Option	**MARS On**	**MARS On**	**MARS On**
ASiR/ASiR256/DLIR	**60% / 30% / High**	**60% / 30% / High**	**60% / 30% / High**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

16 & 32 Slice Scanner Exceptions:

1. The 0.625mm slice thickness x 0.312mm interval Recon should be 1.25mm slice thickness x 0.625mm interval on 16 and 32 slice CT scanners. The 16 and 32 slice scanners are only able to recon down to 0.625mm slice thickness when using 10mm and/or 20mm beam collimation respectively. However, when using 20mm and/or 40mm beam collimation, they are only capable of reconstructing to 1.25mm slice thickness.
2. MARS feature is not an option.
3. IQ Enhance feature requires thin slices (1.25mm or less) with an interval of half (or less). On older scanner models, in order to enable IQ Enhance at 0.625 mm slice thickness, the interval must be set to 0.311 mm instead of 0.312 mm.

Adult Lumbar Spine (without Metal) 7.1/7.2/7.3

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Indication

Trauma, neck pain, lumbar stenosis, radiculopathy, fracture, evaluate fixation hardware

Oral Contrast

None

Pre-Scan Instructions

- Extend the scouts to include the aortic arch for smart prep if IV contrast is to be used.
- Remove all metallic and high-density objects from the scanning area.
- Scan from the top of T12 to the top of S2
- Post myelography patients: Please remember to roll the patient 360 degrees before scanning to distribute the contrast evenly in the spinal canal.
- **Only if both CT T and L Spines are ordered**
  - Please start scanning T and L Spines together (scanning acquisition parameters are identical so we will be saving the patients some radiation dose due to avoiding any overlap).
  - Do separate coronal and sagittal reformats and send to PACS as 2 different exams using exam split.
  - Axial images of the entire Spine (T and L) should be sent to both T and L Spine exams. Sagittal and coronal reformats for the T-Spine should go from C7 to L1, and the sag and cor reformats from the L-Spine go from T12 to S2.
  - Also include the entire T/L Spine sagittal reformat. Do not include a coronal reformat of the entire T/L Spine.

IV Contrast Parameters 350

Select Ulrich protocols 22-24

Weight Ranges	Contrast Dosage	Injection Rate
<200 lbs. (<90 kg)	69 ml Iohexol 350 mgI/mL + 50 mL NaCl flush	3 mL/sec
200-300 lbs (90-136 kg)	94 mL Iohexol 350 mgI/mL + 50 mL NaCl flush	3.5 mL/sec
>300 lbs (>136 kg)	127 mL Iohexol 350 mgI/mL + 50 mL NaCl flush	4 mL/sec
Use a minimum of 103 mL Iohexol 350 mgI/mL if a CT Head is to be scanned with the spine. Under smart prep, add a diagnostic delay of 15 seconds for 16 slice scanner and 20 seconds for all other scanners.		

IV Contrast Parameters 300/370

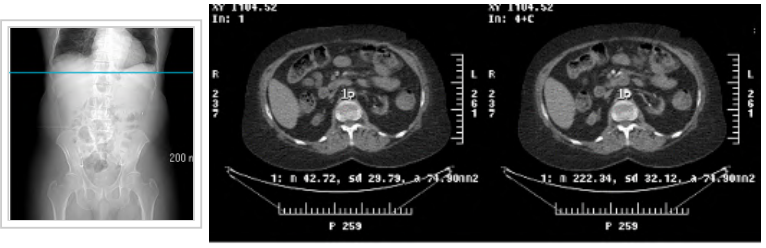
Weight Ranges	Contrast Dosage	Injection Rate
<200 lbs. (<90 kg)	80 ml Iohexol 300 mgI/mL + 50 mL NaCl flush	3 mL/sec
200-300 lbs (90-136 kg)	110 mL Iohexol 300 mgI/mL + 50 mL NaCl flush	3.5 mL/sec
>300 lbs (>136 kg)	120 mL Iopamidol 370 mgI/mL (Isovue) + 50 mL NaCl flush	4 mL/sec
Use 120 ml if a head is scanned with the spine. Under smart prep, add a diagnostic delay of 15 seconds for 16 slice scanner and 20 seconds for all other scanners.		

Field of View

Preferred 16cm

Scan Description

- Series 1 – Scouts PA and Lateral
- Series 2 – CT L-Spine without: Scan from the top of T12 to the top of S2
- Series 3 - CT L-Spine with: Scan from the top of T12 to the top of S2
  - Smart Prep Place ROI on the abdominal aorta
    - After the arrival of contrast in the abdominal aorta there will be a diagnostic delay: 15 sec (16 slice scanners), 20 sec (64 slice scanners)



Reformat Instructions

- Do not send the 0.625 mm bone images (Recon 2) to PACS
- Do 2 x 1 mm coronal and sagittal 2D-reformats.
- If exam is solely with contrast or solely without contrast: Do 2D-reformats using both the standard 1.25 mm images (Recon 1) AND the bone 0.625 mm images (Recon 2)
- If this is a “with & without” contrast study: Do not do Recons 2 and 3 on the non-contrast part
- If this is a “with & without” contrast study: Do 2D-reformats only from the contrast portion of the study using standard 1.25 mm images (Recon 1) AND bone 0.625 mm images (Recon 2)

Reformats

With or Without Contrast

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
CO ST	Thin ST	Manual	Average	450/50	2	1	Coronal
CO BONE	Thin Bone	Manual	Average	2500/350	2	1	Coronal
SA ST	Thin ST	Manual	Average	450/50	2	1	Sagittal
SA BONE	Thin Bone	Manual	Average	2500/350	2	1	Sagittal

With and Without Contrast

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
CO ST	THIN ST (with contrast phase)	Manual	Average	450/50	2	1	Coronal
CO BONE	THIN BONE (with contrast phase)	Manual	Average	2500/350	2	1	Coronal
SA ST	THIN ST (with contrast phase)	Manual	Average	450/50	2	1	Sagittal
SA BONE	THIN BONE (with contrast phase)	Manual	Average	2500/350	2	1	Sagittal

Networking

- All Images to PACS (ALI_Store). Do not send Thin Bone, these recons are made solely to build reformats from.
- If Metal is present, send THIN ST MAR and build reformats from that series.
- Note: if smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

All MAR recons and reformats should be sent to PACS (ALI_Store). Label MAR reformats with the word "MAR" at the end, for example "CO ST MAR".

Miscellaneous

None

Acquisition Parameters

Series 1, Scout

	Small	Medium	Large
Scout 1 kV	**100**	**120**	**140**
Scout 1 mA	**10**	**10**	**10**
Scout 1 Angle	**180**	**180**	**180**
Scout 2 kV	**100**	**120**	**140**
Scout 2 mA	**40**	**40**	**80**
Scout 2 Angle	**90**	**90**	**90**
WW/WL for Scout	**500/50**	**500/50**	**500/50**

Series 2, Scan Phase

	Small	Medium	Large
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**40**	**40**	**40**
Detector Rows	**64.0**	**64.0**	**64.0**
Detector Configuration	**64x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Large Body**	**Large Body**	**Large Body**
Pitch	**0.516**	**0.516**	**0.516**
Speed (mm/rot)	**20.60**	**20.60**	**20.60**
Rotation Time (s)	**0.6**	**0.8**	**1**
kV	**100**	**120**	**140**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(60-470)**	**(50-530)**	**(45-500)**
Manual mA	**300.0**	**270.0**	**280.0**
Noise Index	**18.0**	**21.0**	**26.5**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Series 2, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**16**	**16**	**16**
Recon Type	**Soft**	**Soft**	**Soft**
WW/WL	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**60% / 30% / High**	**60% / 30% / High**	**60% / 30% / High**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**
Recon 2 (Secondary)			
DFOV	**16**	**16**	**16**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**2500/350**	**2500/350**	**2500/350**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**	**None**	**None**
Slice Thickness (mm)	**0.625**	**0.625**	**0.625**
Interval (mm)	**0.312**	**0.312**	**0.312**
Recon 3 (Secondary)			
DFOV	**16**	**16**	**16**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**2500/350**	**2500/350**	**2500/350**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**	**None**	**None**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

16 & 32 Slice Scanner Exceptions:

1. The 0.625mm slice thickness x 0.312mm interval Recon should be 1.25mm slice thickness x 0.625mm interval on 16 and 32 slice CT scanners. The 16 and 32 slice scanners are only able to recon down to 0.625mm slice thickness when using 10mm and/or 20mm beam collimation respectively. However, when using 20mm and/or 40mm beam collimation, they are only capable of reconstructing to 1.25mm slice thickness.
2. MARS feature is not an option.
3. IQ Enhance feature requires thin slices (1.25mm or less) with an interval of half (or less). On older scanner models, in order to enable IQ Enhance at 0.625 mm slice thickness, the interval must be set to 0.311 mm instead of 0.312 mm.

DLIR Limitations:

1. DLIR is not available on the Primary Recon.
2. DLIR is only compatible with the Standard Algorithm. So, in instances where the primary recon is Soft algorithm,(i.e. many Neuro Protocols) the subsequent recons will be in Standard Algorithm to enable DLIR. The slight difference between the Soft and Standard Algorithms is outweighed by the improvement in image quality with DLIR enabled.
3. DLIR requires an interval exactly half of the slice thickness.
4. DLIR doesn't allow an interval of 0.312 mm. So, if you are on a DLIR enabled scanner, the thin 0.625 recon will be at 0.625x0.625 mm. On all other scanners the thin recon will be at 0.625x0.312 mm.

Series 3, Smart Prep

	Small	Medium	Large
mA	**40**	**40**	**40**
Monitoring Delay (sec)	**15**	**15**	**15**
Monitoring ISD (sec)	**3**	**3**	**3**
Enhancement Threshold (HU)	**50**	**50**	**50**
Diagnostic Delay	**20**	**20**	**20**

Series 3, Scan Phase

	Small	Medium	Large
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**40**	**40**	**40**
Detector Rows	**64.0**	**64.0**	**64.0**
Detector Configuration	**64x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Large Body**	**Large Body**	**Large Body**
Pitch	**0.516**	**0.516**	**0.516**
Speed (mm/rot)	**20.60**	**20.60**	**20.60**
Rotation Time (s)	**0.6**	**0.8**	**1**
kV	**100**	**120**	**140**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(60-470)**	**(50-530)**	**(45-500)**
Manual mA	**300.0**	**270.0**	**280.0**
Noise Index	**18.0**	**21.0**	**26.5**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Series 3, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**16**	**16**	**16**
Recon Type	**Soft**	**Soft**	**Soft**
WW/WL	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**60% / 30% / High**	**60% / 30% / High**	**60% / 30% / High**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**
Recon 2 (Secondary)			
DFOV	**16**	**16**	**16**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**2500/350**	**2500/350**	**2500/350**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**	**None**	**None**
Slice Thickness (mm)	**0.625**	**0.625**	**0.625**
Interval (mm)	**0.312**	**0.312**	**0.312**
Recon 3 (Secondary)			
DFOV	**16**	**16**	**16**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**2500/350**	**2500/350**	**2500/350**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**	**None**	**None**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

16 & 32 Slice Scanner Exceptions:

1. The 0.625mm slice thickness x 0.312mm interval Recon should be 1.25mm slice thickness x 0.625mm interval on 16 and 32 slice CT scanners. The 16 and 32 slice scanners are only able to recon down to 0.625mm slice thickness when using 10mm and/or 20mm beam collimation respectively. However, when using 20mm and/or 40mm beam collimation, they are only capable of reconstructing to 1.25mm slice thickness.
2. MARS feature is not an option.
3. IQ Enhance feature requires thin slices (1.25mm or less) with an interval of half (or less). On older scanner models, in order to enable IQ Enhance at 0.625 mm slice thickness, the interval must be set to 0.311 mm instead of 0.312 mm.

Adult Thoracic Spine (without Metal) 7.4/7.5/7.6

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Indication

Trauma, thoracic pain, thoracic stenosis, radiculopathy, fracture, evaluate fixation hardware

Oral Contrast

None

Pre-Scan Instructions

- Extend the scouts to include the aortic arch for smart prep if IV contrast is to be used.
- Remove all metallic and high-density objects from the scanning area including the patients arms. If the patient is unable to raise their arms above their head, please use the "pillow trick":

- Post myelography patients: Please remember to roll the patient 360 degrees before scanning to distribute the contrast evenly in the spinal canal.
- **Only if both CT T and L spines are ordered**
  - Please start scanning T and L spines together (scanning acquisition parameters are identical so we will be saving the patients some radiation dose due to avoiding any overlap).
  - Do separate coronal and sagittal reformats and send to PACS as 2 different exams using exam split.
  - Axial images of the entire Spine (T and L) should be sent to both T and L Spine exams. Sagittal and coronal reformats for the T-Spine should go from C7 to L1, and the sag and cor reformats from the L-Spine go from T12 to S2.
  - Also include the entire T/L Spine sagittal reformat. Do not include a coronal reformat of the entire T/L Spine.

IV Contrast Parameters 350

Select Ulrich protocols 22-24

Weight Ranges	Contrast Dosage	Injection Rate
<200 lbs. (<90 kg)	69 mL Iohexol 350 mgI/mL + 50 mL NaCl flush	3 mL/sec
200-300 lbs (90-136 kg)	94 mL Iohexol 350 mgI/mL + 50 mL NaCl flush	3.5 mL/sec
>300 lbs (>136 kg)	127 mL Iohexol 350 mgI/mL + 50 mL NaCl flush	4 mL/sec
Use 103 mL Iohexol 350 mgI/mL if a CT head is to be scanned with the spine. Under smart prep, add a diagnostic delay of 15 seconds for 16 slice scanner and 20 seconds for all other scanners.		

IV Contrast Parameters 300/370

Weight Ranges	Contrast Dosage	Injection Rate
<200 lbs. (<90 kg)	80 mL Iohexol 300 mgI/mL + 50 mL NaCl flush	3 mL/sec
200-300 lbs (90-136 kg)	110 mL Iohexol 300 mgI/mL + 50 mL NaCl flush	3.5 mL/sec
>300 lbs (>136 kg)	120 mL Iohexol 300 mgI/mL + 50 mL NaCl flush	4 mL/sec
Use 120 mL if a head is scanned with the spine. Under smart prep, add a diagnostic delay of 15 seconds for 16 slice scanner and 20 seconds for all other scanners.		

Field of View

Preferred 16cm

Scan Description

- Series 1 – Scouts PA and Lateral
- Series 2 – CT T-Spine without: Scan from the top of C7 to the bottom of L1
- Series 3 - CT T-spine with: Scan from the top of C7 to the bottom of L1
  - Smart Prep: Place ROI on the aortic arch.
    - After the arrival of contrast in aortic arch there will be a diagnostic delay: 15 sec (16 slice scanners), 20 sec (64 slice scanners)

Reformat Instructions

- Do not send the 0.625 mm bone images (Recon 2) to PACS
- Do 2 x 1 mm coronal and sagittal 2D-reformats.
- If exam is solely with contrast or solely without contrast: Do 2D-reformats using both the standard 1.25 mm images (Recon 1) AND the bone 0.625 mm images (Recon 2)
- If this is a “with & without” contrast study: Do not do Recons 2 and 3 on the non-contrast part
- If this is a “with & without” contrast study: Do 2D-reformats only from the contrast portion of the study using standard 1.25 mm images (Recon 1) AND bone 0.625 mm images (Recon 2)

Reformats

With or Without Contrast

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
CO ST	Thin ST	Manual	Average	450/50	2	1	Coronal
CO BONE	Thin Bone	Manual	Average	2500/350	2	1	Coronal
SA ST	Thin ST	Manual	Average	450/50	2	1	Sagittal
SA BONE	Thin Bone	Manual	Average	2500/350	2	1	Sagittal

With and Without Contrast

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
CO ST	THIN ST (with contrast phase)	Manual	Average	450/50	2	1	Coronal
CO BONE	THIN BONE (with contrast phase)	Manual	Average	2500/350	2	1	Coronal
SA ST	THIN ST (with contrast phase)	Manual	Average	450/50	2	1	Sagittal
SA BONE	THIN BONE (with contrast phase)	Manual	Average	2500/350	2	1	Sagittal

Networking

- All Images to PACS (ALI_Store). Do not send Thin Bone, these recons are made solely to build reformats from.
- If Metal is present, send THIN ST MAR and build reformats from that series.
- Note: if smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

All MAR recons and reformats should be sent to PACS (ALI_Store). Label MAR reformats with the word "MAR" at the end, for example "CO ST MAR".

Miscellaneous

None

Acquisition Parameters

Series 1, Scout

	Small	Medium	Large
Scout 1 kV	100	120	140
Scout 1 mA	10	10	10
Scout 1 Angle	180	180	180
Scout 2 kV	100	120	140
Scout 2 mA	40	40	80
Scout 2 Angle	90	90	90
WW/WL for Scout	500/50	500/50	500/50

Series 2, Scan Phase

	Small	Medium	Large
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**40**	**40**	**40**
Detector Rows	**64.0**	**64.0**	**64.0**
Detector Configuration	**64x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Large Body**	**Large Body**	**Large Body**
Pitch	**0.516**	**0.516**	**0.516**
Speed (mm/rot)	**20.60**	**20.60**	**20.60**
Rotation Time (s)	**0.6**	**0.8**	**1**
kV	**100**	**120**	**140**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(60-470)**	**(50-530)**	**(45-500)**
Manual mA	**300.0**	**270.0**	**280.0**
Noise Index	**18.0**	**21.0**	**26.5**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Series 2, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**16**	**16**	**16**
Recon Type	**Soft**	**Soft**	**Soft**
WW/WL	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**60% / 30% / High**	**60% / 30% / High**	**60% / 30% / High**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**
Recon 2 (Secondary)			
DFOV	**16**	**16**	**16**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**2500/350**	**2500/350**	**2500/350**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**	**None**	**None**
Slice Thickness (mm)	**0.625**	**0.625**	**0.625**
Interval (mm)	**0.312**	**0.312**	**0.312**
Recon 3 (Secondary)			
DFOV	**16**	**16**	**16**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**2500/350**	**2500/350**	**2500/350**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**	**None**	**None**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

16 & 32 Slice Scanner Exceptions:

1. The 0.625mm slice thickness x 0.312mm interval Recon should be 1.25mm slice thickness x 0.625mm interval on 16 and 32 slice CT scanners. The 16 and 32 slice scanners are only able to recon down to 0.625mm slice thickness when using 10mm and/or 20mm beam collimation respectively. However, when using 20mm and/or 40mm beam collimation, they are only capable of reconstructing to 1.25mm slice thickness.
2. MARS feature is not an option.
3. IQ Enhance feature requires thin slices (1.25mm or less) with an interval of half (or less). On older scanner models, in order to enable IQ Enhance at 0.625 mm slice thickness, the interval must be set to 0.311 mm instead of 0.312 mm.

DLIR Limitations:

1. DLIR is not available on the Primary Recon.
2. DLIR is only compatible with the Standard Algorithm. So, in instances where the primary recon is Soft algorithm,(i.e. many Neuro Protocols) the subsequent recons will be in Standard Algorithm to enable DLIR. The slight difference between the Soft and Standard Algorithms is outweighed by the improvement in image quality with DLIR enabled.
3. DLIR requires an interval exactly half of the slice thickness.
4. DLIR doesn't allow an interval of 0.312 mm. So, if you are on a DLIR enabled scanner, the thin 0.625 recon will be at 0.625x0.625 mm. On all other scanners the thin recon will be at 0.625x0.312 mm.

Series 3, Smart Prep

	Small	Medium	Large
mA	**40**	**40**	**40**
Monitoring Delay (sec)	**15**	**15**	**15**
Monitoring ISD (sec)	**3**	**3**	**3**
Enhancement Threshold (HU)	**50**	**50**	**50**
Diagnostic Delay	**20**	**20**	**20**

Series 3, Scan Phase

	Small	Medium	Large
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**40**	**40**	**40**
Detector Rows	**64.0**	**64.0**	**64.0**
Detector Configuration	**64x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Large Body**	**Large Body**	**Large Body**
Pitch	**0.516**	**0.516**	**0.516**
Speed (mm/rot)	**20.60**	**20.60**	**20.60**
Rotation Time (s)	**0.6**	**0.8**	**1**
kV	**100**	**120**	**140**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(60-470)**	**(50-530)**	**(45-500)**
Manual mA	**300.0**	**270.0**	**280.0**
Noise Index	**18.0**	**21.0**	**26.5**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Series 2, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**16**	**16**	**16**
Recon Type	**Soft**	**Soft**	**Soft**
WW/WL	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**60% / 30% / High**	**60% / 30% / High**	**60% / 30% / High**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**
Recon 2 (Secondary)			
DFOV	**16**	**16**	**16**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**2500/350**	**2500/350**	**2500/350**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**	**None**	**None**
Slice Thickness (mm)	**0.625**	**0.625**	**0.625**
Interval (mm)	**0.312**	**0.312**	**0.312**
Recon 3 (Secondary)			
DFOV	**16**	**16**	**16**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**2500/350**	**2500/350**	**2500/350**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**	**None**	**None**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

16 & 32 Slice Scanner Exceptions:

1. The 0.625mm slice thickness x 0.312mm interval Recon should be 1.25mm slice thickness x 0.625mm interval on 16 and 32 slice CT scanners. The 16 and 32 slice scanners are only able to recon down to 0.625mm slice thickness when using 10mm and/or 20mm beam collimation respectively. However, when using 20mm and/or 40mm beam collimation, they are only capable of reconstructing to 1.25mm slice thickness.
2. MARS feature is not an option.
3. IQ Enhance feature requires thin slices (1.25mm or less) with an interval of half (or less). On older scanner models, in order to enable IQ Enhance at 0.625 mm slice thickness, the interval must be set to 0.311 mm instead of 0.312 mm.

Adult Lumbar Spine (with Metal) 7.10/7.11/7.12

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Indication

Trauma, neck pain, lumbar stenosis, radiculopathy, fracture, evaluate fixation hardware

Oral Contrast

None

Pre-Scan Instructions

- Extend the scouts to include the aortic arch for smart prep if IV contrast is to be used.
- Remove all metallic and high-density objects from the scanning area.
- Scan from the top of T12 to the top of S2
- Post myelography patients: Please remember to roll the patient 360 degrees before scanning to distribute the contrast evenly in the spinal canal.
- **Only if both CT T and L Spines are ordered**
  - Please start scanning T and L Spines together (scanning acquisition parameters are identical so we will be saving the patients some radiation dose due to avoiding any overlap).
  - Do separate coronal and sagittal reformats and send to PACS as 2 different exams using exam split.
  - Axial images of the entire Spine (T and L) should be sent to both T and L Spine exams. Sagittal and coronal reformats for the T-Spine should go from C7 to L1, and the sag and cor reformats from the L-Spine go from T12 to S2.
  - Also include the entire T/L Spine sagittal reformat. Do not include a coronal reformat of the entire T/L Spine.

IV Contrast Parameters 350

Select Ulrich protocols 22-24

Weight Ranges	Contrast Dosage	Injection Rate
<200 lbs. (<90 kg)	69 ml Iohexol 350 mgI/mL + 50 mL NaCl flush	3 mL/sec
200-300 lbs (90-136 kg)	94 mL Iohexol 350 mgI/mL + 50 mL NaCl flush	3.5 mL/sec
>300 lbs (>136 kg)	127 mL Iohexol 350 mgI/mL + 50 mL NaCl flush	4 mL/sec
Use a minimum of 103 mL Iohexol 350 mgI/mL if a CT Head is to be scanned with the spine. Under smart prep, add a diagnostic delay of 15 seconds for 16 slice scanner and 20 seconds for all other scanners.		

IV Contrast Parameters 300/370

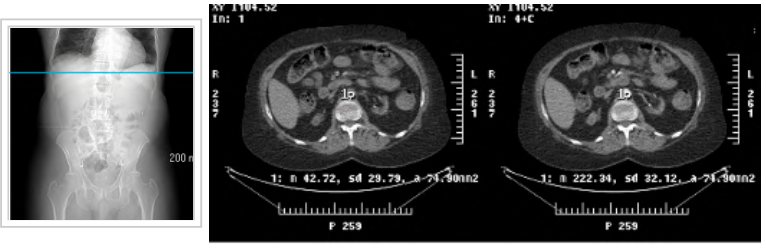
Weight Ranges	Contrast Dosage	Injection Rate
<200 lbs. (<90 kg)	80 ml Iohexol 300 mgI/mL + 50 mL NaCl flush	3 mL/sec
200-300 lbs (90-136 kg)	110 mL Iohexol 300 mgI/mL + 50 mL NaCl flush	3.5 mL/sec
>300 lbs (>136 kg)	120 mL Iopamidol 370 mgI/mL (Isovue) + 50 mL NaCl flush	4 mL/sec
Use 120 ml if a head is scanned with the spine. Under smart prep, add a diagnostic delay of 15 seconds for 16 slice scanner and 20 seconds for all other scanners.		

Field of View

Preferred 16cm

Scan Description

- Series 1 – Scouts PA and Lateral
- Series 2 – CT L-Spine without: Scan from the top of T12 to the top of S2
- Series 3 - CT L-Spine with: Scan from the top of T12 to the top of S2
  - Smart Prep Place ROI on the abdominal aorta
    - After the arrival of contrast in the abdominal aorta there will be a diagnostic delay: 15 sec (16 slice scanners), 20 sec (64 slice scanners)



Reformat Instructions

- Do not send the 0.625 mm bone images (Recon 2) to PACS
- Do 2 x 1 mm coronal and sagittal 2D-reformats.
- If exam is solely with contrast or solely without contrast: Do 2D-reformats using both the standard 1.25 mm images (Recon 1) AND the bone 0.625 mm images (Recon 2)
- If this is a “with & without” contrast study: Do not do Recons 2 and 3 on the non-contrast part
- If this is a “with & without” contrast study: Do 2D-reformats only from the contrast portion of the study using standard 1.25 mm images (Recon 1) AND bone 0.625 mm images (Recon 2)

Reformats

With or Without Contrast

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
CO ST	Thin ST	Manual	Average	450/50	2	1	Coronal
CO BONE	Thin Bone	Manual	Average	2500/350	2	1	Coronal
SA ST	Thin ST	Manual	Average	450/50	2	1	Sagittal
SA BONE	Thin Bone	Manual	Average	2500/350	2	1	Sagittal

With and Without Contrast

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
CO ST	THIN ST (with contrast phase)	Manual	Average	450/50	2	1	Coronal
CO BONE	THIN BONE (with contrast phase)	Manual	Average	2500/350	2	1	Coronal
SA ST	THIN ST (with contrast phase)	Manual	Average	450/50	2	1	Sagittal
SA BONE	THIN BONE (with contrast phase)	Manual	Average	2500/350	2	1	Sagittal

Networking

- All Images to PACS (ALI_Store). Do not send Thin Bone, these recons are made solely to build reformats from.
- If Metal is present, send THIN ST MAR and build reformats from that series.
- Note: if smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

All MAR recons and reformats should be sent to PACS (ALI_Store). Label MAR reformats with the word "MAR" at the end, for example "CO ST MAR".

Miscellaneous

None

Acquisition Parameters

Series 1, Scout

	Small	Medium	Large
Scout 1 kV	**140**	**140**	**140**
Scout 1 mA	**10**	**10**	**10**
Scout 1 Angle	**180**	**180**	**180**
Scout 2 kV	**140**	**140**	**140**
Scout 2 mA	**80**	**80**	**80**
Scout 2 Angle	**90**	**90**	**90**
WW/WL for Scout	**500/50**	**500/50**	**500/50**

Series 2, Scan Phase

	Small	Medium	Large
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**40**	**40**	**40**
Detector Rows	**64.0**	**64.0**	**64.0**
Detector Configuration	**64x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Large Body**	**Large Body**	**Large Body**
Pitch	**0.516**	**0.516**	**0.516**
Speed (mm/rot)	**20.60**	**20.60**	**20.60**
Rotation Time (s)	**0.5**	**0.9**	**1**
kV	**140**	**140**	**140**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(60-480)**	**(50-490)**	**(50-515)**
Manual mA	**300.0**	**250.0**	**340.0**
Noise Index	**12.0**	**16.5**	**24.5**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Series 2, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**16**	**16**	**16**
Recon Type	**Soft**	**Soft**	**Soft**
WW/WL	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**60% / 30% / High**	**60% / 30% / High**	**60% / 30% / High**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**
Recon 2 (Secondary)			
DFOV	**16**	**16**	**16**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**2500/350**	**2500/350**	**2500/350**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**	**None**	**None**
Slice Thickness (mm)	**0.625**	**0.625**	**0.625**
Interval (mm)	**0.312**	**0.312**	**0.312**
Recon 3 (Secondary)			
DFOV	**16**	**16**	**16**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**2500/350**	**2500/350**	**2500/350**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**	**None**	**None**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

If Metal

	Small	Medium	Large
Recon 4 (Secondary)			
DFOV	**16**	**16**	**16**
Recon Type	**Soft**	**Soft**	**Soft**
WW/WL	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
Recon Option	**MARS On**	**MARS On**	**MARS On**
ASiR/ASiR256/DLIR	**60% / 30% / High**	**60% / 30% / High**	**60% / 30% / High**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

16 & 32 Slice Scanner Exceptions:

1. The 0.625mm slice thickness x 0.312mm interval Recon should be 1.25mm slice thickness x 0.625mm interval on 16 and 32 slice CT scanners. The 16 and 32 slice scanners are only able to recon down to 0.625mm slice thickness when using 10mm and/or 20mm beam collimation respectively. However, when using 20mm and/or 40mm beam collimation, they are only capable of reconstructing to 1.25mm slice thickness.
2. MARS feature is not an option.
3. IQ Enhance feature requires thin slices (1.25mm or less) with an interval of half (or less). On older scanner models, in order to enable IQ Enhance at 0.625 mm slice thickness, the interval must be set to 0.311 mm instead of 0.312 mm.

DLIR Limitations:

1. DLIR is not available on the Primary Recon.

2. DLIR is only compatible with the Standard Algorithm. So, in instances where the primary recon is Soft algorithm,(i.e. many Neuro Protocols) the subsequent recons will be in Standard Algorithm to enable DLIR. The slight difference between the Soft and Standard Algorithms is outweighed by the improvement in image quality with DLIR enabled.
3. DLIR requires an interval exactly half of the slice thickness.
4. DLIR doesn't allow an interval of 0.312 mm. So, if you are on a DLIR enabled scanner, the thin 0.625 recon will be at 0.625x0.625 mm. On all other scanners the thin recon will be at 0.625x0.312 mm.

Series 3, Smart Prep

	Small	Medium	Large
mA	**40**	**40**	**40**
Monitoring Delay (sec)	**15**	**15**	**15**
Monitoring ISD (sec)	**3**	**3**	**3**
Enhancement Threshold (HU)	**50**	**50**	**50**
Diagnostic Delay	**20**	**20**	**20**

Series 3, Scan Phase

	Small	Medium	Large
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**40**	**40**	**40**
Detector Rows	**64.0**	**64.0**	**64.0**
Detector Configuration	**64x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Large Body**	**Large Body**	**Large Body**
Pitch	**0.516**	**0.516**	**0.516**
Speed (mm/rot)	**20.60**	**20.60**	**20.60**
Rotation Time (s)	**0.5**	**0.9**	**1**
kV	**140**	**140**	**140**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(60-480)**	**(50-490)**	**(50-515)**
Manual mA	**300.0**	**250.0**	**340.0**
Noise Index	**12.0**	**16.5**	**24.5**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Series 3, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**16**	**16**	**16**
Recon Type	**Soft**	**Soft**	**Soft**
WW/WL	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**60% / 30% / High**	**60% / 30% / High**	**60% / 30% / High**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**
Recon 2 (Secondary)			
DFOV	**16**	**16**	**16**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**2500/350**	**2500/350**	**2500/350**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**	**None**	**None**
Slice Thickness (mm)	**0.625**	**0.625**	**0.625**
Interval (mm)	**0.312**	**0.312**	**0.312**
Recon 3 (Secondary)			
DFOV	**16**	**16**	**16**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**2500/350**	**2500/350**	**2500/350**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**	**None**	**None**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

If Metal

	Small	Medium	Large
Recon 4 (Secondary)			
DFOV	**16**	**16**	**16**
Recon Type	**Soft**	**Soft**	**Soft**
WW/WL	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
Recon Option	**MARS On**	**MARS On**	**MARS On**
ASiR/ASiR256/DLIR	**60% / 30% / High**	**60% / 30% / High**	**60% / 30% / High**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

16 & 32 Slice Scanner Exceptions:

1. The 0.625mm slice thickness x 0.312mm interval Recon should be 1.25mm slice thickness x 0.625mm interval on 16 and 32 slice CT scanners. The 16 and 32 slice scanners are only able to recon down to 0.625mm slice thickness when using 10mm and/or 20mm beam collimation respectively. However, when using 20mm and/or 40mm beam collimation, they are only capable of reconstructing to 1.25mm slice thickness.
2. MARS feature is not an option.
3. IQ Enhance feature requires thin slices (1.25mm or less) with an interval of half (or less). On older scanner models, in order to enable IQ Enhance at 0.625 mm slice thickness, the interval must be set to 0.311 mm instead of 0.312 mm.

Adult Thoracic Spine (with Metal) 7.13/7.14/7.15

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Indication

Trauma, thoracic pain, thoracic stenosis, radiculopathy, fracture, evaluate fixation hardware

Oral Contrast

None

Pre-Scan Instructions

- Extend the scouts to include the aortic arch for smart prep if IV contrast is to be used.
- Remove all metallic and high-density objects from the scanning area including the patients arms. If the patient is unable to raise their arms above their head, please use the "pillow trick":

- Post myelography patients: Please remember to roll the patient 360 degrees before scanning to distribute the contrast evenly in the spinal canal.
- **Only if both CT T and L spines are ordered**
  - Please start scanning T and L spines together (scanning acquisition parameters are identical so we will be saving the patients some radiation dose due to avoiding any overlap).
  - Do separate coronal and sagittal reformats and send to PACS as 2 different exams using exam split.
  - Axial images of the entire Spine (T and L) should be sent to both T and L Spine exams. Sagittal and coronal reformats for the T-Spine should go from C7 to L1, and the sag and cor reformats from the L-Spine go from T12 to S2.
  - Also include the entire T/L Spine sagittal reformat. Do not include a coronal reformat of the entire T/L Spine.

IV Contrast Parameters

Weight Ranges	Contrast Dosage	Injection Rate
<200 lbs. (<90 kg)	80 mL Iohexol 300 mgI/mL + 50 mL NaCl flush	3 mL/sec
200-300 lbs (90-136 kg)	110 mL Iohexol 300 mgI/mL + 50 mL NaCl flush	3.5 mL/sec
>300 lbs (>136 kg)	120 mL Iohexol 300 mgI/mL + 50 mL NaCl flush	4 mL/sec
Use 120 mL if a head is scanned with the spine. Under smart prep, add a diagnostic delay of 15 seconds for 16 slice scanner and 20 seconds for all other scanners.		

Field of View

Preferred 16cm

Scan Description

- Series 1 – Scouts PA and Lateral
- Series 2 – CT T-Spine without: Scan from the top of C7 to the bottom of L1
- Series 3 - CT T-spine with: Scan from the top of C7 to the bottom of L1
  - Smart Prep: Place ROI on the aortic arch.
    - After the arrival of contrast in aortic arch there will be a diagnostic delay: 15 sec (16 slice scanners), 20 sec (64 slice scanners)

Reformat Instructions

- Do not send the 0.625 mm bone images (Recon 2) to PACS
- Do 2 x 1 mm coronal and sagittal 2D-reformats.
- If exam is solely with contrast or solely without contrast: Do 2D-reformats using both the standard 1.25 mm images (Recon 1) AND the bone 0.625 mm images (Recon 2)
- If this is a “with & without” contrast study: Do not do Recons 2 and 3 on the non-contrast part
- If this is a “with & without” contrast study: Do 2D-reformats only from the contrast portion of the study using standard 1.25 mm images (Recon 1) AND bone 0.625 mm images (Recon 2)

Reformats

With or Without Contrast

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
CO ST	Thin ST	Manual	Average	450/50	2	1	Coronal
CO BONE	Thin Bone	Manual	Average	2500/350	2	1	Coronal
SA ST	Thin ST	Manual	Average	450/50	2	1	Sagittal
SA BONE	Thin Bone	Manual	Average	2500/350	2	1	Sagittal

With and Without Contrast

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
CO ST	THIN ST (with contrast phase)	Manual	Average	450/50	2	1	Coronal
CO BONE	THIN BONE (with contrast phase)	Manual	Average	2500/350	2	1	Coronal
SA ST	THIN ST (with contrast phase)	Manual	Average	450/50	2	1	Sagittal
SA BONE	THIN BONE (with contrast phase)	Manual	Average	2500/350	2	1	Sagittal

Networking

- All Images to PACS (ALI_Store). Do not send Thin Bone, these recons are made solely to build reformats from.
- If Metal is present, send THIN ST MAR and build reformats from that series.
- Note: if smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

All MAR recons and reformats should be sent to PACS (ALI_Store). Label MAR reformats with the word "MAR" at the end, for example "CO ST MAR".

Miscellaneous

None

Acquisition Parameters

Series 1, Scout

	Small	Medium	Large
Scout 1 kV	140	140	140
Scout 1 mA	10	10	10
Scout 1 Angle	180	180	180
Scout 2 kV	140	140	140
Scout 2 mA	80	80	80
Scout 2 Angle	90	90	90
WW/WL for Scout	500/50	500/50	500/50

Series 2, Scan Phase

	Small	Medium	Large
Scan Type	Helical	Helical	Helical
Beam Collimation	40	40	40
Detector Rows	64.0	64.0	64.0
Detector Configuration	64x0.625	64x0.625	64x0.625
Scan FOV	Large Body	Large Body	Large Body
Pitch	0.516	0.516	0.516
Speed (mm/rot)	20.60	20.60	20.60
Rotation Time (s)	0.5	0.9	1
kV	140	140	140
AEC type	smart mA	smart mA	smart mA
mA Range	(60-480)	(50-490)	(50-515)
Manual mA	300.0	250.0	340.0
Noise Index	12.0	16.5	24.5
Slice Thickness (mm)	1.25	1.25	1.25
Interval (mm)	0.625	0.625	0.625

Series 2, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**16**	**16**	**16**
Recon Type	**Soft**	**Soft**	**Soft**
WW/WL	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**60% / 30% / High**	**60% / 30% / High**	**60% / 30% / High**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**
Recon 2 (Secondary)			
DFOV	**16**	**16**	**16**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**2500/350**	**2500/350**	**2500/350**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**	**None**	**None**
Slice Thickness (mm)	**0.625**	**0.625**	**0.625**
Interval (mm)	**0.312**	**0.312**	**0.312**
Recon 3 (Secondary)			
DFOV	**16**	**16**	**16**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**2500/350**	**2500/350**	**2500/350**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**	**None**	**None**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

If Metal

	Small	Medium	Large
Recon 4 (Secondary)			
DFOV	**16**	**16**	**16**
Recon Type	**Soft**	**Soft**	**Soft**
WW/WL	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
Recon Option	**MARS On**	**MARS On**	**MARS On**
ASiR/ASiR256/DLIR	**60% / 30% / High**	**60% / 30% / High**	**60% / 30% / High**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

16 & 32 Slice Scanner Exceptions:

1. The 0.625mm slice thickness x 0.312mm interval Recon should be 1.25mm slice thickness x 0.625mm interval on 16 and 32 slice CT scanners. The 16 and 32 slice scanners are only able to recon down to 0.625mm slice thickness when using 10mm and/or 20mm beam collimation respectively. However, when using 20mm and/or 40mm beam collimation, they are only capable of reconstructing to 1.25mm slice thickness.
2. MARS feature is not an option.
3. IQ Enhance feature requires thin slices (1.25mm or less) with an interval of half (or less). On older scanner models, in order to enable IQ Enhance at 0.625 mm slice thickness, the interval must be set to 0.311 mm instead of 0.312 mm.

DLIR Limitations:

1. DLIR is not available on the Primary Recon.

2. DLIR is only compatible with the Standard Algorithm. So, in instances where the primary recon is Soft algorithm,(i.e. many Neuro Protocols) the subsequent recons will be in Standard Algorithm to enable DLIR. The slight difference between the Soft and Standard Algorithms is outweighed by the improvement in image quality with DLIR enabled.
3. DLIR requires an interval exactly half of the slice thickness.
4. DLIR doesn't allow an interval of 0.312 mm. So, if you are on a DLIR enabled scanner, the thin 0.625 recon will be at 0.625x0.625 mm. On all other scanners the thin recon will be at 0.625x0.312 mm.

Series 3, Smart Prep

	Small	Medium	Large
mA	**40**	**40**	**40**
Monitoring Delay (sec)	**15**	**15**	**15**
Monitoring ISD (sec)	**3**	**3**	**3**
Enhancement Threshold (HU)	**50**	**50**	**50**
Diagnostic Delay	**20**	**20**	**20**

Series 3, Scan Phase

	Small	Medium	Large
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**40**	**40**	**40**
Detector Rows	**64.0**	**64.0**	**64.0**
Detector Configuration	**64x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Large Body**	**Large Body**	**Large Body**
Pitch	**0.516**	**0.516**	**0.516**
Speed (mm/rot)	**20.60**	**20.60**	**20.60**
Rotation Time (s)	**0.5**	**0.9**	**1**
kV	**140**	**140**	**140**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(60-480)**	**(50-490)**	**(50-515)**
Manual mA	**300.0**	**250.0**	**340.0**
Noise Index	**12.0**	**16.5**	**24.5**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Series 3, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**16**	**16**	**16**
Recon Type	**Soft**	**Soft**	**Soft**
WW/WL	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**60% / 30% / High**	**60% / 30% / High**	**60% / 30% / High**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**
Recon 2 (Secondary)			
DFOV	**16**	**16**	**16**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**2500/350**	**2500/350**	**2500/350**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**	**None**	**None**
Slice Thickness (mm)	**0.625**	**0.625**	**0.625**
Interval (mm)	**0.312**	**0.312**	**0.312**
Recon 3 (Secondary)			
DFOV	**16**	**16**	**16**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**2500/350**	**2500/350**	**2500/350**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**	**None**	**None**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

If Metal

	Small	Medium	Large
Recon 4 (Secondary)			
DFOV	**16**	**16**	**16**
Recon Type	**Soft**	**Soft**	**Soft**
WW/WL	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
Recon Option	**MARS On**	**MARS On**	**MARS On**
ASiR/ASiR256/DLIR	**60% / 30% / High**	**60% / 30% / High**	**60% / 30% / High**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

16 & 32 Slice Scanner Exceptions:

1. The 0.625mm slice thickness x 0.312mm interval Recon should be 1.25mm slice thickness x 0.625mm interval on 16 and 32 slice CT scanners. The 16 and 32 slice scanners are only able to recon down to 0.625mm slice thickness when using 10mm and/or 20mm beam collimation respectively. However, when using 20mm and/or 40mm beam collimation, they are only capable of reconstructing to 1.25mm slice thickness.
2. MARS feature is not an option.
3. IQ Enhance feature requires thin slices (1.25mm or less) with an interval of half (or less). On older scanner models, in order to enable IQ Enhance at 0.625 mm slice thickness, the interval must be set to 0.311 mm instead of 0.312 mm.

Chest - Standard (Routine and High-Resolution) 5.1/5.2/5.3

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Indication

Evaluate mediastinal abnormality, lung cancer, lymphoma, esophageal carcinoma, metastases, empyema, pleural effusion, lung nodules, pectus excavatum and chest wall lesion. This protocol also replaces the traditional HRCT of the Chest, with optional additional series as indicated.

Video for this protocol

Oral Contrast

None

Pre-Scan Instructions

Practice breathing instructions. Ask patient to cough just prior to the scan.

IV Contrast Parameters 350

Select Ulrich protocol 25

Patient Weight	Contrast Dosage	Injection Rate
All Adults	64 mL Iohexol 350 mgI/mL + 30 mL NaCl flush	3 mL/sec

IV Contrast Parameters 300/370

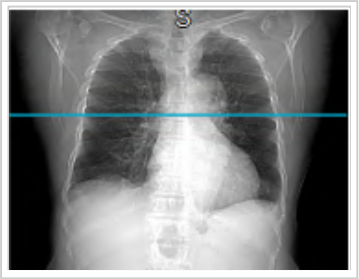
Patient Weight	Contrast Dosage	Injection Rate
All Adults	75 mL Iohexol 300 mgI/mL + 30 mL NaCl flush	3 mL/sec

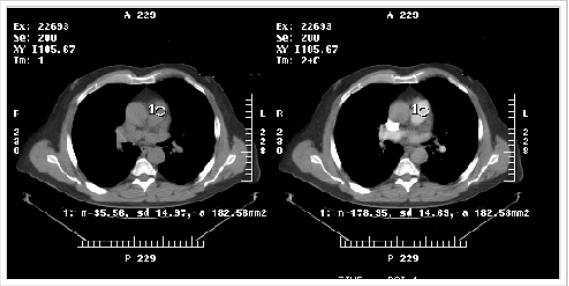
Field of View

Small as appropriate including all of breasts and chest wall.

Scan Description

- Series 1 - PA and lateral scout: from lower neck to diaphragm on inspiration.
- Series 2 - Helical Inspiration
  - Scan Phase: Start just above the lung apices and extend through the lung bases. It there is a history of or suspected lung cancer, include all of the adrenal glands.
  - Smart Prep-Monitor Phase (if giving IV contrast): Center over the pulmonary artery, threshold 100 H.U. No greater than a 50 second delay. For pleural tumor indications, a fixed 60 second delay should be used (i.e. do not use smart Prep in this case, the radiologist will specifically order a fixed delay if required).





- Series 3 (optional) - Sequential/Axial Supine Expiration (only if requested by radiologist) Start just above the lung apices and extend through the lung bases. These scans have a slice thickness of 1.25mm and an interval of 20mm.
- Series 4 (optional) PA and lateral scout (prone): from lower neck to diaphragm on inspiration.
- Series 5 (optional) – Sequential/Axial Prone Inspiration (only if requested by radiologist): Start at carina and extend to lung bases

Reformat Instructions

Perform a manual reformat for the axial MIP. The CO and SA reformats are set-up for DMPR.

Reformats

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
MIPS	THIN ST	Manual	MIP	1500/-700	10	5	axial
SA	LUNG	DMPR	Average	1500/-700	2.5	1.25	sagittal Include the spine and sternum.
CO	LUNG	DMPR	Average	1500/-700	2.5	1.25	coronal Include the spine and sternum.

Networking

- Send the entire study to PACS (ALI_Store) including the Dose Information Slide.
- Note: if smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

Miscellaneous

None

Acquisition Parameters

Series 1, Scout

	Small	Medium	Large
Scout 1 kV	100	120	140
Scout 1 mA	10	10	10
Scout 1 Angle	180	180	180
Scout 2 kV	100	120	140
Scout 2 mA	40	40	40
Scout 2 Angle	90	90	90
WW/WL for Scout	500/50	500/50	500/50

Series 2, Smart Prep

	Small	Medium	Large
mA	**40**	**40**	**40**
Monitoring Delay (sec)	**15**	**15**	**15**
Monitoring ISD (sec)	**3**	**3**	**3**
Enhancement Threshold (HU)	**100**	**100**	**100**
Diagnostic Delay	**Auto Minimum**	**Auto Minimum**	**Auto Minimum**

Series 2, Scan Phase

	Small	Medium	Large
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**40**	**40**	**40**
Detector Rows	**64.0**	**64.0**	**64.0**
Detector Configuration	**64x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Large Body**	**Large Body**	**Large Body**
Pitch	**1.375**	**1.375**	**1.375**
Speed (mm/rot)	**55.00**	**55.00**	**55.00**
Rotation Time (s)	**0.6**	**0.7**	**0.9**
kV	**100**	**120**	**140**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(35-420)**	**(35-540)**	**(25-490)**
Manual mA	**260.0**	**270.0**	**280.0**
Noise Index	**16.5**	**18.5**	**24.0**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.5**	**2.5**	**2.5**

Series 2, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option			
ASiR/ASiR256/DLIR	**30% / 20% / Medium**	**30% / 20% / Medium**	**30% / 20% / Medium**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.5**	**2.5**	**2.5**
Recon 2 (Secondary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**30% / 20% / Medium**	**30% / 20% / Medium**	**30% / 20% / Medium**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**
Recon 3 (Secondary)			
DFOV	**30**	**40**	**50**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**1500/-700**	**1500/-700**	**1500/-700**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**	**None**	**None**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Series 3, Scan Phase

	Small	Medium	Large
Scan Type	**Axial**	**Axial**	**Axial**
Beam Collimation	**1.25**	**1.25**	**1.25**
Detector Rows	**2.0**	**2.0**	**2.0**
Detector Configuration	**2x0.625**	**2x0.625**	**2x0.625**
Scan FOV	**Large Body**	**Large Body**	**Large Body**
Pitch	**1**	**1**	**1**
Speed (mm/rot)	**1.30**	**1.30**	**1.30**
Rotation Time (s)	**0.5**	**0.5**	**0.7**
kV	**100**	**120**	**140**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(30-360)**	**(35-550)**	**(25-460)**
Manual mA	**230.0**	**270.0**	**260.0**
Noise Index	**28.5**	**32.5**	**41.5**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**20**	**20**	**20**

Series 3, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**30**	**40**	**50**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**1500/-700**	**1500/-700**	**1500/-700**
Recon Option	**Full**	**Full**	**Full**
Recon Option			
ASiR/ASiR256/DLIR	**None**	**None**	**None**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**20**	**20**	**20**

Series 4, Scout

	Small	Medium	Large
Scout 1 kV	**100**	**120**	**140**
Scout 1 mA	**10**	**10**	**10**
Scout 1 Angle	**180**	**180**	**180**
Scout 2 kV	**100**	**120**	**140**
Scout 2 mA	**40**	**40**	**40**
Scout 2 Angle	**90**	**90**	**90**
WW/WL for Scout	**500/50**	**500/50**	**500/50**

Series 5, Scan Phase

	Small	Medium	Large
Scan Type	**Axial**	**Axial**	**Axial**
Beam Collimation	**1.25**	**1.25**	**1.25**
Detector Rows	**2.0**	**2.0**	**2.0**
Detector Configuration	**2x0.625**	**2x0.625**	**2x0.625**
Scan FOV	**Large Body**	**Large Body**	**Large Body**
Pitch	**1**	**1**	**1**
Speed (mm/rot)	**1.30**	**1.30**	**1.30**
Rotation Time (s)	**0.5**	**0.5**	**0.7**
kV	**100**	**120**	**140**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(30-360)**	**(35-550)**	**(25-460)**
Manual mA	**230.0**	**270.0**	**260.0**
Noise Index	**28.5**	**32.5**	**41.5**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**20**	**20**	**20**

Series 5, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**30**	**40**	**50**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**1500/-700**	**1500/-700**	**1500/-700**
Recon Option	**Full**	**Full**	**Full**
Recon Option			
ASiR/ASiR256/DLIR	**None**	**None**	**None**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**20**	**20**	**20**

Chest - Low Dose Follow-up/Screening 5.10/5.11/5.12

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Indication

Follow-up of mediastinal abnormality, lung cancer, lymphoma, esophageal carcinoma, metastases, empyema, pleural effusion, lung nodules, and chest wall lesion.

Video for this protocol (low dose f/u)

Also used for Lung Cancer Screening.

Video for this protocol (screening)

Oral Contrast

None

Pre-Scan Instructions

Practice breathing instructions. Ask patient to cough just prior to the scan.

IV Contrast Parameters 350

Select Ulrich protocol 25

Patient Weight	Contrast Dosage	Injection Rate
All Adults	64 mL Iohexol 350 mgI/mL + 30 mL NaCl flush	3 mL/sec

IV Contrast Parameters 300/370

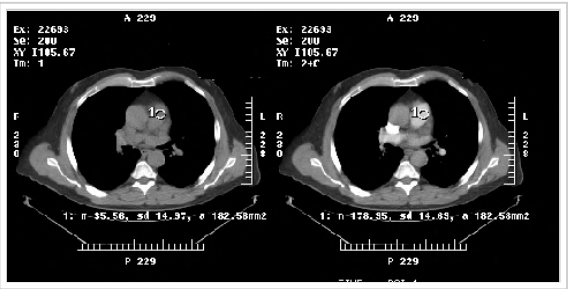
Patient Weight	Contrast Dosage	Injection Rate
All Adults	75 mL Iohexol 300 mgI/mL + 30 mL NaCl flush	3 mL/sec

Field of View

Small as appropriate including all of breasts and chest wall.

Scan Description

- Series 1 - PA and lateral scout: from lower neck to diaphragm on inspiration.
- Series 2 - Helical Inspiration
  - Scan Phase: Start just above the lung apices and extend through the lung bases. It there is a history of or suspected lung cancer, include all of the adrenal glands.
  - Smart Prep-Monitor Phase (if giving IV contrast): Center over the pulmonary artery, threshold 100 H.U. No greater than a 50 second delay.



- Series 3 (optional) - Sequential/Axial Supine Expiration (only if requested by radiologist) Start just above the lung apices and extend through the lung bases. These scans have a slice thickness of 1.25mm and an interval of 20mm.

Reformat Instructions

Perform a manual reformat for the axial MIP. The CO and SA reformats are set-up for DMPR.

Reformats

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
MIPS	THIN ST	Manual	MIP	1500/-700	10	5	axial
SA	LUNG	DMPR	Average	1500/-700	2.5	1.25	sagittal Include the spine and sternum.
CO	LUNG	DMPR	Average	1500/-700	2.5	1.25	coronal Include the spine and sternum.

Networking

- Send the entire study to PACS (ALI_Store) including the Dose Information Slide.
- Note: if smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

Miscellaneous

None

Acquisition Parameters

Series 1, Scout

	Small	Medium	Large
Scout 1 kV	100	120	140
Scout 1 mA	10	10	10
Scout 1 Angle	180	180	180
Scout 2 kV	100	120	140
Scout 2 mA	40	40	40
Scout 2 Angle	90	90	90
WW/WL for Scout	500/50	500/50	500/50

Series 2, Smart Prep

	Small	Medium	Large
mA	**40**	**40**	**40**
Monitoring Delay (sec)	**15**	**15**	**15**
Monitoring ISD (sec)	**3**	**3**	**3**
Enhancement Threshold (HU)	**100**	**100**	**100**
Diagnostic Delay	**Auto Minimum**	**Auto Minimum**	**Auto Minimum**

Series 2, Scan Phase

	Small	Medium	Large
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**40**	**40**	**40**
Detector Rows	**64.0**	**64.0**	**64.0**
Detector Configuration	**64x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Large Body**	**Large Body**	**Large Body**
Pitch	**1.375**	**1.375**	**1.375**
Speed (mm/rot)	**55.00**	**55.00**	**55.00**
Rotation Time (s)	**0.5**	**0.5**	**0.5**
kV	**100**	**120**	**140**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(15-190)**	**(20-280)**	**(20-330)**
Manual mA	**120.0**	**140.0**	**190.0**
Noise Index	**26.5**	**30.5**	**39.0**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.5**	**2.5**	**2.5**

Series 2, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option			
ASiR/ASiR256/DLIR	**30% / 20% / Medium**	**30% / 20% / Medium**	**30% / 20% / Medium**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.5**	**2.5**	**2.5**
Recon 2 (Secondary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**30% / 20% / Medium**	**30% / 20% / Medium**	**30% / 10% / Medium**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**
Recon 3 (Secondary)			
DFOV	**30**	**40**	**50**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**1500/-700**	**1500/-700**	**1500/-700**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**	**None**	**None**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Series 3, Scan Phase

	Small	Medium	Large
Scan Type	**Axial**	**Axial**	**Axial**
Beam Collimation	**1.25**	**1.25**	**1.25**
Detector Rows	**2.0**	**2.0**	**2.0**
Detector Configuration	**2x0.625**	**2x0.625**	**2x0.625**
Scan FOV	**Large Body**	**Large Body**	**Large Body**
Pitch	**1**	**1**	**1**
Speed (mm/rot)	**1.30**	**1.30**	**1.30**
Rotation Time (s)	**0.5**	**0.5**	**0.7**
kV	**100**	**120**	**140**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(30-360)**	**(35-550)**	**(25-460)**
Manual mA	**230.0**	**270.0**	**260.0**
Noise Index	**28.5**	**32.5**	**41.5**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**20**	**20**	**20**

Series 3, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**30**	**40**	**50**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**1500/-700**	**1500/-700**	**1500/-700**
Recon Option	**Full**	**Full**	**Full**
Recon Option			
ASiR/ASiR256/DLIR	**None**	**None**	**None**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**20**	**20**	**20**

Chest - CTPA for PE 5.16/5.17/5.18

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Indication

Evaluate for known or suspected pulmonary embolism.

Video for this protocol

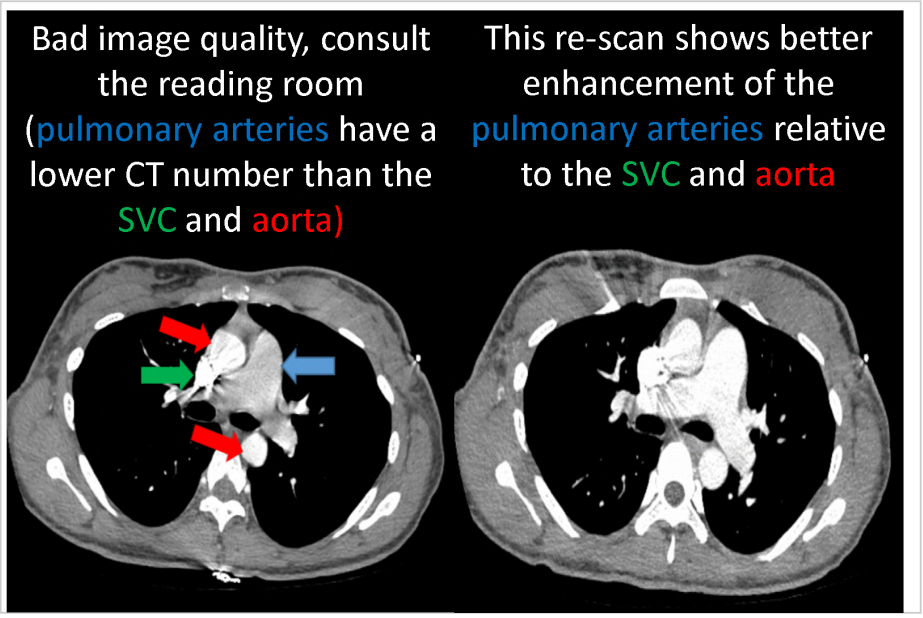
Oral Contrast

None

Pre-Scan Instructions

Practice the 3 breaths for scouts, smart prep, and the actual helical scan, we do not want to induce a transient interruption of contrast (TIC) which would can mimic a PE and or produce an indeterminate exam. Please give the patient these EXACT instructions: **"When you take your last breath before the exam, take a full breath but gently hold. Do not bear down, tense up, or strenuously hold your breath. This exam will be over in about 4 seconds from when we tell you hold your breath to when you may breath again.**

We would like to visualize contrast in the pulmonary arteries and aorta because this is a double rule out protocol. If you see the contrast in the pulmonary arteries at a much lower intensity than the SVC and aorta, the patient likely had a TIC which kept the PA from enhancing correctly. This is not a scan timing issue, but an issue with un-opacified blood entering the heart faster from the IVC than opacified blood from the SVC caused by a pressure imbalance between the thorax and abdomen. This is why the breathing instructions we provide above are critical for this exam. As a guidance tool, a good PE exam will have an enhancement threshold of 300 HU.



If your exam looks like the one shown here on the left, please call the reading room and have them review the images before letting the patient leave the CT suite.

Ventilated patients will be scanned on inspiration to ensure safety of RT Staff.

IV Contrast Parameters 350

Select Ulrich protocols 26-28

Weight Ranges	Contrast Dosage	Injection Rate
<250 lbs. (<113.4 kg)	86 mL Iohexol 350 mgI/mL + 10 mL NaCl flush	5 mL/sec
250-300 lbs (113.4-136 kg)	106 mL Iohexol 350 mgI/mL + 10 mL NaCl flush	5 mL/sec
>300 lbs (>136 kg)	159 mL Iohexol 350 mgI/mL + 10 mL NaCl flush	5 mL/sec
18 G Antecubital IV Started in the Right Arm		

IV Contrast Parameters 300/370

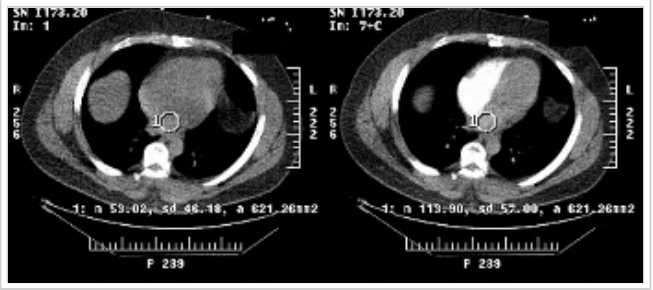
Weight Ranges	Contrast Dosage	Injection Rate
<250 lbs. (<113.4 kg)	100 mL Iohexol 300 mgI/mL + 10 mL NaCl flush	5 mL/sec
250-300 lbs (113.4-136 kg)	100 mL Iopamidol 370 mgI/mL (Isovue) + 10 mL NaCl flush	5 mL/sec
>300 lbs (>136 kg)	150 mL Iopamidol 370 mgI/mL (Isovue) + 10 mL NaCl flush	5 mL/sec
18 G Antecubital IV Started in the Right Arm		

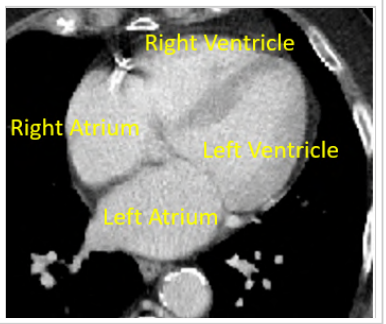
Field of View

Smallest possible to include all of chest including axillae and breasts.

Scan Description

- Series 1 - PA and lateral scouts: from lower neck to diaphragm using the suspension breathing instructions
- Series 2 –Helical Scan
  - Scan Phase: Start scan above lung apices (first rib) and scan through lung bases/costophrenic angles with IV Contrast. Inspiratory breathing instructions are on, remind the patient not to bear down or strain.
  - Smart Prep-Monitor Phase: Place ROI on Lt atrium; Watch for atrial filling with contrast on the bolus tracking scan and then start using manual start, no delay is needed.





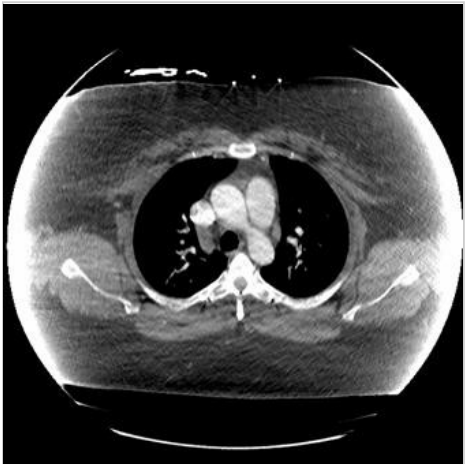
Adjustments for Bariatric PE and Cardiac Studies We do not have a bariatric protocol for chest PE or cardiac (retrospectively or prospectively gated coronaries) studies. Our large protocol is already designed to deliver a higher maximum dose than the medium and small adult protocols, but it uses 120 kV to maximize iodine contrast. Other large adult protocols that are not angiograms use 140 kV for large adults. Therefore, for bariatric patients who 1. **fill the scout view** or 2. **max out the mA table** please increase the kV from 120 kV to 140 kV.

Note: If you know the patient is likely to max out the mA table before taking the scout, you should increase the scout kV from 120 to 140.

Example of a patient **filling the scout view**

Example patient **filling the scout AP view**

Example patient **filling the scout lateral view**



Resulting poor image quality from a patient who **fills the scout**

Reformat Instructions

In the United States, CT Angiography CPT codes require the performance and documentation of 3D angiographic rendering, which may include maximum intensity projection (MIP), volumetric rendering, and/or surface rendering techniques.

Reformats

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
SA	THIN LUNG	DMPR	Average	1500/-700	2.5	1.25	sagittal Include the spine and sternum.
CO	THIN LUNG	DMPR	Average	1500/-700	2.5	1.25	coronal Include the spine and sternum.
MIPS	THIN ST	Manual	MIP	920/125	10	5	Axial

Networking

- Send the entire study to PACS (ALI_Store) including the Dose Information Slide.
- Note: if smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

Miscellaneous

None

Acquisition Parameters

Series 1, Scout

	Small	Medium	Large
Scout 1 kV	**100**	**120**	**140**
Scout 1 mA	**10**	**10**	**20**
Scout 1 Angle	**180**	**180**	**180**
Scout 2 kV	**100**	**120**	**140**
Scout 2 mA	**40**	**40**	**40**
Scout 2 Angle	**90**	**90**	**90**
WW/WL for Scout	**500/50**	**500/50**	**500/50**

Series 2, Smart Prep

	Small	Medium	Large
mA	**40**	**40**	**40**
Monitoring Delay (sec)	**2.0**	**2.0**	**2.0**
Monitoring ISD (sec)	**1.0**	**1.0**	**1.0**
Enhancement Threshold (HU)	**60**	**60**	**60**
Diagnostic Delay	**Auto Minimum**	**Auto Minimum**	**Auto Minimum**

Series 2, Scan Phase

	Small	Medium	Large
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**40**	**40**	**40**
Detector Rows	**64.0**	**64.0**	**64.0**
Detector Configuration	**64x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Large Body**	**Large Body**	**Large Body**
Pitch	**1.375**	**1.375**	**1.375**
Speed (mm/rot)	**55.00**	**55.00**	**55.00**
Rotation Time (s)	**0.5**	**0.7**	**0.8**
kV	**100**	**100**	**120**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(35-450)**	**(30-480)**	**(35-560)**
Manual mA	**230.0**	**250.0**	**380.0**
Noise Index	**30.0**	**46.0**	**50.0**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Series 2, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**30% / 20% / Medium**	**30% / 20% / Medium**	**30% / 20% / Medium**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**
Recon 2 (Secondary)			
DFOV	**30**	**40**	**50**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**1500/-700**	**1500/-700**	**1500/-700**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**	**None**	**None**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Chest- Esophagography 5.51/5.52/5.53

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Indication

To eval for leak in patients who are post- esophogectomy.

Also use for patients with pneumomediastinum to eval for esophageal trauma.

Oral Contrast

Mix 25mL Iohex 300 in 75 mL water to total 100mL Ask patient to drink majority of the solution (75- 80 mL) and save the remainder. Scan scouts, non-con and give the patient the remainder of the oral contrast just prior to oral contrast phase. Give to patient on scanner, with a straw if possible, ask them to hold it in thier mouth until instructed to swallow. Ask patient to swallow, then initiate scan phase/ inspiration breathing instructions. Give a little time so patient does not aspirate.

Pre-Scan Instructions

Practice breathing instructions. Ask patient to cough just prior to the scan.

IV Contrast Parameters 350

Contrast will rarely be indicated for this protocol as IV contrast will cause streaking artifact in the veins in the thoracic outlet.

Select Ulrich protocol 25

Patient Weight	Contrast Dosage	Injection Rate
All Adults	64 mL Iohexol 350 mgI/mL + 30 mL NaCl flush	3 mL/sec

IV Contrast Parameters 300/370

Contrast will rarely be indicated for this protocol as IV contrast will cause streaking artifact in the veins in the thoracic outlet.

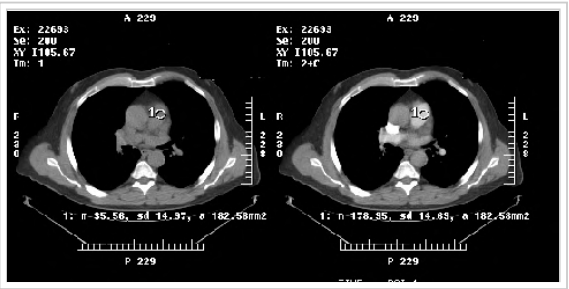
Patient Weight	Contrast Dosage	Injection Rate
All Adults	75 mL Iohexol 300 mgI/mL + 30 mL NaCl flush	3 mL/sec

Field of View

Small as appropriate including all of breasts and chest wall.

Scan Description

- Series 1 - PA and lateral scout: from lower neck to diaphragm on inspiration.
- Series 2 - Helical Non-Con Inspiration
  - Coverage: Start just above the lung apices and extend through the lung bases.
- Series 3 - Helical phase with oral contrast
  - Scan Phase: Have patient drink the remaining 20mL of oral contrast through a straw, hold it in their mouth, and swallow just prior to scan.
  - Coverage: Same as non-con
  - Smart Prep-Monitor Phase (if giving IV contrast): Center over the pulmonary artery, threshold 100 H.U.



- Series 4 (optional) - Prone Helical Inspiration - Check with radiologist to see if prone images are indicated.
  - Coverage: Same as prior series

Reformat Instructions

Perform a manual reformat for the axial MIP. The CO and SA reformats are set-up for DMPR.

Reformats

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
MIPS	THIN ST	Manual	MIP	1500/-700	10	5	axial
SA	LUNG	DMPR	Average	1500/-700	2.5	1.25	sagittal Include the spine and sternum.
CO	LUNG	DMPR	Average	1500/-700	2.5	1.25	coronal Include the spine and sternum.

Networking

- Send the entire study to PACS (ALI_Store) including the Dose Information Slide.
- Note: if smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

Miscellaneous

None

Acquisition Parameters

Series 1, Scout

	Small	Medium	Large
Scout 1 kV	100	120	140
Scout 1 mA	10	10	10
Scout 1 Angle	180	180	180
Scout 2 kV	100	120	140
Scout 2 mA	40	40	40
Scout 2 Angle	90	90	90
WW/WL for Scout	500/50	500/50	500/50

Series 2, Scan Phase

	Small	Medium	Large
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**40**	**40**	**40**
Detector Rows	**64.0**	**64.0**	**64.0**
Detector Configuration	**64x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Large Body**	**Large Body**	**Large Body**
Pitch	**1.375**	**1.375**	**1.375**
Speed (mm/rot)	**55.00**	**55.00**	**55.00**
Rotation Time (s)	**0.6**	**0.7**	**0.9**
kV	**100**	**120**	**140**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(35-420)**	**(35-540)**	**(25-490)**
Manual mA	**260.0**	**270.0**	**280.0**
Noise Index	**16.5**	**18.5**	**24.0**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.5**	**2.5**	**2.5**

Series 2, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option			
ASiR/ASiR256/DLIR	**30% / 20% / Medium**	**30% / 20% / Medium**	**30% / 20% / Medium**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.5**	**2.5**	**2.5**
Recon 2 (Secondary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**30% / 20% / Medium**	**30% / 20% / Medium**	**30% / 20% / Medium**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**
Recon 3 (Secondary)			
DFOV	**30**	**40**	**50**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**1500/-700**	**1500/-700**	**1500/-700**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**	**None**	**None**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Series 3, Smart Prep

	Small	Medium	Large
mA	**40**	**40**	**40**
Monitoring Delay (sec)	**15**	**15**	**15**
Monitoring ISD (sec)	**3**	**3**	**3**
Enhancement Threshold (HU)	**100**	**100**	**100**
Diagnostic Delay	**Auto Minimum**	**Auto Minimum**	**Auto Minimum**

Series 3, Scan Phase

	Small	Medium	Large
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**40**	**40**	**40**
Detector Rows	**64.0**	**64.0**	**64.0**
Detector Configuration	**64x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Large Body**	**Large Body**	**Large Body**
Pitch	**1.375**	**1.375**	**1.375**
Speed (mm/rot)	**55.00**	**55.00**	**55.00**
Rotation Time (s)	**0.6**	**0.7**	**0.9**
kV	**100**	**120**	**140**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(35-420)**	**(35-540)**	**(25-490)**
Manual mA	**260.0**	**270.0**	**280.0**
Noise Index	**16.5**	**18.5**	**24.0**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.5**	**2.5**	**2.5**

Series 3, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option			
ASiR/ASiR256/DLIR	**30% / 20% / Medium**	**30% / 20% / Medium**	**30% / 20% / Medium**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.5**	**2.5**	**2.5**
Recon 2 (Secondary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**30% / 20% / Medium**	**30% / 20% / Medium**	**30% / 20% / Medium**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**
Recon 3 (Secondary)			
DFOV	**30**	**40**	**50**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**1500/-700**	**1500/-700**	**1500/-700**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**	**None**	**None**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Series 4, Scan Phase

	Small	Medium	Large
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**40**	**40**	**40**
Detector Rows	**64.0**	**64.0**	**64.0**
Detector Configuration	**64x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Large Body**	**Large Body**	**Large Body**
Pitch	**1.375**	**1.375**	**1.375**
Speed (mm/rot)	**55.00**	**55.00**	**55.00**
Rotation Time (s)	**0.6**	**0.7**	**0.9**
kV	**100**	**120**	**140**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(35-420)**	**(35-540)**	**(25-490)**
Manual mA	**260.0**	**270.0**	**280.0**
Noise Index	**16.5**	**18.5**	**24.0**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.5**	**2.5**	**2.5**

Series 4, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option			
ASiR/ASiR256/DLIR	**30% / 20% / Medium**	**30% / 20% / Medium**	**30% / 20% / Medium**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.5**	**2.5**	**2.5**
Recon 2 (Secondary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**30% / 20% / Medium**	**30% / 20% / Medium**	**30% / 20% / Medium**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**
Recon 3 (Secondary)			
DFOV	**30**	**40**	**50**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**1500/-700**	**1500/-700**	**1500/-700**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**	**None**	**None**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Chest - Dynamic 3D Airway 5.70/5.71/5.72

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Indication

Evaluate airway for stenosis, tumor, tracheo(broncho)malacia.

Oral Contrast

None

Pre-Scan Instructions

Practice breathing instructions. Ask patient to cough just prior to the scan. **Coach patient again before expiration. Expiratory scan should be performed during *forced exhalation* (use manual breathing instructions)**

IV Contrast Parameters 350

Select the Ulrich Weight-Based Adult 4mL protocol which will load the following settings: Saline Test Bolus 4mL/sec Weight based volume 4mL/sec (see below) Saline Flush 30 mL at a rate of 4mL/sec

Patient Weight	Contrast Dosage	Injection Rate
All Adults	86 mL Iohexol 350 mgI/mL + 30 mL NaCl flush	4 mL/sec
Only if requested by Radiologist for known or suspected central airway tumor.		

For sites without the Ulrich use Medrad p3T or refer to the weight-based contrast tables included with the protocol booklet.

IV Contrast Parameters 300/370

Patient Weight	Contrast Dosage	Injection Rate
All Adults	100 mL Iohexol 300 mgI/mL + 30 mL NaCl flush	4 mL/sec
Only if requested by Radiologist for known or suspected central airway tumor.		

Field of View

Smallest possible to include all of chest including axillae and breasts.

Scan Description

- Series 1 - PA & lateral scouts: from mid-neck to diaphragm on inspiration.
- Series 2 - Inspiration: Start scan mid-neck C3 – C4 and extend through the diaphragm to include entirety of lungs.
- Series 3 - Dynamic forced expiration: Start scan mid-neck C3 – C4 and extend through top of diaphragm

Reformat Instructions

No reformats unless requested by a Radiologist

Reformats

None.

Networking

- Send the entire study to PACS (ALI_Store) including the Dose Information Slide.
- Note: if smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

Miscellaneous

None

Acquisition Parameters

Series 1, Scout

	Small	Medium	Large
Scout 1 kV	**100**	**120**	**140**
Scout 1 mA	**10**	**10**	**10**
Scout 1 Angle	**180**	**180**	**180**
Scout 2 kV	**100**	**120**	**140**
Scout 2 mA	**40**	**40**	**40**
Scout 2 Angle	**90**	**90**	**90**
WW/WL for Scout	**500/50**	**500/50**	**500/50**

Series 2, Scan Phase

	Small	Medium	Large
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**40**	**40**	**40**
Detector Rows	**64.0**	**64.0**	**64.0**
Detector Configuration	**64x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Large Body**	**Large Body**	**Large Body**
Pitch	**1.375**	**1.375**	**1.375**
Speed (mm/rot)	**55.00**	**55.00**	**55.00**
Rotation Time (s)	**0.6**	**0.7**	**0.9**
kV	**100**	**120**	**140**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(35-420)**	**(35-540)**	**(25-490)**
Manual mA	**260.0**	**270.0**	**280.0**
Noise Index	**16.5**	**18.5**	**24.0**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.5**	**2.5**	**2.5**

Series 2, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option			
ASiR/ASiR256/DLIR	**30% / 20% / Medium**	**30% / 20% / Medium**	**30% / 20% / Medium**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.5**	**2.5**	**2.5**
Recon 2 (Secondary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**30% / 20% / Medium**	**30% / 20% / Medium**	**30% / 20% / Medium**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**
Recon 3 (Secondary)			
DFOV	**30**	**40**	**50**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**1500/-700**	**1500/-700**	**1500/-700**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**	**None**	**None**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Series 3, Scan Phase

	Small	Medium	Large
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**40**	**40**	**40**
Detector Rows	**64.0**	**64.0**	**64.0**
Detector Configuration	**64x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Large Body**	**Large Body**	**Large Body**
Pitch	**1.375**	**1.375**	**1.375**
Speed (mm/rot)	**55.00**	**55.00**	**55.00**
Rotation Time (s)	**0.5**	**0.5**	**0.5**
kV	**100**	**120**	**140**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(15-190)**	**(20-280)**	**(20-330)**
Manual mA	**120.0**	**140.0**	**190.0**
Noise Index	**26.5**	**30.5**	**39.0**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.5**	**2.5**	**2.5**

Series 3, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option			
ASiR/ASiR256/DLIR	**30% / 20% / Medium**	**30% / 20% / Medium**	**30% / 20% / Medium**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.5**	**2.5**	**2.5**
Recon 2 (Secondary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**30% / 20% / Medium**	**30% / 20% / Medium**	**30% / 20% / Medium**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**
Recon 3 (Secondary)			
DFOV	**30**	**40**	**50**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**1500/-700**	**1500/-700**	**1500/-700**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**	**None**	**None**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Upper Extremity CTA 4.10/4.11/4.12

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Indication

R/O arterial injury, embolus, vasculitis, peripheral vascular disease in the upper extremity.

Oral Contrast

None

Pre-Scan Instructions

Patient positioned prone with affected extremity (i.e., arm) overhead in "superman" position and positioned in the center of the scanner. Hand should be placed flat palm down on the couch. The non-affected extremity (with IV) should be placed at the patient's side. Try to off center the patients body so the affected arm is midline in the scanner. Practice breathing instructions. Ask patient to cough just prior to the scan. If the patient cannot lie prone, supine and lateral positioning are acceptable alternatives. If the patient cannot raise their arm above their head, a supine position with their arm at the side may be attempted as a last resort.

IV Contrast Parameters 350

Select Ulrich protocols 53-55

Weight Ranges	Contrast Dosage	Injection Rate
<200 lbs. (<90 kg)	106 mL Iohexol 350 mgI/mL + 50 mL NaCl flush	5 mL/sec
200-300 lbs (90-136 kg)	132 mL Iohexol 350 mgI/mL + 50 mL NaCl flush	5.5 mL/sec
>300 lbs (>136 kg)	159 mL Iohexol 350 mgI/mL + 50 mL NaCl flush	6 mL/sec
18 G Antecubital IV Started in the non-affected extremity		

IV Contrast Parameters 300/370

Weight Ranges	Contrast Dosage	Injection Rate
<200 lbs. (<90 kg)	100 mL Iopamidol 370 mgI/mL (Isovue) + 50 mL NaCl flush	5 mL/sec
200-300 lbs (90-136 kg)	125 mL Iopamidol 370 mgI/mL (Isovue) + 50 mL NaCl flush	5.5 mL/sec
>300 lbs (>136 kg)	150 mL Iopamidol 370 mgI/mL (Isovue) + 50 mL NaCl flush	6 mL/sec
18 G Antecubital IV Started in the non-affected extremity		

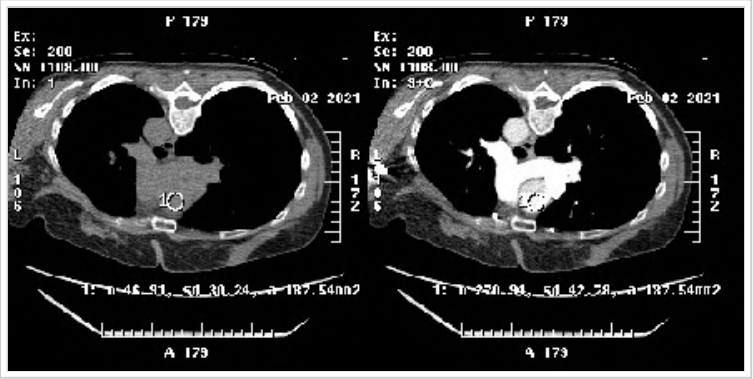
Field of View

As small as possible to a minimum of 32 cm, while still including entire arm and brachiocephalic artery.

Scan Description

- **Series 1** – PA and lateral scout
  - Coverage: diaphragm to finger tips
- **Series 2** – Non-contrast
  - Coverage:
    - ACUTE EMBOLISM: Diaphragm through the fingertips.
    - ROUTINE: Carina through fingertips.
    - FOCUSED: As specified by Radiologist. If not specified, then contact protocolling physician to determine appropriate coverage.
- **Series 3** - CTA
  - 1st Group: Coverage: Exact same as non-con

- 2nd Group: Immediately follow with 2nd scan from the elbow to the fingertips.
- Smart prep on the ascending aorta at the level of the carina



Reformat Instructions

See table below.

In the United States, CT Angiography CPT codes require the performance and documentation of 3D angiographic rendering, which may include maximum intensity projection (MIP), volumetric rendering, and/or surface rendering techniques.

Reformats

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
CO	Thin ST	Manual	MIP	450/50	1.25	0.625	CORONAL from skin to skin

Networking

- All the images are sent to PACS (ALI_Store) and 3D Lab workstation.
- Note: if smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

Miscellaneous

None

Acquisition Parameters

Series 1, Scout

	Small	Medium	Large
Scout 1 kV	100	120	140
Scout 1 mA	10	10	10
Scout 1 Angle	180	180	180
Scout 2 kV	100	120	140
Scout 2 mA	40	40	80
Scout 2 Angle	90	90	90
WW/WL for Scout	500/50	500/50	500/50

Series 2, Scan Phase

	Small	Medium	Large
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**40**	**40**	**40**
Detector Rows	**64.0**	**64.0**	**64.0**
Detector Configuration	**64x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Large Body**	**Large Body**	**Large Body**
Pitch	**1.375**	**1.375**	**1.375**
Speed (mm/rot)	**55.00**	**55.00**	**55.00**
Rotation Time (s)	**0.5**	**0.5**	**0.7**
kV	**100**	**120**	**140**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(25-430)**	**(25-530)**	**(25-480)**
Manual mA	**210.0**	**270.0**	**290.0**
Noise Index	**24.0**	**31.0**	**39.0**
Slice Thickness (mm)	**2.5**	**2.5**	**2.5**
Interval (mm)	**1.5**	**1.5**	**1.5**

Series 2, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option			
ASiR/ASiR256/DLIR	**30% / 20% / Medium**	**30% / 20% / Medium**	**30% / 10% / Medium**
Slice Thickness (mm)	**2.5**	**2.5**	**2.5**
Interval (mm)	**1.5**	**1.5**	**1.5**

Series 3, Smart Prep

	Small	Medium	Large
mA	**40**	**40**	**40**
Monitoring Delay (sec)	**4**	**4**	**4**
Monitoring ISD (sec)	**1.0**	**1.0**	**1.0**
Enhancement Threshold (HU)	**80**	**80**	**80**
Diagnostic Delay	**Auto Minimum**	**Auto Minimum**	**Auto Minimum**

Series 3, Group 1, Scan Phase

	Small	Medium	Large
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**40**	**40**	**40**
Detector Rows	**64.0**	**64.0**	**64.0**
Detector Configuration	**64x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Large Body**	**Large Body**	**Large Body**
Pitch	**0.984**	**0.984**	**0.984**
Speed (mm/rot)	**39.40**	**39.40**	**39.40**
Rotation Time (s)	**0.5**	**0.5**	**0.5**
kV	**100**	**100**	**120**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(80-480)**	**(90-480)**	**(110-560)**
Manual mA	**240.0**	**380.0**	**530.0**
Noise Index	**12.0**	**18.5**	**22.5**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Series 3, Group 1, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**30% / 20% / Medium**	**30% / 20% / Medium**	**30% / 20% / Medium**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Series 3, Group 2, Scan Phase

	Small	Medium	Large
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**40**	**40**	**40**
Detector Rows	**64.0**	**64.0**	**64.0**
Detector Configuration	**64x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Large Body**	**Large Body**	**Large Body**
Pitch	**0.984**	**0.984**	**0.984**
Speed (mm/rot)	**39.40**	**39.40**	**39.40**
Rotation Time (s)	**0.5**	**0.5**	**0.5**
kV	**100**	**100**	**120**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(80-480)**	**(90-480)**	**(110-560)**
Manual mA	**240.0**	**380.0**	**530.0**
Noise Index	**12.0**	**18.5**	**22.5**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Series 3, Group 2, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**30% / 20% / Medium**	**30% / 20% / Medium**	**30% / 20% / Medium**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Non-Gated CTA (Chest/Abd/Pelvis) 5.28/5.29/5.30

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Indication

Evaluate for known or suspected type “B” (descending) aortic dissection, intramural hematoma (IMH), aneurysm, leak, tear, or vasculitis.

Guidelines for using this protocol: (Note, please consult the protocolling radiologist if you have any questions on this protocol's use or if the order appears to not meet the criteria below.)

1. These studies require a non-contrast series first:
    - Acute aorta
        - Aortic dissection
        - Intramural hematoma
        - Penetrating atherosclerotic ulcer
    - Post-operative aorta
        - Endovascular repair (EVAR, TEVAR, FEVAR, PEVAR)
        - Open repair
2. These studies only require a single series: In the event that a non-contrast aneurysm evaluation is ordered, please skip the without series and **scan using the CTA series** in order to take advantage of higher dose.
    - Aortic aneurysm
        - Initial evaluation
        - Follow-up
3. These studies require a delay phase
    - Evaluate for endoleak on an endostent

Video for this protocol

Oral Contrast

None

Pre-Scan Instructions

Practice breathing instructions. Ask patient to cough just prior to the scan.

IV Contrast Parameters 350

Select Ulrich protocols 56-58

Weight Ranges	Contrast Dosage	Injection Rate
<200 lbs. (<90 kg)	106 mL of Iohexol 350 mgI/mL + 50 mL NaCl flush	5 mL/sec
200-300 lbs (90-136 kg)	132 mL of Iohexol 350 mgI/mL + 50 mL NaCl flush	5.5 mL/sec
>300 lbs (>136 kg)	159 mL of Iohexol 350 mgI/mL + 50 mL NaCl flush	6 mL/sec
18 G Antecubital IV Started in the Right Arm		

IV Contrast Parameters 300/370

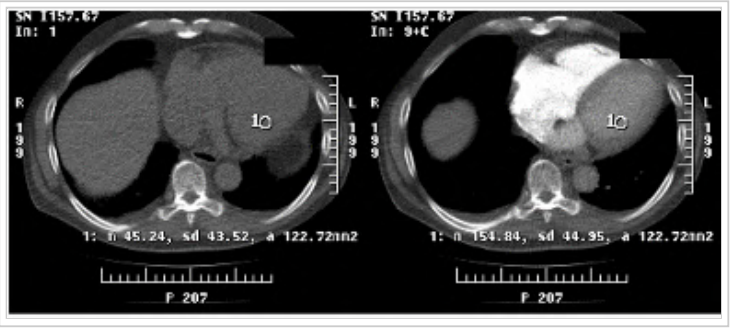
Weight Ranges	Contrast Dosage	Injection Rate
<200 lbs. (<90 kg)	100 mL of Iopamidol 370 mgI/mL (Isovue) + 50 mL NaCl flush	5 mL/sec
200-300 lbs (90-136 kg)	125 mL of Iopamidol 370 mgI/mL (Isovue) + 50 mL NaCl flush	5.5 mL/sec
>300 lbs (>136 kg)	150 mL of Iopamidol 370 mgI/mL (Isovue) + 50 mL NaCl flush	6 mL/sec
18 G Antecubital IV Started in the Right Arm		

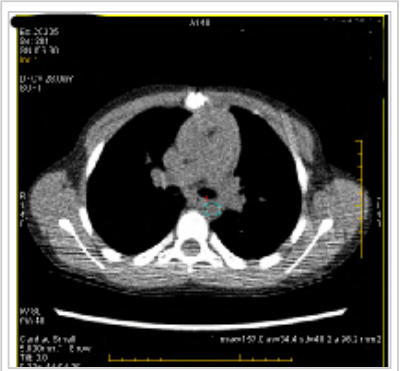
Field of View

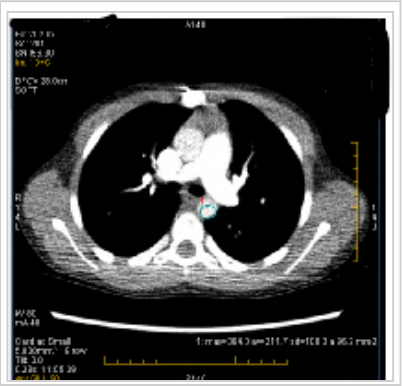
As small as possible to a minimum of 32 cm, while still including entire lungs and abdomen (can clip subcutaneous fat). Be sure to include femoral arteries if pelvis is included.

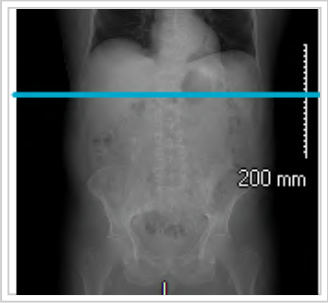
Scan Description

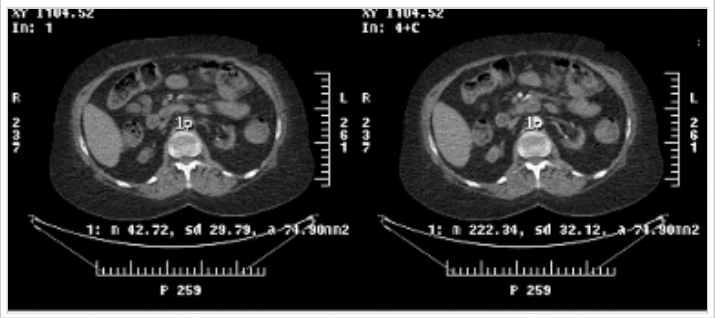
- **Series 1** - PA and lateral scout
  - Coverage:
    - Chest: Lower neck to mid-abdomen
    - Abd/Pelvis: Diaphragm to upper thighs
- **Series 2** - Non-contrast (only when ordered)
  - Coverage:
    - Chest: Lung apex to below the sma
    - Abdomen: Diaphragm to iliac crests
    - Pelvis: Iliac crests to lesser trochanters
- **Series 3** - CTA Coverage: Same as non-contrast scan. If chest is included, please adjust the lung recon to cover chest only.
  - If chest is included on the **non-revolution** scanner: Smartprep on left ventricle
  - If chest is included on the **revolution 256** scanner: Smartprep on descending aorta. **Dynamic transition is turned on so the scan will progress without the need for you to hit 'scan phase'.**
  - If chest is not included: Smartprep on mid abdominal aorta
- **Series 4** (optional) – Delayed (Only needed to detect slow leak, for example, when evaluating endostents for endoleak)
  - Begin scan 2 min after beginning of contrast injection
  - Coverage: Same as non-contrast scan











Reformat Instructions

- C/A/P = DMPR CO Body and SA Body is set up for the entire C/A/P. Please preform the chest reformats manually.
- Abdomen/Pelvis only = DMPR CO Body and SA Body is set up for the A/P.
- Chest only = Please preform the chest reformats manually.

In the United States, CT Angiography CPT codes require the performance and documentation of 3D angiographic rendering, which may include maximum intensity projection (MIP), volumetric rendering, and/or surface rendering techniques.

Reformats

CAP or ABD/PELVIS only table

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
SA CV	THIN ST	DMPR	Average	450/50	3	2	sagittal
CO CV	THIN ST	DMPR	Average	450/50	3	2	coronal
CO MIP	THIN ST	DMPR	MIP	800/150	10	2.5	coronal

For the CAP, also do these for the lung field

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
MIPS	THIN ST	Manual	MIP	1500/-700	10	5	axial
SA	LUNG	Manual	Average	1500/-700	2.5	1.25	sagittal Include the spine and sternum.
CO	LUNG	Manual	Average	1500/-700	2.5	1.25	coronal Include the spine and sternum.

Networking

- Send the entire study to PACS (ALI_Store) including the Dose Information Slide.
- Send THIN ST CTA series to CTAW1/ 3D lab.
- Note: if smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

Miscellaneous

None

Acquisition Parameters

Series 1, Scout

	Small	Medium	Large
Scout 1 kV	100	120	140
Scout 1 mA	10	10	10
Scout 1 Angle	180	180	180
Scout 2 kV	100	120	140
Scout 2 mA	40	40	80
Scout 2 Angle	90	90	90
WW/WL for Scout	500/50	500/50	500/50

Series 2, Scan Phase

	Small	Medium	Large
Scan Type	Helical	Helical	Helical
Beam Collimation	40	40	40
Detector Rows	64.0	64.0	64.0
Detector Configuration	64x0.625	64x0.625	64x0.625
Scan FOV	Large Body	Large Body	Large Body
Pitch	1.375	1.375	1.375
Speed (mm/rot)	55.00	55.00	55.00
Rotation Time (s)	0.7	0.7	1
kV	100	120	140
AEC type	smart mA	smart mA	smart mA
mA Range	(30-450)	(30-560)	(25-490)
Manual mA	220.0	280.0	300.0
Noise Index	28.5	36.0	45.5
Slice Thickness (mm)	1.25	1.25	1.25
Interval (mm)	0.625	0.625	0.625

Series 2, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**30% / 20% / Medium**	**30% / 20% / Medium**	**30% / 10% / Medium**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Series 3, Smart Prep

	Small	Medium	Large
mA	**40**	**40**	**40**
Monitoring Delay (sec)	**10**	**10**	**10**
Monitoring ISD (sec)	**1**	**1**	**1**
Enhancement Threshold (HU)	**100**	**100**	**100**
Diagnostic Delay	**6**	**6**	**6**

Series 3, Scan Phase

	Small	Medium	Large
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**40**	**40**	**40**
Detector Rows	**64.0**	**64.0**	**64.0**
Detector Configuration	**64x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Large Body**	**Large Body**	**Large Body**
Pitch	**0.516**	**0.516**	**0.516**
Speed (mm/rot)	**20.60**	**20.60**	**20.60**
Rotation Time (s)	**0.7**	**0.7**	**0.7**
kV	**80**	**100**	**120**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(25-390)**	**(20-420)**	**(25-490)**
Manual mA	**200.0**	**210.0**	**300.0**
Noise Index	**28.0**	**34.0**	**41.5**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Series 3, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**30% / 20% / Medium**	**30% / 20% / Medium**	**30% / 20% / Medium**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**
Recon 2 (Secondary)			
DFOV	**30**	**40**	**50**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**1500/-700**	**1500/-700**	**1500/-700**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**	**None**	**None**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Series 4, Scan Phase

	Small	Medium	Large
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**40**	**40**	**40**
Detector Rows	**64.0**	**64.0**	**64.0**
Detector Configuration	**64x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Large Body**	**Large Body**	**Large Body**
Pitch	**0.516**	**0.516**	**0.516**
Speed (mm/rot)	**20.60**	**20.60**	**20.60**
Rotation Time (s)	**0.6**	**0.5**	**0.5**
kV	**80**	**100**	**120**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(20-340)**	**(20-440)**	**(25-520)**
Manual mA	**170.0**	**220.0**	**310.0**
Noise Index	**32.5**	**39.5**	**48.0**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Series 4, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**30% / 20% / Medium**	**30% / 20% / Medium**	**30% / 20% / Medium**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Retrospectively-Gated CTA Chest (Non-Coronary) 5.31/5.32/5.33

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Indication

Selecting between Prospectively and Retrospectively Gated CTA chest protocols:

- < 70 bpm with regular heart rate = Prospectively Gated (70%)
- >70 bpm with regular heart rate = Prospectively Gated (35%)
- Irregular heart rate = Retrospectively Gated
- What constitutes an irregular heart rate? Anyone with a heart rate that varies more than 10 beats.

Guidelines for using this protocol: (Note, please consult the protocolling radiologist if you have any questions on this protocol's use or if the order appears to not meet the criteria below.)

1. These studies require a non-contrast series first:
    - Acute aorta
        - Aortic dissection
        - Intramural hematoma
        - Penetrating atherosclerotic ulcer
    - Post-operative aorta
        - Endovascular repair (EVAR, TEVAR, FEVAR, PEVAR)
        - Open repair
2. These studies only require a single series: In the event that a non-contrast aneurysm evaluation is ordered, please skip the without series and **scan using the CTA series** in order to take advantage of higher dose.
    - Aortic aneurysm
        - Initial evaluation
        - Follow-up

Video for this protocol

Oral Contrast

None

Pre-Scan Instructions

- Tilt Gantry to S10,then back to zero, when it gets back to zero press both tilt buttons at the same time to "reset" the scanner.
- Practice Breathing Instructions. Ask patient to cough just prior to the scan.

IV Contrast Parameters 350

Select Ulrich Weight-Based Retro Chest protocols 59-65

- 18G IV started in right arm

For sites without the Ulrich use Medrad p3T PA or refer to the weight-based contrast tables included with the protocol booklet.

IV Contrast Parameters 300/370

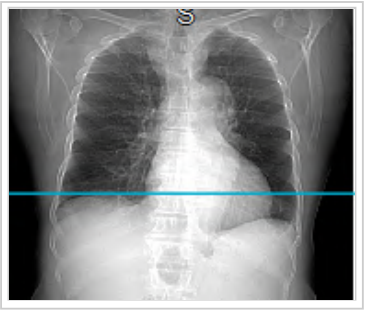
- 18G IV started in right arm
- Use the Medrad™ P3T PA protocol (370 mgI/mL)
  - To set up P3T,
    - Choose P3T --> Thorax --> PA then click okay. Confirm contrast and load injector.
    - After you set up the scan, enter scan duration and click okay.

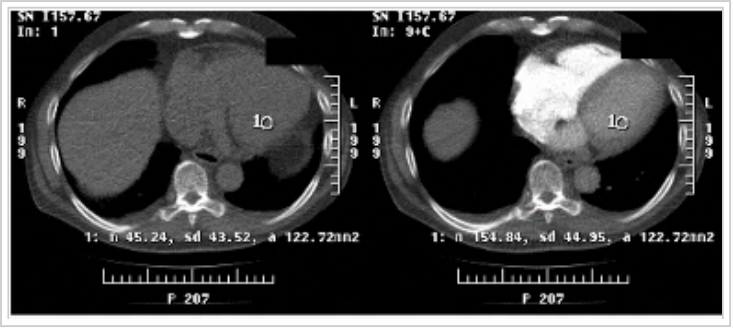
Field of View

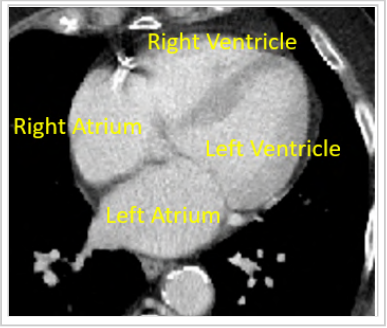
As small as possible to a minimum of 32 cm, while still including entire lungs (can clip subcutaneous fat).

Scan Description

- Series 1 – PA and lateral scout
  - During inspiration breath-hold.
  - Coverage: Lower neck to mid-abdomen
- Series 2 – Non-contrast (only when ordered)
  - During inspiration breath-hold
  - Coverage: Lung apex to below the sma
- Series 3 – CTA
  - Use smartprep with 6 s diagnostic delay, with ROI on Left Ventricle
  - During inspiration breath-hold
  - Coverage: Same as non-contrast scan







Reformat Instructions

Perform a manual reformat for the axial MIP. The CO and SA reformats are set-up for DMPR.

Also perform a retro recon of the chest 35-50% at 5% intervals. Slice thickness 1.25 mm in standard.

In the United States, CT Angiography CPT codes require the performance and documentation of 3D angiographic rendering, which may include maximum intensity projection (MIP), volumetric rendering, and/or surface rendering techniques.

Reformats

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
MIPS	THIN ST	Manual	MIP	1500/-700	10	5	axial
SA	LUNG	DMPR	Average	1500/-700	2.5	1.25	sagittal Include the spine and sternum.
CO	LUNG	DMPR	Average	1500/-700	2.5	1.25	coronal Include the spine and sternum.

Networking

- Send the entire study to PACS (ALI_Store) including the Dose Information Slide.
- Send the CTA series to CTAW1/ 3D lab.
- Note: if smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

Miscellaneous

None

Acquisition Parameters

Series 1, Scout

	Small	Medium	Large
Scout 1 kV	100	120	140
Scout 1 mA	10	10	10
Scout 1 Angle	180	180	180
Scout 2 kV	100	120	140
Scout 2 mA	40	40	80
Scout 2 Angle	90	90	90
WW/WL for Scout	500/50	500/50	500/50

Series 2, Scan Phase

	Small	Medium	Large
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**40**	**40**	**40**
Detector Rows	**64.0**	**64.0**	**64.0**
Detector Configuration	**64x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Large Body**	**Large Body**	**Large Body**
Pitch	**1.375**	**1.375**	**1.375**
Speed (mm/rot)	**55.00**	**55.00**	**55.00**
Rotation Time (s)	**0.7**	**0.7**	**1**
kV	**100**	**120**	**140**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(30-450)**	**(30-560)**	**(25-490)**
Manual mA	**220.0**	**280.0**	**300.0**
Noise Index	**28.5**	**36.0**	**45.5**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Series 2, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**30% / 20% / Medium**	**30% / 20% / Medium**	**30% / 10% / Medium**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Series 3, Smart Prep

	Small	Medium	Large
mA	**40**	**40**	**40**
Monitoring Delay (sec)	**4**	**4**	**4**
Monitoring ISD (sec)	**2.5**	**2.5**	**2.5**
Enhancement Threshold (HU)	**50**	**50**	**50**
Diagnostic Delay	**6**	**6**	**6**

Series 3, Scan Phase

	Small	Medium	Large
Scan Type	**Cardiac**	**Cardiac**	**Cardiac**
Cardiac Mode	**Snap Shot Segment (Helical)**	**Snap Shot Segment (Helical)**	**Snap Shot Segment (Helical)**
Beam Collimation	**40**	**40**	**40**
Scan FOV	**Large Cardiac**	**Large Cardiac**	**Large Cardiac**
Rotation Time (s)	**0.35**	**0.35**	**0.35**
kV	**80**	**100**	**120**
AEC Type	**ECG Modulated**	**ECG Modulated**	**ECG Modulated**
mA Range	**(100-400)**	**(120-500)**	**(150-600)**
Start-End Phase	**65-85**	**65-85**	**65-85**
R-Peak Delay(%)	**70%**	**70%**	**70%**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Series 3, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**450/50**	**450/50**	**450/50**
Recon Option	**Snap shot segment**	**Snap shot segment**	**Snap shot segment**
Recon Option	**None**	**None**	**None**
ASiR/ASiR256/DLIR	**30% / 10% / Medium**	**30% / 10% / Medium**	**30% / 10% / Medium**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**
Recon 2 (Secondary)			
DFOV	**30**	**40**	**50**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**1500/-700**	**1500/-700**	**1500/-700**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**	**None**	**None**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Series 4, Scan Phase

	Small	Medium	Large
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**40**	**40**	**40**
Detector Rows	**64.0**	**64.0**	**64.0**
Detector Configuration	**64x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Large Body**	**Large Body**	**Large Body**
Pitch	**0.516**	**0.516**	**0.516**
Speed (mm/rot)	**20.60**	**20.60**	**20.60**
Rotation Time (s)	**0.6**	**0.5**	**0.5**
kV	**80**	**100**	**120**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(20-340)**	**(20-440)**	**(25-520)**
Manual mA	**170.0**	**220.0**	**310.0**
Noise Index	**32.5**	**39.5**	**48.0**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Series 4, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**30% / 20% / Medium**	**30% / 20% / Medium**	**30% / 20% / Medium**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Gated Chest and Non-Gated Abd/Pelvis CTA 5.34/5.35/5.36

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Indication

Known or suspected type A aortic dissection with possible involvement of aortic valve and/or coronary arteries, extending into abdomen/pelvis. Patients should be 50 years or older. If younger, permission from radiologist is required.

Guidelines for using this protocol: (Note, please consult the protocolling radiologist if you have any questions on this protocol's use or if the order appears to not meet the criteria below.)

1. These studies require a non-contrast series first:
   - Acute aorta
     - Aortic dissection
     - Intramural hematoma
     - Penetrating atherosclerotic ulcer
   - Post-operative aorta
     - Endovascular repair (EVAR, TEVAR, FEVAR, PEVAR)
     - Open repair
2. These studies only require a single series: In the event that a non-contrast aneurysm evaluation is ordered, please skip the without series and **scan using the CTA series** in order to take advantage of higher dose.
   - Aortic aneurysm
     - Initial evaluation
     - Follow-up

Oral Contrast

None

Pre-Scan Instructions

- Tilt Gantry to S10,then back to zero, when it gets back to zero press both tilt buttons at the same time to "reset" the scanner.
- Practice Breathing Instructions. Ask patient to cough just prior to the scan.

IV Contrast Parameters 350

Select Ulrich protocols 66-68

Weight Ranges	Contrast Dosage	Injection Rate
<200 lbs. (<90 kg)	106 mL of Iohexol 350 mgI/mL + 50 mL NaCl flush	5 mL/sec
200-300 lbs (90-136 kg)	132 mL oflohexol 350 mgI/mL + 50 mL NaCl flush	5.5 mL/sec
>300 lbs (>136 kg)	159 mL of Iohexol 350 mgI/mL + 50 mL NaCl flush	6 mL/sec
18 G Antecubital IV Started in the Right Arm		

IV Contrast Parameters 300/370

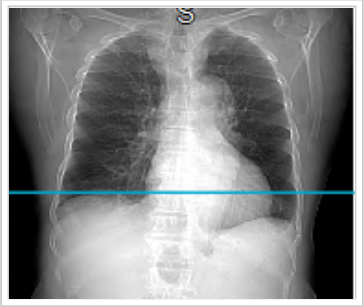
Weight Ranges	Contrast Dosage	Injection Rate
<200 lbs. (<90 kg)	100 mL of Iopamidol 370 mgI/mL (Isovue) + 50 mL NaCl flush	5 mL/sec
200-300 lbs (90-136 kg)	125 mL of Iopamidol 370 mgI/mL (Isovue) + 50 mL NaCl flush	5.5 mL/sec
>300 lbs (>136 kg)	150 mL of Iopamidol 370 mgI/mL (Isovue) + 50 mL NaCl flush	6 mL/sec
18 G Antecubital IV Started in the Right Arm		

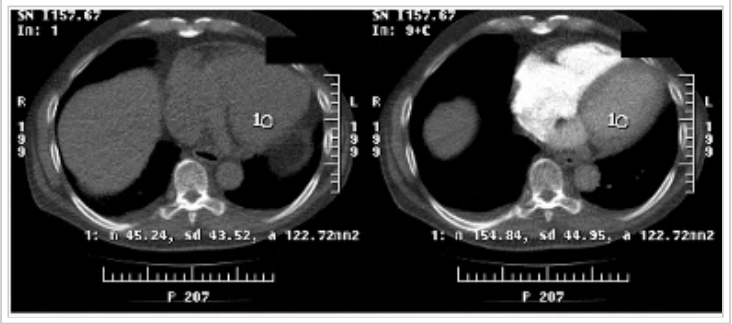
Field of View

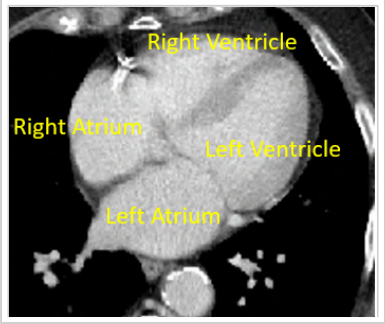
As small as possible to a minimum of 32 cm, while still including entire lungs (can clip subcutaneous fat).

Scan Description

- **Series 1** – PA and lateral scout
  - During inspiration breath-hold.
  - Coverage: Lower neck to mid thighs
- **Series 2** – Non-contrast (only when ordered)
  - During inspiration breath-hold
  - Coverage: Lung apex to lesser trochanters
- **Series 3** – CTA Coverage: Same as non-contrast scan. Scanned top down, and divided into 2 groups:
  - During inspiration breath-hold
- 1st Group: Gated chest
- 2nd Group: Non-gated abdomen/pelvis.
  - Prescribe the abdomen/pelvis to follow immediately after gated chest, with prescription contiguous with chest portion, and no overlap. To achieve this, never separate the two groups, only adjust scan coverage from top of chest group and bottom of A/P group. Turn breath-hold instructions off for the abdomen/pelvis portion and manually breathe.
  - Use smartprep with ROI on left ventricle







- **Series 4** (optional) – Delayed (FOR POST ENDOGRAFT ONLY)
  - Begin scan 2 min after beginning of contrast injection
  - During inspiration breath-hold
  - Coverage: Same as non-contrast scan

Reformat Instructions

Perform a manual reformat for the axial MIP. The CO and SA reformats are set-up for DMPR.

In the United States, CT Angiography CPT codes require the performance and documentation of 3D angiographic rendering, which may include maximum intensity projection (MIP), volumetric rendering, and/or surface rendering techniques.

Reformats

Name	Source Series Name	DMPR or Manual		Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
SA	THIN LUNG	non-Rev256: DMPR (Chest)	Rev256: Manual (Chest)	Average	1500/-700	2.5	1.25	sagittal
CO	THIN LUNG	non-Rev256: DMPR (Chest)	Rev256: Manual (Chest)	Average	1500/-700	2.5	1.25	coronal
Axial MIP	THIN ST	Manual		MIP	1500/-700	10	5	AX MIPS
SA CV	THIN ST	DMPR (Abd/Pelvis)		Average	450/50	3	2	sagittal
CO CV	THIN ST	DMPR (Abd/Pelvis)		Average	450/50	3	2	coronal

Networking

- Send the entire study to PACS (ALI_Store) including the Dose Information Slide.
- Send the CTA series to CTAW1/ 3D lab.
- Note: if smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

Miscellaneous

Give requisition to the 3D lab for processing.

Acquisition Parameters

Series 1, Scout

	Small	Medium	Large
Scout 1 kV	100	120	140
Scout 1 mA	10	10	10
Scout 1 Angle	180	180	180
Scout 2 kV	100	120	140
Scout 2 mA	40	40	80
Scout 2 Angle	90	90	90
WW/WL for Scout	500/50	500/50	500/50

Series 2, Scan Phase

	Small	Medium	Large
Scan Type	Helical	Helical	Helical
Beam Collimation	40	40	40
Detector Rows	64.0	64.0	64.0
Detector Configuration	64x0.625	64x0.625	64x0.625
Scan FOV	Large Body	Large Body	Large Body
Pitch	1.375	1.375	1.375
Speed (mm/rot)	55.00	55.00	55.00
Rotation Time (s)	0.7	0.7	1
kV	100	120	140
AEC type	smart mA	smart mA	smart mA
mA Range	(30-450)	(30-560)	(25-490)
Manual mA	220.0	280.0	300.0
Noise Index	28.5	36.0	45.5
Slice Thickness (mm)	1.25	1.25	1.25
Interval (mm)	0.625	0.625	0.625

Series 2, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**30% / 20% / Medium**	**30% / 20% / Medium**	**30% / 10% / Medium**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Series 3, Smart Prep

	Small	Medium	Large
mA	**40**	**40**	**40**
Monitoring Delay (sec)	**4**	**4**	**4**
Monitoring ISD (sec)	**2.5**	**2.5**	**2.5**
Enhancement Threshold (HU)	**80**	**80**	**80**
Diagnostic Delay	**Auto Minimum**	**Auto Minimum**	**Auto Minimum**

Series 3, Group 1, Scan Phase

	Small	Medium	Large
For all machines and Rev256 HR<70			
Scan Type	**Cardiac**	**Cardiac**	**Cardiac**
Cardiac Mode	**Snap Shot Segment (Helical)**	**Snap Shot Segment (Helical)**	**Snap Shot Segment (Helical)**
Beam Collimation	**40**	**40**	**40**
Scan FOV	**Large Cardiac**	**Large Cardiac**	**Large Cardiac**
Rotation Time (s)	**0.5**	**0.5**	**0.5**
kV	**80**	**100**	**120**
AEC Type	**ECG Modulated**	**ECG Modulated**	**ECG Modulated**
mA Range	**(80-320)**	**(100-390)**	**(100-450)**
Start-End Phase	**65-85**	**65-85**	**65-85**
R-Peak Delay(%)	**70%**	**70%**	**70%**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**
For Rev256 HR>70 only			
Scan Type	**Cardiac**	**Cardiac**	**Cardiac**
Cardiac Mode	**Snap Shot Segment (Helical)**	**Snap Shot Segment (Helical)**	**Snap Shot Segment (Helical)**
Beam Collimation	**40**	**40**	**40**
Scan FOV	**Large Cardiac**	**Large Cardiac**	**Large Cardiac**
Rotation Time (s)	**0.5**	**0.5**	**0.5**
kV	**80**	**100**	**120**
AEC Type	**ECG Modulated**	**ECG Modulated**	**ECG Modulated**
mA Range	**(80-320)**	**(100-390)**	**(100-450)**
Start-End Phase	**65-85**	**65-85**	**65-85**
R-Peak Delay(%)	**70%**	**70%**	**70%**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Series 3, Group 1 Recons

	Small	Medium	Large
Recon 1 (Primary) HR<70			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**450/50**	**450/50**	**450/50**
Recon Option	**Snap shot segment**	**Snap shot segment**	**Snap shot segment**
Recon Option	**None**	**None**	**None**
ASiR/ASiR256/DLIR	**30% / 10% / Medium**	**30% / 10% / Medium**	**30% / 10% / Medium**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**
Recon 2 (Secondary) HR<70			
DFOV	**30**	**40**	**50**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**1500/-700**	**1500/-700**	**1500/-700**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**	**None**	**None**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**
Recon 3 (Secondary) (HR>70)			
DFOV	HR>70 Rev256 Only	HR>70 Rev256 Only	HR>70 Rev256 Only
Recon Type			
WW/WL			
Recon Option			
Recon Option			
ASiR/ASiR256/DLIR			
Slice Thickness (mm)			
Interval (mm)			
Recon 4 (Secondary) (HR>70)			
DFOV	HR>70 Rev256 Only	HR>70 Rev256 Only	HR>70 Rev256 Only
Recon Type			
WW/WL			
Recon Option			
Recon Option			
ASiR/ASiR256/DLIR			
Slice Thickness (mm)			
Interval (mm)			

Series 3, Group 2, Scan Phase

	Small	Medium	Large
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**40**	**40**	**40**
Detector Rows	**64.0**	**64.0**	**64.0**
Detector Configuration	**64x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Large Body**	**Large Body**	**Large Body**
Pitch	**0.516**	**0.516**	**0.516**
Speed (mm/rot)	**20.60**	**20.60**	**20.60**
Rotation Time (s)	**0.4**	**0.4**	**0.4**
kV	**80**	**100**	**120**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(45-400)**	**(45-480)**	**(40-560)**
Manual mA	**400**	**440.0**	**550.0**
Noise Index	**22.0**	**34.0**	**41.5**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Series 3, Group 2, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**30% / 20% / Medium**	**30% / 20% / Medium**	**30% / 20% / Medium**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Series 4, Scan Phase

	Small	Medium	Large
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**40**	**40**	**40**
Detector Rows	**64.0**	**64.0**	**64.0**
Detector Configuration	**64x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Large Body**	**Large Body**	**Large Body**
Pitch	**0.516**	**0.516**	**0.516**
Speed (mm/rot)	**20.60**	**20.60**	**20.60**
Rotation Time (s)	**0.6**	**0.5**	**0.5**
kV	**80**	**100**	**120**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(20-340)**	**(20-440)**	**(25-520)**
Manual mA	**170.0**	**220.0**	**310.0**
Noise Index	**32.5**	**39.5**	**48.0**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Series 4, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**30% / 20% / Medium**	**30% / 20% / Medium**	**30% / 20% / Medium**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

DLIR Limitations:

1. DLIR is not available on the Primary Recon.
2. DLIR is only compatible with the Standard Algorithm. So, in instances where the primary recon is Soft algorithm,(i.e. many Neuro Protocols) the subsequent recons will be in Standard Algorithm to enable DLIR. The slight difference between the Soft and Standard Algorithms is outweighed by the improvement in image quality with DLIR enabled.
3. DLIR requires an interval exactly half of the slice thickness.
4. DLIR doesn't allow an interval of 0.312 mm. So, if you are on a DLIR enabled scanner, the thin 0.625 recon will be at 0.625x0.625 mm. On all other scanners the thin recon will be at 0.625x0.312 mm.

Prospectively-Gated Coronary CTA 5.37/5.38/5.39

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Indication

For imaging of the coronaries. Heart rate guidelines: HR<65 use prospective protocol, HR 65-75 use retrospective protocol, HR over 75 do not scan and consult physician.

Oral Contrast

None

Pre-Scan Instructions

- Tilt Gantry to S10,then back to zero, when it gets back to zero press both tilt buttons at the same time to "reset" the scanner.
- Practice Breathing Instructions. Ask patient to cough just prior to the scan.

IV Contrast Parameters 350

Select Ulrich protocols 69-71

Timing bolus:

- 11 mL of Iohexol 350 mgI/mL injection at a rate of 5 mL/sec
- 50 mL of NaCl flush at a rate of 5 mL/sec
- Enter timing bolus delay in the prep group delay on the scanner.

Coronary:

Weight Ranges	Contrast Dosage	Injection Rate
<200 lbs (<90 kg)	79 mL of Iohexol 350 mgI/mL + 50 mL NaCl flush	5 mL/sec
200-300 lbs (90-136 kg)	106 mL of Iohexol 350 mgI/mL + 50 mL NaCl flush	5 mL/sec
>300 lbs (>136 kg)	132 mL of Iohexol 350 mgI/mL + 50 mL NaCl flush	5.5 mL/sec

IV Contrast Parameters 300/370

Timing bolus:

- 10 mL of Iopamidol 370 mgI/mL (Isovue) injection at a rate of 5 mL/sec
- 50 mL of NaCl flush at a rate of 5 mL/sec
- Enter timing bolus delay in the prep group delay on the scanner.

Coronary:

Weight Ranges	Contrast Dosage	Injection Rate
<200 lbs (<90 kg)	75 mL of Iopamidol 370 mgI/mL (Isovue) + 50 mL NaCl flush	5 mL/sec
200-300 lbs (90-136 kg)	100 mL of Iopamidol 370 mgI/mL (Isovue) + 50 mL NaCl flush	5 mL/sec
>300 lbs (>136 kg)	125 mL of Iopamidol 370 mgI/mL (Isovue) + 50 mL NaCl flush	5.5 mL/sec

Field of View

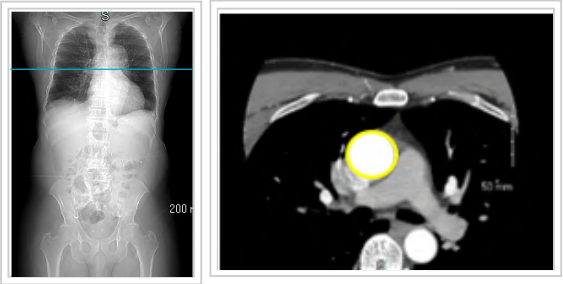
25 cm

Scan Description

- **Series 1**- PA and Lateral Scout
  - Coverage: Lower Neck to Below lung Base

- **Series 2**- Non - Contrast – Calcium Score
  - Coverage: Carina to below heart

- **Series 3** – Timing Bolus - On the ascending aorta



-
  - Use 10 ml of Iodixanol and 50 ml of saline at 6 ml/sec
  - Take 16sec + Bolus time = Prep delay
  - 16 seconds includes the 12 seconds of breathing instructions PLUS a phantom 4 seconds. Add the 16 to your MROI peak and that is your Timing Bolus Time/ Prep Group Delay.
  - If the timing for the Prep Group Delay is less that 20 seconds, please change the prep group to 20 seconds. We do not want to use anything less than 20 seconds for a delay.

- **Series 4** – CTA
  - Use Timing Bolus time for Prep Group Delay
  - Coverage: Same as non - contrast scan
  - Number 13/Cardiac breathing instructions are programmed (10 s breath in and out + 4 s pause). Can be adjusted per Radiologist/ Cardiologist discretion.
  - Please Record the Heart Rate prior to scanning

Click on the "Record" button within this widget

Reformat Instructions

- Non Revolution CT (Rev 256) Scanners
  - Using the CTA series, retro recon the entire scan range in 5% intervals. To find the range of phases acquired, use the Earliest Start and Latest End. Enter closest number (must be multiple of 5) Example: Earliest Start is 58, Latest End is 83, then enter 60 - 80 @ interval of 5%. Re-label your series description to 60- 80% (or whatever the scan range will allow) and confirm.
  - Please also retro recon the CTA series with the largest DFOV, bone, WW/WL 1500/-700, 0.625 mm thick, ASiR/ASiR-V set to 0% or none. You will need to enter just one phase to retro your lung series. Select a phase in the middle of the acquired range. Say, 70 - 70 @ 0% interval.

    - Using our routine chest reformats, perform a manual axial MIP, CO and SA reformat.
- Revolution CT (Rev 256) Scanners
    - The MIP reformat is built but is not set to auto run, it will need to be manually set-up in order to open the FOV to include as much of the lungs as possible. You may need to adjust the ww/wl.
    - The CO and SA reformat are set up using DMPR and will auto run.

In the United States, CT Angiography CPT codes require the performance and documentation of 3D angiographic rendering, which may include maximum intensity projection (MIP), volumetric rendering, and/or surface rendering techniques.

Reformats

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
MIPS	THIN ST	Manual	MIP	1500/-700	10	5	axial
SA	LUNG	Manual	Average	1500/-700	2.5	1.25	sagittal Include the spine and sternum.
CO	LUNG	Manual	Average	1500/-700	2.5	1.25	coronal Include the spine and sternum.

Networking

- All images are sent to PACS (ALI_Store).
- Note: if smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

Miscellaneous

- Always make sure patients heart rate is below 65 before coming over from Cardiology.
- Have nurse give sub-lingual Nitro right before scouts.
- If Cardiology and Radiology are going to read the scan, please make sure to spilt the exam in PACS or on the scanner and assign it to the CV reading room. Send the entire exam to CTA Coronary and send AT LEAST the scouts, lung recon, and reformats to Chest limited. (Some find it easier to duplicate and split the entire exam to the Chest Limited, CV rads have no preference.)

Acquisition Parameters

Series 1, Scout

	Small	Medium	Large
Scout 1 kV	100	120	140
Scout 1 mA	10	20	40
Scout 1 Angle	180	180	180
Scout 2 kV	100	120	140
Scout 2 mA	10	20	40
Scout 2 Angle	90	90	90
WW/WL for Scout	500/50	500/50	500/50

Series 2, Scan Phase

	Small	Medium	Large
Scan Type	**Cine**	**Cine**	**Cine**
Cardiac Mode	**Segment**	**Segment**	**Segment**
Beam Collimation	**20**	**20**	**20**
Scan FOV	**Large Body**	**Large Body**	**Large Body**
Rotation Time (s)	**0.35**	**0.35**	**0.35**
kV	**120**	**120**	**120**
AEC Type	**Manual mA**	**Manual mA**	**Manual mA**
mA Range	**(125-125)**	**(250-250)**	**(500-500)**
Smart Score Pro	**ON**	**ON**	**ON**
R-Peak Delay(%)	**70%**	**70%**	**70%**
Slice Thickness (mm)	**2.5**	**2.5**	**2.5**
Interval (mm)	**20**	**20**	**20**

Series 2 Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**25**	**25**	**25**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**450/50**	**450/50**	**450/50**
Recon Option	**Segment**	**Segment**	**Segment**
Recon Option			
ASiR/ASiR256/DLIR	**30%**	**30%**	**30%**
Slice Thickness (mm)	**2.5**	**2.5**	**2.5**
Interval (mm)	**20**	**20**	**20**

Bolus Tracking

For non Revolution CT (Rev 256), do a timing bolus. For Revolution CT (Rev 256) use the following:

	Small	Medium	Large
mA	**40**	**40**	**40**
Monitoring Delay (sec)	**7.0**	**7.0**	**7.0**
Monitoring ISD (sec)	**1.0**	**1.0**	**1.0**
Enhancement Threshold (HU)	**150**	**150**	**100**
Diagnostic Delay	**Auto Minimum**	**Auto Minimum**	**Auto Minimum**

Series 3, Scan Phase

	Small	Medium	Large
Scan Type	**Cardiac**	**Cardiac**	**Cardiac**
Cardiac Mode	**Snap Shot Pulse (Cine)**	**Snap Shot Pulse (Cine)**	**Snap Shot Pulse (Cine)**
Beam Collimation	**40**	**40**	**40**
Scan FOV	**Large Cardiac**	**Large Cardiac**	**Large Cardiac**
Rotation Time (s)	**0.35**	**0.35**	**0.35**
kV	**80**	**100**	**120**
mA	**400**	**480**	**560**
Padding Override	**ON**	**ON**	**ON**
Cardiac Gating	**ON**	**ON**	**ON**
R-Peak Delay(%)	**70%**	**70%**	**70%**
Adaptive Gating	**ON**	**ON**	**ON**
Max #Beats to Avoid	**2**	**2**	**2**
Slice Thickness (mm)	**0.625**	**0.625**	**0.625**

Series 3, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**25**	**25**	**25**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**450/50**	**450/50**	**450/50**
Recon Option	**Snap Shot Segment**	**Snap Shot Segment**	**Snap Shot Segment**
Recon Option			
ASiR/ASiR256/DLIR	**60% / 60%**	**60% / 60%**	**60% / 60%**
Slice Thickness (mm)	**0.625**	**0.625**	**0.625**
Interval (mm)	**n/a**	**n/a**	**n/a**
Recon 2 (Secondary)			
DFOV	Retro for lungs	Retro for lungs	Retro for lungs
Recon Type			
WW/WL			
Recon Option			
Recon Option			
ASiR/ASiR256/DLIR			
Slice Thickness (mm)			
Interval (mm)			
Recon 3 (Secondary) (Rev256 Only)			
DFOV	Snap Shot Freeze (option)	Snap Shot Freeze (option)	Snap Shot Freeze (option)
Recon Type			
WW/WL			
Recon Option			
Recon Option			
ASiR/ASiR256/DLIR			
Slice Thickness (mm)			
Interval (mm)			
Recon 4 (Secondary) (Rev256 Only)			
DFOV	Rev256 only Recon	Rev256 only Recon	Rev256 only Recon
Recon Type			
WW/WL			
Recon Option			
Recon Option			
ASiR/ASiR256/DLIR			
Slice Thickness (mm)			
Interval (mm)			
Recon 5 (Secondary) (Rev256 Only)			
DFOV	Rev256 only Recon	Rev256 only Recon	Rev256 only Recon
Recon Type			
WW/WL			
Recon Option			
Recon Option			
ASiR/ASiR256/DLIR			
Slice Thickness (mm)			
Interval (mm)			

Retrospectively-Gated Coronary CTA 5.40/5.41/5.42

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Indication

For imaging of the coronaries. Heart rate guidelines: HR<65 use prospective protocol, HR 65-75 use retrospective protocol, HR over 75 do not scan and consult physician.

Oral Contrast

None

Pre-Scan Instructions

- Tilt Gantry to S10,then back to zero, when it gets back to zero press both tilt buttons at the same time to "reset" the scanner.
- Practice Breathing Instructions. Ask patient to cough just prior to the scan.

IV Contrast Parameters 350

Select Ulrich protocols 69-71

Timing bolus:

- 11 mL of Iohexol 350 mgI/mL injection at a rate of 5 mL/sec
- 50 mL of NaCl flush at a rate of 5 mL/sec
- Enter timing bolus delay in the prep group delay on the scanner.

Coronary:

Weight Ranges	Contrast Dosage	Injection Rate
<200 lbs (<90 kg)	79 mL of Iohexol 350 mgI/mL + 50 mL NaCl flush	5 mL/sec
200-300 lbs (90-136 kg)	106 mL of Iohexol 350 mgI/mL + 50 mL NaCl flush	5 mL/sec
>300 lbs (>136 kg)	132 mL of Iohexol 350 mgI/mL + 50 mL NaCl flush	5.5 mL/sec

IV Contrast Parameters 300/370

Timing bolus:

- 10 mL of Iopamidol 370 mgI/mL (Isovue) injection at a rate of 5 mL/sec
- 50 mL of NaCl flush at a rate of 5 mL/sec
- Enter timing bolus delay in the prep group delay on the scanner.

Coronary:

Weight Ranges	Contrast Dosage	Injection Rate
<200 lbs (<90 kg)	75 mL of Iopamidol 370 mgI/mL (Isovue) + 50 mL NaCl flush	5 mL/sec
200-300 lbs (90-136 kg)	100 mL of Iopamidol 370 mgI/mL (Isovue) + 50 mL NaCl flush	5 mL/sec
>300 lbs (>136 kg)	125 mL of Iopamidol 370 mgI/mL (Isovue) + 50 mL NaCl flush	5.5 mL/sec

Field of View

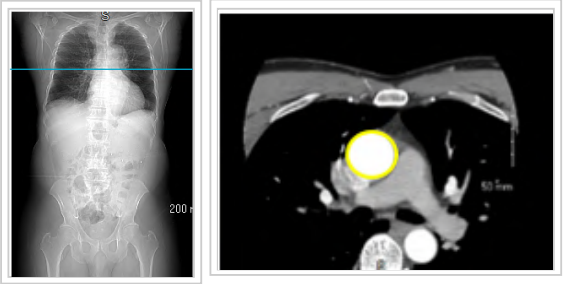
25 cm

Scan Description

- **Series 1**- PA and Lateral Scout
  - Coverage: Lower Neck to Below lung Base

- **Series 2**- Non - Contrast – Calcium Score
  - Coverage: Carina to below heart

- **Series 3** – Timing Bolus - On the ascending aorta



-
  - Use 10 ml of Iodixanol and 50 ml of saline at 6 ml/sec
  - Take 16sec + Bolus time = Prep delay
  - 16 seconds includes the 12 seconds of breathing instructions PLUS a phantom 4 seconds. Add the 16 to your MROI peak and that is your Timing Bolus Time/ Prep Group Delay.
  - If the timing for the Prep Group Delay is less that 20 seconds, please change the prep group to 20 seconds. We do not want to use anything less than 20 seconds for a delay.

- **Series 4** – CTA
  - Use Timing Bolus time for Prep Group Delay
  - Coverage: Same as non - contrast scan
  - Number 13/Cardiac breathing instructions are programmed (10 s breath in and out + 4 s pause). Can be adjusted per Radiologist/ Cardiologist discretion.
  - Please Record the Heart Rate prior to scanning

Click on the "Record" button within this widget

Reformat Instructions

Cardiac Recons:

- Click on RX (in the top rt corner) to choose % interval.
- Do 65%-75% at 5% interval. Slice thickness 0.6 mm in standard (for both series).
- Do 5%-95% at 10% interval AND 35-50% at 5%. Slice thickness 1.25 mm in standard (**for the retrospective scans only**).
- Ask whoever is monitoring case what they would like for other recons.

Perform a manual reformat for the axial MIP. The CO and SA reformats are set-up for DMPR.

In the United States, CT Angiography CPT codes require the performance and documentation of 3D angiographic rendering, which may include maximum intensity projection (MIP), volumetric rendering, and/or surface rendering techniques.

Reformats

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
MIPS	THIN ST	Manual	MIP	1500/-700	10	5	axial
SA	LUNG	DMPR	Average	1500/-700	2.5	1.25	sagittal Include the spine and sternum.
CO	LUNG	DMPR	Average	1500/-700	2.5	1.25	coronal Include the spine and sternum.

Networking

- All images are sent to PACS (ALI_Store).
- Send CTA to CTAW1/3D Lab.
- Note: if smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

Miscellaneous

- Always make sure patients heart rate is below 65 before coming over from Cardiology.
- Have nurse give sub-lingual Nitro right before scouts.
- If Cardiology and Radiology are going to read the scan, please make sure to spilt the exam in PACS or on the scanner and assign it to the CV reading room. Send the entire exam to CTA Coronary and send AT LEAST the scouts, lung recon, and reformats to Chest limited. (Some find it easier to duplicate and split the entire exam to the Chest Limited, CV rads have no preference.)

Acquisition Parameters

Series 1, Scout

	Small	Medium	Large
Scout 1 kV	100	120	140
Scout 1 mA	10	10	10
Scout 1 Angle	180	180	180
Scout 2 kV	100	120	140
Scout 2 mA	40	40	80
Scout 2 Angle	90	90	90
WW/WL for Scout	500/50	500/50	500/50

Series 2, Scan Phase

	Small	Medium	Large
Scan Type	**Cine**	**Cine**	**Cine**
Cardiac Mode	**Segment**	**Segment**	**Segment**
Beam Collimation	**20**	**20**	**20**
Scan FOV	**Large Body**	**Large Body**	**Large Body**
Rotation Time (s)	**0.35**	**0.35**	**0.35**
kV	**120**	**120**	**120**
AEC Type	**Manual mA**	**Manual mA**	**Manual mA**
mA Range	**(125-125)**	**(250-250)**	**(500-500)**
Smart Score Pro	**ON**	**ON**	**ON**
R-Peak Delay(%)	**70%**	**70%**	**70%**
Slice Thickness (mm)	**2.5**	**2.5**	**2.5**
Interval (mm)	**20**	**20**	**20**

Series 2, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**25**	**25**	**25**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**450/50**	**450/50**	**450/50**
Recon Option	**Segment**	**Segment**	**Segment**
Recon Option			
ASiR/ASiR256/DLIR	**30%**	**30%**	**30%**
Slice Thickness (mm)	**2.5**	**2.5**	**2.5**
Interval (mm)	**20**	**20**	**20**

Series 3, Timing Bolus

Timing Bolus

Series 4, Scan Phase

	Small	Medium	Large
Scan Type	**Cardiac**	**Cardiac**	**Cardiac**
Cardiac Mode	**Snap Shot Segment (Helical)**	**Snap Shot Segment (Helical)**	**Snap Shot Segment (Helical)**
Beam Collimation	**40**	**40**	**40**
Scan FOV	**Large Cardiac**	**Large Cardiac**	**Large Cardiac**
Rotation Time (s)	**0.35**	**0.35**	**0.35**
kV	**80**	**100**	**120**
AEC Type	**ECG Modulated**	**ECG Modulated**	**ECG Modulated**
mA Range	**(100-400)**	**(120-480)**	**(150-560)**
Start-End Phase	**65-85**	**65-85**	**65-85**
R-Peak Delay(%)	**70%**	**70%**	**70%**
Slice Thickness (mm)	**0.625**	**0.625**	**0.625**
Interval (mm)	**0.625**	**0.625**	**0.625**

Note: the interval in the table above does not match the table below, the correct interval is 0.4 mm as stated in the table below. This will ensure equal slice thickness and overlap between the prospective and retrospective gated coronary CTA protocols.

Series 4, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**25**	**25**	**25**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**450/50**	**450/50**	**450/50**
Recon Option	**Snap Shot Segment**	**Snap Shot Segment**	**Snap Shot Segment**
Recon Option			
ASiR/ASiR256/DLIR	**60% / 30% / High**	**60% / 30% / High**	**60% / 30% / High**
Slice Thickness (mm)	**0.625**	**0.625**	**0.625**
Interval (mm)	**0.4**	**0.4**	**0.4**
Recon 2 (Secondary)			
DFOV	**30**	**40**	**50**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**1500/-700**	**1500/-700**	**1500/-700**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**	**None**	**None**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

TAVI CTA 5.43/5.44/5.45

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Indication

- Pre scan before a TAVI procedure.
- Please scan the exam using the CT Heart Morphology order.
- If the order is for a "valve-in-valve" you only need to scan the gated chest, skip the CAP portion of the exam.
- If the scan is ordered without contrast use the non-gated Chest/Abdomen/Pelvis protocol #5.28,5.29,5.30. Use the without series, create an additional lung recon and perform the chest reformats.

Oral Contrast

None

Pre-Scan Instructions

Note, 64/128 slice scanner are preferred for this indication, preferably Revolution CT (Rev 256) or the Revolution Frontier™, Revolution Frontier™ ES, Revolution™ Discovery™ CT, or Discovery™ CT750 HD scanner line.

For Non- Revolution CT (Rev 256) tilt gantry to S10, then back to zero, when it gets back to zero press both tilt buttons at the same time to "reset" the scanner.

Patient will be scanned with arms up. Practice breathing instructions. Remind the patient not to bear down. On Non-Revolution CT (Rev 256) you MUST manually breath the patient.

IV Contrast Parameters 350

Select Ulrich protocols 72-74

Weight Ranges	Contrast Dosage	Injection Rate
<200 lbs. (<90 kg)	106 mL of Iohexol 350 mgI/mL + 50 mL NaCl flush	5 mL/sec
200-300 lbs (90-136 kg)	132 mL of Iohexol 350 mgI/mL + 50 mL NaCl flush	5.5 mL/sec
>300 lbs (>136 kg)	159 mL of Iohexol 350 mgI/mL + 50 mL NaCl flush	6 mL/sec
18 G Antecubital IV Started in the Right Arm		

IV Contrast Parameters 300/370

Weight Ranges	Contrast Dosage	Injection Rate
<200 lbs. (<90 kg)	100 mL of Iopamidol 370 mgI/mL (Isovue) + 50 mL NaCl flush	5 mL/sec
200-300 lbs (90-136 kg)	125 mL of Iopamidol 370 mgI/mL (Isovue) + 50 mL NaCl flush	5.5 mL/sec
>300 lbs (>136 kg)	150 mL of Iopamidol 370 mgI/mL (Isovue) + 50 mL NaCl flush	6 mL/sec
18 G Antecubital IV Started in the Right Arm		

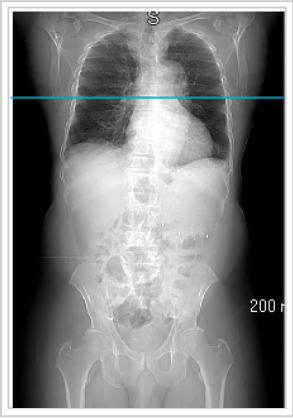
Field of View

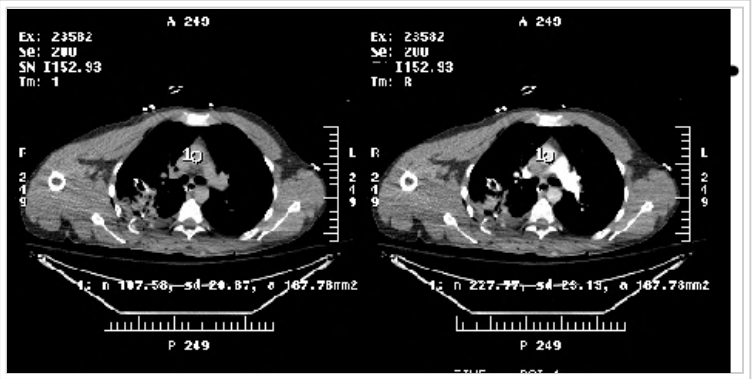
30cm (Small Adult), 40cm (Medium Adult), 50cm (Large Adult)

Scan Description

- Series 1 – PA and lateral scout
  - Ask patient to stop breathing.
  - Coverage: Lower neck to symphysis pubis.
- Series 2 – CTA Coverage: Lung apices through lesser trochanters. Scanned top down and divided into 2 groups.
- 1st Group: Gated chest

- 2nd Group: Non-gated abdomen/pelvis
- NOTE: If the scan is ordered without contrast use the non-gated Chest/Abdomen/Pelvis protocol #5.28,5.29,5.30. Use the without series, create an additional lung recon and perform the chest reformats.
    - Prescribe the abdomen/pelvis to follow immediately after gated chest, with prescription contiguous with chest portion, and no overlap. **YOU MUST MANUALLY BREATHE THE PATIENT.** Ask patient to stop breathing. (Please DO NOT use auto breathing instructions, it causes a slight delay between groups, these auto instructions are "turned off" intentionally.)
    - Use smartprep with a minimum diagnostic delay, with ROI on ascending aorta at the level of the carina





- For Recon 2 5% to 95% you must cone down to just the heart. Just above the arch to the bottom of the heart in a 25 FOV. You cannot have more than 3000 images or it will not work for 3D.
- Recon 2 must be entered on the cardiac reconstruction screen and should be preprogrammed onto the scanner with the following parameters: no cardiac filter, 0.625 mm slice thickness, 0.625 mm interval, and reconstructed from 5% to 95% phase in 10 % steps.
- For Recon 3 35-65% (otherwise same as Recon 2) you must cone down to just the heart. Just above the arch to the bottom of the heart in a 25 FOV. You cannot have more than 3000 images or it will not work for 3D.
- Recon 3 must be entered on the cardiac reconstruction screen and should be preprogrammed onto the scanner with the following parameters: no cardiac filter, 0.625 mm slice thickness, 0.625 mm interval, and reconstructed from 35 to 65% phase in 10 % steps .

For patients with variable heart rates below 70BPM "Override the monitor heart rate"

When the heart rate varies by more than 10 BPM, the HR should be manually entered. To calculate what HR should be entered, use the table below. The override HR you enter will be the first number listed in the heart rate range group that is lower than your minimum heart rate observed.

For example, if a patient's HR varies from 53 to 66, the override HR should be in the 43-49 range. We always pick the smallest HR within the range, so you would enter 43 for the override HR.

Another example: If a patient's HR ranged from 45 to 57, you would enter 30 as the override HR as 30 is the smallest HR within the grouping below a HR of 45.

For the Revolution Frontier™, Revolution Frontier™ ES, Revolution™ Discovery™ CT, or Discovery™ CT750 HD scanner line and 4 cm LightSpeed VCT scanners

Heart rate range	Gantry speed	Pitch
30 to 42 BPM	**0.4 sec**	**0.18**
43 to 49 BPM	**0.4 sec**	**0.20**
50 to 59 BPM	**0.4 sec**	**0.23**
60 to 69 BPM	**0.4 sec**	**0.26**

For the Optima 660/Revolution Evo Scanners (Note, the Optima 660/Revolution Evo should not be used for TAVR scans if you have a Revolution CT or a Revolution Frontier™, Revolution Frontier™ ES, Revolution™ Discovery™ CT, or Discovery™ CT750 HD scanner)

Heart rate range	Gantry speed	Pitch
30 to 39 BPM	0.5 sec	0.2
40 to 49 BPM	0.5 sec	0.24
50 to 59 BPM	0.5 sec	0.3
60 to 74 BPM	0.5 sec	0.325

1. From the ViewEdit screen, view the BPM displayed on the Gating button.

2. From the CardIQ SnapShot screen, toggle Heart Rate Override On.

3. In the Heart Rate text field, type a minimum HR value that covers the lowest expected to occur during the scan (as described above) and press Enter. This insures a low enough pitch is used for the acquisition.

Reformat Instructions

Perform a manual reformat for the axial MIP. The CO and SA reformats are set-up for DMPR.

In the United States, CT Angiography CPT codes require the performance and documentation of 3D angiographic rendering, which may include maximum intensity projection (MIP), volumetric rendering, and/or surface rendering techniques.

Reformats

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
MIPS	THIN ST CTA	Manual	MIP	1700/-500	10	5	axial
SA CV	THIN ST	DMPR	Average	450/50	3	2	sagittal
CO CV	THIN ST	DMPR	Average	450/50	3	2	coronal

Networking

- Send the entire study to PACS (ALI_Store) including the Dose Information Slide and the smart prep image.
- Note: if smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

For CAD: Send the THIN LUNG recon to **ClearreadCT** (or your own's sites CAD vendor)

Miscellaneous

None

Acquisition Parameters

Series 1, Scout

	Small	Medium	Large
Scout 1 kV	100	120	140
Scout 1 mA	10	10	10
Scout 1 Angle	180	180	180
Scout 2 kV	100	120	140
Scout 2 mA	40	40	80
Scout 2 Angle	90	90	90
WW/WL for Scout	500/50	500/50	500/50

Series 2, Smart Prep

	Small	Medium	Large
mA	**40**	**40**	**40**
Monitoring Delay (sec)	**4**	**4**	**4**
Monitoring ISD (sec)	**2.5**	**2.5**	**2.5**
Enhancement Threshold (HU)	**80**	**80**	**80**
Diagnostic Delay	**Auto Minimum**	**Auto Minimum**	**Auto Minimum**

Series 2, Group 1, Scan Phase

	Small	Medium	Large
Scan Type	**Cardiac**	**Cardiac**	**Cardiac**
Cardiac Mode	**Snap Shot Segment (Helical)**	**Snap Shot Segment (Helical)**	**Snap Shot Segment (Helical)**
Beam Collimation	**40**	**40**	**40**
Scan FOV	**Large Cardiac**	**Large Cardiac**	**Large Cardiac**
Rotation Time (s)	**0.4**	**0.4**	**0.4**
kV	**80**	**100**	**120**
AEC Type	**ECG Modulated**	**ECG Modulated**	**ECG Modulated**
mA Range	**(400-400)**	**(480-480)**	**(560-560)**
Start-End Phase	**65-85**	**65-85**	**65-85**
R-Peak Delay(%)	**70%**	**70%**	**70%**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Series 2, Group 1 Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**450/50**	**450/50**	**450/50**
Recon Option	**Snap shot segment**	**Snap shot segment**	**Snap shot segment**
Recon Option	**None**	**None**	**None**
ASiR/ASiR256/DLIR	**30% / 10% / Medium**	**30% / 10% / Medium**	**30% / 10% / Medium**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**
Recon 2 (Secondary) (Rev256 Only)			
DFOV	5-95%	5-95%	5-95%
Recon Type			
WW/WL			
Recon Option			
Recon Option			
ASiR/ASiR256/DLIR			
Slice Thickness (mm)			
Interval (mm)			
Recon 3 (Secondary) (Rev256 Only)			
DFOV	35-65%	35-65%	35-65%
Recon Type			
WW/WL			
Recon Option			
Recon Option			
ASiR/ASiR256/DLIR			
Slice Thickness (mm)			
Interval (mm)			
Recon 4 (Secondary)			
DFOV	**30**	**40**	**50**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**1500/-700**	**1500/-700**	**1500/-700**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**	**None**	**None**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Series 2, Group 2, Scan Phase

	Small	Medium	Large
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**40**	**40**	**40**
Detector Rows	**64.0**	**64.0**	**64.0**
Detector Configuration	**64x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Large Body**	**Large Body**	**Large Body**
Pitch	**0.516**	**0.516**	**0.516**
Speed (mm/rot)	**20.60**	**20.60**	**20.60**
Rotation Time (s)	**0.4**	**0.4**	**0.4**
kV	**80**	**100**	**120**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(45-400)**	**(45-480)**	**(40-560)**
Manual mA	**400**	**440.0**	**550.0**
Noise Index	**22.0**	**34.0**	**41.5**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Series 2, Group 2, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**800/100**	**800/100**	**800/100**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**30% / 20% / Medium**	**30% / 20% / Medium**	**30% / 20% / Medium**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Prospectively-Gated CTA Chest (Non-Coronary) 5.46/5.47/5.48

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Indication

- < 70 bpm with regular heart rate = Prospectively Gated (70%)
- >70 bpm with regular heart rate = Prospectively Gated (35%)
- Irregular heart rate = Retrospectively Gated
- What constitutes an irregular heart rate? Anyone with a heart rate that varies more than 10 beats.

Evaluate for ascending aortic aneurysm, dissection, or injury. Evaluate cardiac or vascular abnormality without cardiac motion.

Guidelines for using this protocol: (Note, please consult the protocolling radiologist if you have any questions on this protocol's use or if the order appears to not meet the criteria below.)

1. These studies require a non-contrast series first:
   - Acute aorta
     - Aortic dissection
     - Intramural hematoma
     - Penetrating atherosclerotic ulcer
   - Post-operative aorta
     - Endovascular repair (EVAR, TEVAR, FEVAR, PEVAR)
     - Open repair
2. These studies only require a single series: In the event that a non-contrast aneurysm evaluation is ordered, please skip the without series and **scan using the CTA series** in order to take advantage of higher dose.
   - Aortic aneurysm
     - Initial evaluation
     - Follow-up

Video for this protocol

Oral Contrast

None

Pre-Scan Instructions

- Tilt Gantry to S10,then back to zero, when it gets back to zero press both tilt buttons at the same time to "reset" the scanner.
- Practice breathing instructions. Remind the patient not to bear down. Suspension breathing is turned on

IV Contrast Parameters 350

Weight Ranges	Contrast Dosage	Injection Rate
<200 lbs. (<90 kg)	106 mL of Iohexol 350 mgI/mL + 50 mL NaCl flush	5 mL/sec
200-300 lbs (90-136 kg)	132 mL of Iohexol 350 mgI/mL + 50 mL NaCl flush	5.5 mL/sec
>300 lbs (>136 kg)	159 mL of Iohexol 350 mgI/mL + 50 mL NaCl flush	6 mL/sec
18 G Antecubital IV Started in the Right Arm		

IV Contrast Parameters 300/370

Weight Ranges	Contrast Dosage	Injection Rate
<200 lbs. (<90 kg)	100 mL of Iopamidol 370 mgI/mL (Isovue) + 50 mL NaCl flush	5 mL/sec
200-300 lbs (90-136 kg)	125 mL of Iopamidol 370 mgI/mL (Isovue) + 50 mL NaCl flush	5.5 mL/sec
>300 lbs (>136 kg)	150 mL of Iopamidol 370 mgI/mL (Isovue) + 50 mL NaCl flush	6 mL/sec
18 G Antecubital IV Started in the Right Arm		

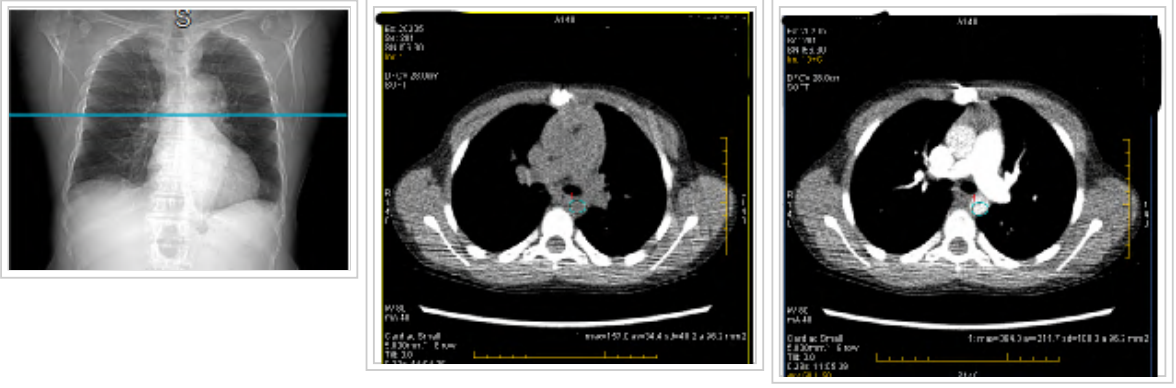
Field of View

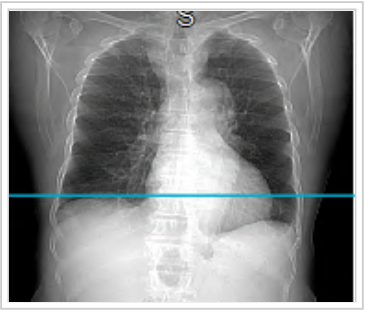
As small as possible to a minimum of 32 cm, while still including entire lungs (can clip subcutaneous fat).

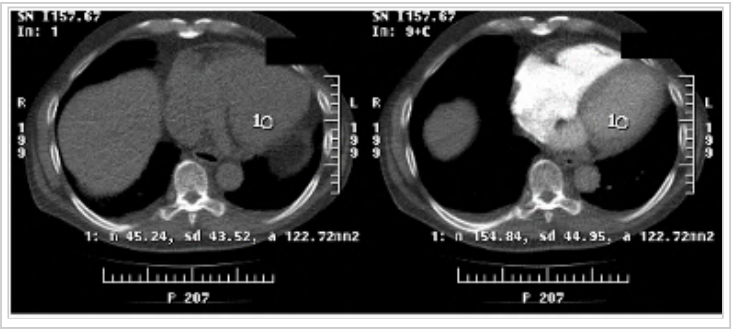
Scan Description

- **Series 1** – PA and lateral scout
  - Remind the patient not to bear down. Suspension breathing is turned on
  - Coverage: Mid abdomen to lower neck
- **Series 2** – Non-contrast (only when ordered) Scanned from just below diaphragm to just above lung apex. (Scanning bottom up)
- **Series 3** – CTA: Same as non-contrast scan.IF the Without series is skipped, make sure to switch the Start and End Location of your CTA to scan bottom up.
  - If heart rate is over 70 bpm please adjust gating window to 35%.

- **Smart Prep:**
  - Rev 256: Place ROI on the descending aorta. **Dynamic transition is turned on so the scan will progress without the need for you to hit 'scan phase'.**
  - Non Rev 256: Place ROI on left ventricle.
  - Ask the patient to “stop breathing”







Reformat Instructions

- Non Revolution CT (Rev 256) Scanners
  - Using the CTA series, retro recon the entire scan range in 5% intervals. To find the range of phases acquired, use the Earliest Start and Latest End. Enter closest number (must be multiple of 5) Example: Earliest Start is 58, Latest End is 83, then enter 60 - 80 @ interval of 5%. Re-label your series description to 60- 80% (or whatever the scan range will allow) and confirm.
  - Please also retro recon the CTA series with the largest DFOV, bone, WW/WL 1500/-700, 0.625 mm thick, ASiR/ASiR-V set to 0% or none. You will need to enter just one phase to retro your lung series. Select a phase in the middle of the acquired range. Say, 70 - 70 @ 0% interval.
  - Using our routine chest reformats, perform a manual axial MIP, CO and SA reformat.
- Revolution CT (Rev 256) Scanners
  - The MIP reformat is built but is not set to auto run, it will need to be manually set-up in order to open the FOV to include as much of the lungs as possible. You may need to adjust the ww/wl.
  - The CO and SA reformat are set up using DMPR and will auto run.

In the United States, CT Angiography CPT codes require the performance and documentation of 3D angiographic rendering, which may include maximum intensity projection (MIP), volumetric rendering, and/or surface rendering techniques.

Reformats

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
MIPS	THIN ST	Manual	MIP	1500/-700	10	5	axial
SA	LUNG	Manual	Average	1500/-700	2.5	1.25	sagittal Include the spine and sternum.
CO	LUNG	Manual	Average	1500/-700	2.5	1.25	coronal Include the spine and sternum.

Networking

- Send the entire study to PACS (ALI_Store) including the Dose Information Slide.
- Send the CTA series to CTAW1/ 3D lab.
- Note: if smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

Miscellaneous

Give requisition to the 3D lab for processing.

Acquisition Parameters

Series 1, Scout

	Small	Medium	Large
Scout 1 kV	**100**	**120**	**140**
Scout 1 mA	**10**	**10**	**10**
Scout 1 Angle	**180**	**180**	**180**
Scout 2 kV	**100**	**120**	**140**
Scout 2 mA	**40**	**40**	**80**
Scout 2 Angle	**90**	**90**	**90**
WW/WL for Scout	**500/50**	**500/50**	**500/50**

Series 2, Scan Phase

	Small	Medium	Large
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**40**	**40**	**40**
Detector Rows	**64.0**	**64.0**	**64.0**
Detector Configuration	**64x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Large Body**	**Large Body**	**Large Body**
Pitch	**1.375**	**1.375**	**1.375**
Speed (mm/rot)	**55.00**	**55.00**	**55.00**
Rotation Time (s)	**0.7**	**0.7**	**1**
kV	**100**	**120**	**140**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(30-450)**	**(30-560)**	**(25-490)**
Manual mA	**220.0**	**280.0**	**300.0**
Noise Index	**28.5**	**36.0**	**45.5**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Series 2, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**30% / 20% / Medium**	**30% / 20% / Medium**	**30% / 10% / Medium**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Series 3, Smart Prep

	Small	Medium	Large
mA	**40**	**40**	**40**
Monitoring Delay (sec)	**10**	**10**	**10**
Monitoring ISD (sec)	**1**	**1**	**1**
Enhancement Threshold (HU)	**120**	**120**	**120**
Diagnostic Delay	**Auto Minimum**	**Auto Minimum**	**Auto Minimum**

Series 3, Scan Phase

	Small	Medium	Large
For all machines and Rev256 HR<70			
Scan Type	**Cardiac**	**Cardiac**	**Cardiac**
Cardiac Mode	**Snap Shot Pulse (Cine)**	**Snap Shot Pulse (Cine)**	**Snap Shot Pulse (Cine)**
Beam Collimation	**40**	**40**	**40**
Scan FOV	**Large Cardiac**	**Large Cardiac**	**Large Cardiac**
Rotation Time (s)	**0.35**	**0.35**	**0.35**
kV	**80**	**100**	**120**
mA	**400**	**480**	**560**
Padding Override	**ON**	**ON**	**ON**
Cardiac Gating	**ON**	**ON**	**ON**
R-Peak Delay(%)	**70%**	**70%**	**70%**
Adaptive Gating	**ON**	**ON**	**ON**
Max #Beats to Avoid	**2**	**2**	**2**
Slice Thickness (mm)	**0.625**	**0.625**	**0.625**
For Rev256 HR>70			
Scan Type	**Cardiac**	**Cardiac**	**Cardiac**
Cardiac Mode	**Snap Shot Pulse (Cine)**	**Snap Shot Pulse (Cine)**	**Snap Shot Pulse (Cine)**
Beam Collimation	**40**	**40**	**40**
Scan FOV	**Large Cardiac**	**Large Cardiac**	**Large Cardiac**
Rotation Time (s)	**0.35**	**0.35**	**0.35**
kV	**80**	**100**	**120**
mA	**400**	**480**	**560**
Padding Override	**ON**	**ON**	**ON**
Cardiac Gating	**ON**	**ON**	**ON**
R-Peak Delay(%)	**70%**	**70%**	**70%**
Adaptive Gating	**ON**	**ON**	**ON**
Max #Beats to Avoid	**2**	**2**	**2**
Slice Thickness (mm)	**0.625**	**0.625**	**0.625**

Series 3 Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**25**	**25**	**25**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**450/50**	**450/50**	**450/50**
Recon Option	**Snap Shot Segment**	**Snap Shot Segment**	**Snap Shot Segment**
Recon Option			
ASiR/ASiR256/DLIR	**60% / 60%**	**60% / 60%**	**60% / 60%**
Slice Thickness (mm)	**0.625**	**0.625**	**0.625**
Interval (mm)	**n/a**	**n/a**	**n/a**
Recon 2 (Secondary)			
DFOV	**30**	**40**	**50**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**1500/-700**	**1500/-700**	**1500/-700**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**	**None**	**None**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Subclavian CT Venogram 5.55/5.56/5.57

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Indication

Evaluate the central veins in the upper chest and arms.

Oral Contrast

None

Pre-Scan Instructions

Arms must be down to visualize the upper arm veins. Practice breathing instructions. Remind the patient not to bear down.

IV Contrast Parameters 350

Select Ulrich protocol 75 *injection protocol under review

Syringe	Contrast Dosage	Injection Rate
Syringe 1 Load:	148 mL of Iohexol 350 mgI/mL	4 mL/sec
Syringe 2 Load:	11 mL of Iohexol 350 mgI/mL 90 mL of NaCl flush *Syringe 2 must be a 10% dilute solution*	3 mL/sec
18-20G IV started in the arm that the radiologist protocols.		

IV Contrast Parameters 300/370

Syringe	Contrast Dosage	Injection Rate
Syringe 1 Load:	140 mL of Iopamidol 370 mgI/mL (Isovue)	4 mL/sec
Syringe 2 Load:	10 mL of Iopamidol 370 mgI/mL (Isovue) 90 mL of NaCl flush *Syringe 2 must be a 10% dilute solution*	3 mL/sec
18-20G IV started in the arm that the radiologist protocols.		

Field of View

As small as possible to a minimum of 32 cm including arms in the field of view.

Scan Description

- Series 1 - PA and lateral scout centering at sternal notch
  - During inspiration breath-hold.
  - Coverage:
  - Chest: Lower neck to mid-abdomen
- Series 2 – CT Venogram
  - Use a 60 second delay
  - During inspiration breath-hold
  - Coverage: Mid heart to Mandible

Reformat Instructions

Manual reformats on recon 1, series 2.

In the United States, CT Angiography CPT codes require the performance and documentation of 3D angiographic rendering, which may include maximum intensity projection (MIP), volumetric rendering, and/or surface rendering techniques.

Reformats

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
AX	Thin ST	Manual	MIP	1700/-700	10	5	axial
CO	Thin ST	Manual	MIP	1700/-700	10	5	coronal
SA	Thin ST	Manual	MIP	1700/-700	10	5	sagittal

Networking

- Send the entire study to PACS (ALI_Store) and 3D Lab including the Dose Information Slide.
- Note: if smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

Miscellaneous

Give requisition to the 3D lab for processing.

Acquisition Parameters

Series 1, Scout

	Small	Medium	Large
Scout 1 kV	100	120	140
Scout 1 mA	10	10	10
Scout 1 Angle	180	180	180
Scout 2 kV	100	120	140
Scout 2 mA	40	40	80
Scout 2 Angle	90	90	90
WW/WL for Scout	500/50	500/50	500/50

Series 2, Scan Phase

	Small	Medium	Large
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**40**	**40**	**40**
Detector Rows	**64.0**	**64.0**	**64.0**
Detector Configuration	**64x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Large Body**	**Large Body**	**Large Body**
Pitch	**0.516**	**0.516**	**0.516**
Speed (mm/rot)	**20.60**	**20.60**	**20.60**
Rotation Time (s)	**0.7**	**0.7**	**0.7**
kV	**80**	**100**	**120**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(25-390)**	**(20-420)**	**(25-490)**
Manual mA	**200.0**	**210.0**	**300.0**
Noise Index	**28.0**	**34.0**	**41.5**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Series 2, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**30% / 20% / Medium**	**30% / 20% / Medium**	**30% / 20% / Medium**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**
Recon 2 (Secondary)			
DFOV	**30**	**40**	**50**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**1500/-700**	**1500/-700**	**1500/-700**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**	**None**	**None**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Prospectively-Gated Left Atrial Appendage 5.73/5.74/5.75

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Indication

Evaluation for left atrial thrombus, pre-op for device (Watchman (TM)) implant. Left atrial appendage occlusion, also referred to as Left atrial appendage closure is a treatment strategy to reduce the risk of left atrial appendage blood clots from entering the bloodstream and causing a stroke in patients with non-valvular atrial fibrillation.

Oral Contrast

None

Pre-Scan Instructions

- Tilt Gantry to S10,then back to zero, when it gets back to zero press both tilt buttons at the same time to "reset" the scanner.
- Practice Breathing Instructions. Ask patient to cough just prior to the scan.

IV Contrast Parameters 350

Select Ulrich protocols 76-78

Weight Ranges	Contrast Dosage	Injection Rate
<200 lbs. (<90 kg)	79 mL of Iohexol 350 mgI/mL + 50 mL NaCl flush	5 mL/sec
200-300 lbs (90-136 kg)	106 mL of Iohexol 350 mgI/mL + 50 mL NaCl flush	5 mL/sec
>300 lbs (>136 kg)	132 mL of Iohexol 350 mgI/mL + 50 mL NaCl flush	5.5 mL/sec
18 G Antecubital IV Started in the Right Arm		

IV Contrast Parameters 300/370

Weight Ranges	Contrast Dosage	Injection Rate
<200 lbs. (<90 kg)	75 mL of Iopamidol 370 mgI/mL (Isovue) + 50 mL NaCl flush	5 mL/sec
200-300 lbs (90-136 kg)	100 mL of Iopamidol 370 mgI/mL (Isovue) + 50 mL NaCl flush	5 mL/sec
>300 lbs (>136 kg)	125 mL of Iopamidol 370 mgI/mL (Isovue) + 50 mL NaCl flush	5.5 mL/sec
18 G Antecubital IV Started in the Right Arm		

Field of View

25 cm

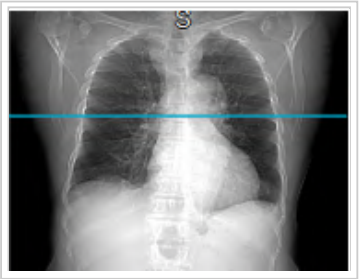
Scan Description

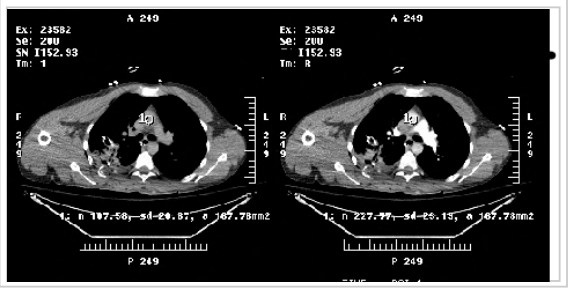
- Series 1 – PA and lateral scout
  - Coverage: Lower Neck to Below lung Base
  - Expiration breathing instructions
- Series 2 - CTA
  - Scan on expiration, **you will need to manually breathe the patient after the first scan and before the second scan**. The patient will have 30 seconds to breathe inbetween the two groups. This is a gated study.
  - Please record a new HR on the first group before this scan phase. Make sure to only have only the first group selected (not both groups) in order to record the heart rate. If you have both groups selected it

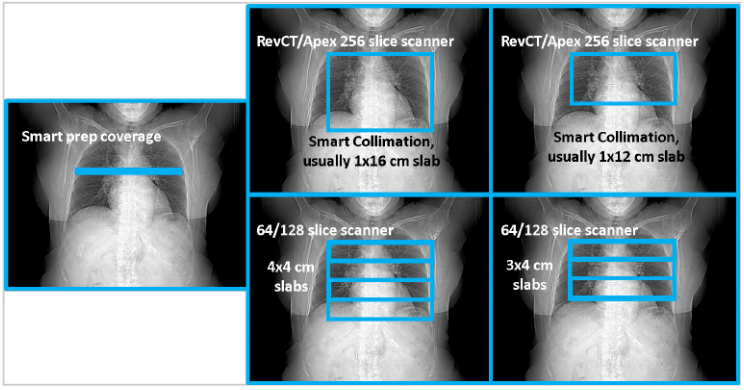
will not work.

- It is difficult to see which group is which, with the groups overlapping each other, may need to click on each group individually to correctly prescribe scan.
  - 1st Group - CTA Phase. Coverage: Start the top of the scan 1 cm above the carina bifurcation and scan to the diaphragm. You need to cover the LA and the pulmonary vein using 4 slabs only. 160mm coverage.
  - 30 Second Prep Group Delay built into scanner.
  - 2nd Group - Delay Phase (acquired approximately 60 seconds post contrast injection). Coverage: Do not change your start location, pull the bottom/end location UP one slab (using only three slabs). 120 mm coverage. You need to cover just the LAA.

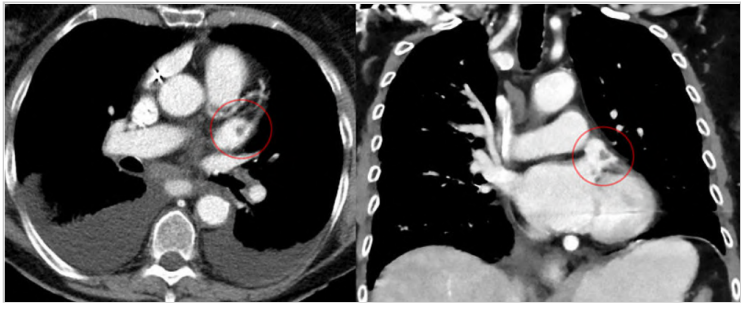
SmartPrep on the ascending aorta at the level of the carina







Scan coverages



Approximate location of LAA

Reformat Instructions

Both prospective series need to be reconstructed at 30% R-R with a 0% interval. The slice thickness should be 0.625 mm.

For the Delayed series, please create a 2.5 mm thickness by 1.25 mm interval axial reformat with a skin to to skin FOV. You will need to do a retro recon for this in order to change the FOV larger than the 25 cm we used for the delay RFOV.

- Non Revolution CT (Rev 256) Scanners
  - Please retro recon the CTA series with a bone +, ww 1500 wl -700, 0.625 mm X 0.625 mm, IQ Enhance On, Plus Mode On, ASiR/ASiR-V set to 0%.
  - Using our routine chest reformats, perform a manual axial MIP, CO and SA of the chest on the **with contrast CTA series**.
- Revolution CT (Rev 256) Scanners
  - Please retro recon the Thin ST CTA series to the largest DFOV. Then use this series to manually create the axial MIP reformat.

In the United States, CT Angiography CPT codes require the performance and documentation of 3D angiographic rendering, which may include maximum intensity projection (MIP), volumetric rendering, and/or surface rendering techniques.

Reformats

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
MIPS	THIN ST	Manual	MIP	1500/-700	10	5	axial
SA	LUNG	DMPR	Average	1500/-700	2.5	1.25	sagittal Include the spine and sternum.
CO	LUNG	DMPR	Average	1500/-700	2.5	1.25	coronal Include the spine and sternum.

Networking

- All images are sent to PACS (ALI_Store).
- Note: if smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

Miscellaneous

None

Acquisition Parameters

Series 1, Scout

	Small	Medium	Large
Scout 1 kV	100	120	140
Scout 1 mA	10	20	40
Scout 1 Angle	180	180	180
Scout 2 kV	100	120	140
Scout 2 mA	10	20	40
Scout 2 Angle	90	90	90
WW/WL for Scout	500/50	500/50	500/50

Series 2, Group 1, Smart Prep

	Small	Medium	Large
mA	**40**	**40**	**40**
Monitoring Delay (sec)	**4**	**4**	**4**
Monitoring ISD (sec)	**2.5**	**2.5**	**2.5**
Enhancement Threshold (HU)	**80**	**80**	**80**
Diagnostic Delay	**Auto Minimum**	**Auto Minimum**	**Auto Minimum**

Series 2, Group 1, Scan Phase

	Small	Medium	Large
Scan Type	**Cardiac**	**Cardiac**	**Cardiac**
Cardiac Mode	**Snap Shot Pulse (Cine)**	**Snap Shot Pulse (Cine)**	**Snap Shot Pulse (Cine)**
Beam Collimation	**40**	**40**	**40**
Scan FOV	**Large Cardiac**	**Large Cardiac**	**Large Cardiac**
Rotation Time (s)	**0.35**	**0.35**	**0.35**
kV	**80**	**100**	**120**
mA	**400**	**480**	**560**
Padding Override	**ON**	**ON**	**ON**
Cardiac Gating	**ON**	**ON**	**ON**
R-Peak Delay(%)	**70%**	**70%**	**70%**
Adaptive Gating	**ON**	**ON**	**ON**
Max #Beats to Avoid	**2**	**2**	**2**
Slice Thickness (mm)	**0.625**	**0.625**	**0.625**

Note: for the LAA protocol change the gating center to 30% from 70%.

Series 2, Group 1 Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**25**	**25**	**25**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**450/50**	**450/50**	**450/50**
Recon Option	**Snap Shot Segment**	**Snap Shot Segment**	**Snap Shot Segment**
Recon Option			
ASiR/ASiR256/DLIR	**60% / 60%**	**60% / 60%**	**60% / 60%**
Slice Thickness (mm)	**0.625**	**0.625**	**0.625**
Interval (mm)	**n/a**	**n/a**	**n/a**
Recon 2 (Secondary)			
DFOV	**30**	**40**	**50**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**1500/-700**	**1500/-700**	**1500/-700**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**	**None**	**None**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**
Recon 3 (Secondary) (Rev256 Only)			
DFOV	Earliest to Latest	Earliest to Latest	Earliest to Latest
Recon Type			
WW/WL			
Recon Option			
Recon Option			
ASiR/ASiR256/DLIR			
Slice Thickness (mm)			
Interval (mm)			
Recon 4 (Secondary) (Rev256 Only)			
DFOV	Snap Shot Freeze	Snap Shot Freeze	Snap Shot Freeze
Recon Type			
WW/WL			
Recon Option			
Recon Option			
ASiR/ASiR256/DLIR			
Slice Thickness (mm)			
Interval (mm)			

Series 2, Group 2, Scan Phase

	Small	Medium	Large
Scan Type	**Cardiac**	**Cardiac**	**Cardiac**
Cardiac Mode	**Snap Shot Pulse (Cine)**	**Snap Shot Pulse (Cine)**	**Snap Shot Pulse (Cine)**
Beam Collimation	**40**	**40**	**40**
Scan FOV	**Large Cardiac**	**Large Cardiac**	**Large Cardiac**
Rotation Time (s)	**0.35**	**0.35**	**0.35**
kV	**80**	**100**	**120**
mA	**400**	**480**	**560**
Padding Override	**ON**	**ON**	**ON**
Cardiac Gating	**ON**	**ON**	**ON**
R-Peak Delay(%)	**70%**	**70%**	**70%**
Adaptive Gating	**ON**	**ON**	**ON**
Max #Beats to Avoid	**2**	**2**	**2**
Slice Thickness (mm)	**0.625**	**0.625**	**0.625**

Note: for the LAA protocol change the gating center to 30% from 70%.

Series 2, Group 2 Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**25**	**25**	**25**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**450/50**	**450/50**	**450/50**
Recon Option	**Snap Shot Segment**	**Snap Shot Segment**	**Snap Shot Segment**
Recon Option			
ASiR/ASiR256/DLIR	**60% / 60%**	**60% / 60%**	**60% / 60%**
Slice Thickness (mm)	**0.625**	**0.625**	**0.625**
Interval (mm)	**n/a**	**n/a**	**n/a**
Recon 2 (Secondary) (Rev256 Only)			
DFOV	Earliest to Latest	Earliest to Latest	Earliest to Latest
Recon Type			
WW/WL			
Recon Option			
Recon Option			
ASiR/ASiR256/DLIR			
Slice Thickness (mm)			
Interval (mm)			
Recon 3 (Secondary) (Rev256 Only)			
DFOV	Snap Shot Freeze	Snap Shot Freeze	Snap Shot Freeze
Recon Type			
WW/WL			
Recon Option			
Recon Option			
ASiR/ASiR256/DLIR			
Slice Thickness (mm)			
Interval (mm)			

Thoracic Outlet 5.83/5.84/5.85

Indication

Evaluation for suspected unilateral thoracic outlet obstruction.

Oral Contrast

None

Pre-Scan Instructions

- Start the 18g IV in the non-affected arm or bilaterally if both arms are ordered.
- Make sure hand on affected arm is warm. Use blankets or hot packs to warm it up.

IV Contrast Parameters 350

Select Ulrich protocol 82

Load 143 mL contrast Iohexol 350 and 100 mL saline. Injection will be in the unaffected arm.

IV Contrast Parameters 300/370

Load 135 mL contrast Isovue 370 and 100 mL saline. Injection will be in the unaffected arm.

Field of View

Same as previous study or as small as appropriate

Scan Description

Part 1

- Series 1: PA and Lateral Scout with both arms at the patients side.
  - Coverage: From lower neck to diaphragm on inspiration.
- Series 2: CTA Phase arms at patients side.
  - Coverage: From below the carina to lower neck on inspiration.
  - Smart Prep: Center over the aortic arch and place the ROI on the proximal aortic arch.
  - IV: 50 mL IV contrast at 5 mL/sec followed by 40 mL saline at 5 mL/sec.

Part 2

- Series 3: PA and Lateral Scout with the **affected arm up**
  - Coverage: From carina through finger tips on inspiration.
- Series 4: CTA Phase, affected arm up
  - Coverage: From aortic arch through finger tips on inspiration.
  - Smart Prep: Center over the aortic arch and place the ROI on the proximal aortic arch.
  - IV: 25 mL IV contrast at 5 mL/sec followed by 60 mL IV contrast at 4 mL/sec then 40 mL saline at 4 mL/sec

Part 3

- Series 5: Delayed Phase
  - Timing: This scan should be started 70 seconds after the contrast injection from the previous series.
  - Coverage: Scan from the carina to the elbow.

Reformat Instructions

See table below.

In the United States, CT Angiography CPT codes require the performance and documentation of 3D angiographic rendering, which may include maximum intensity projection (MIP), volumetric rendering, and/or surface rendering techniques.

Reformats

Please Perform on Upper Extremity CTA series with affected arm up.

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
CO	Thin ST	Manual	MIP	450/50	1.25	0.625	CORONAL from skin to skin

Billing

CTA Upper Extremity

Acquisition Parameters
Series 1, Scout

	Small	Medium	Large
Scout 1 kV	100	120	140
Scout 1 mA	10	10	10
Scout 1 Angle	180	180	180
Scout 2 kV	100	120	140
Scout 2 mA	40	40	80
Scout 2 Angle	90	90	90
WW/WL for Scout	500/50	500/50	500/50

Series 2, Smart Prep

	Small	Medium	Large
mA	40	40	40
Monitoring Delay (sec)	4	4	4
Monitoring ISD (sec)	1.0	1.0	1.0
Enhancement Threshold (HU)	80	80	80
Diagnostic Delay	Auto Minimum	Auto Minimum	Auto Minimum

Series 2, Scan Phase

	Small	Medium	Large
Scan Type	Helical	Helical	Helical
Beam Collimation	40	40	40
Detector Rows	64.0	64.0	64.0
Detector Configuration	64x0.625	64x0.625	64x0.625
Scan FOV	Large Body	Large Body	Large Body
Pitch	0.984	0.984	0.984
Speed (mm/rot)	39.40	39.40	39.40
Rotation Time (s)	0.5	0.5	0.5
kV	100	100	120
AEC type	smart mA	smart mA	smart mA
mA Range	(80-480)	(90-480)	(110-560)
Manual mA	240.0	380.0	530.0
Noise Index	12.0	18.5	22.5
Slice Thickness (mm)	1.25	1.25	1.25
Interval (mm)	0.625	0.625	0.625

Series 2, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**30% / 20% / Medium**	**30% / 20% / Medium**	**30% / 20% / Medium**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Series 3, Scout

	Small	Medium	Large
Scout 1 kV	**100**	**120**	**140**
Scout 1 mA	**10**	**10**	**10**
Scout 1 Angle	**180**	**180**	**180**
Scout 2 kV	**100**	**120**	**140**
Scout 2 mA	**40**	**40**	**80**
Scout 2 Angle	**90**	**90**	**90**
WW/WL for Scout	**500/50**	**500/50**	**500/50**

Series 4, Smart Prep

	Small	Medium	Large
mA	**40**	**40**	**40**
Monitoring Delay (sec)	**4**	**4**	**4**
Monitoring ISD (sec)	**1.0**	**1.0**	**1.0**
Enhancement Threshold (HU)	**80**	**80**	**80**
Diagnostic Delay	**Auto Minimum**	**Auto Minimum**	**Auto Minimum**

Series 4, Scan Phase

	Small	Medium	Large
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**40**	**40**	**40**
Detector Rows	**64.0**	**64.0**	**64.0**
Detector Configuration	**64x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Large Body**	**Large Body**	**Large Body**
Pitch	**0.984**	**0.984**	**0.984**
Speed (mm/rot)	**39.40**	**39.40**	**39.40**
Rotation Time (s)	**0.5**	**0.5**	**0.5**
kV	**100**	**100**	**120**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(80-480)**	**(90-480)**	**(110-560)**
Manual mA	**240.0**	**380.0**	**530.0**
Noise Index	**12.0**	**18.5**	**22.5**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Series 4 Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**30% / 20% / Medium**	**30% / 20% / Medium**	**30% / 20% / Medium**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Series 5 Scan Phase

	Small	Medium	Large
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**40**	**40**	**40**
Detector Rows	**64.0**	**64.0**	**64.0**
Detector Configuration	**64x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Large Body**	**Large Body**	**Large Body**
Pitch	**0.984**	**0.984**	**0.984**
Speed (mm/rot)	**39.40**	**39.40**	**39.40**
Rotation Time (s)	**0.5**	**0.5**	**0.5**
kV	**100**	**100**	**120**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(80-480)**	**(90-480)**	**(110-560)**
Manual mA	**240.0**	**380.0**	**530.0**
Noise Index	**12.0**	**18.5**	**22.5**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Series 5 Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**30% / 20% / Medium**	**30% / 20% / Medium**	**30% / 20% / Medium**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Post-Endostent Non-Con Volume Change (Abd/Pelvis only) 6.43/6.44/6.45

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Indication

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.

Oral Contrast

None

Pre-Scan Instructions

Notify the 3D technologist that a volume patient is on the table

IV Contrast Parameters

None

Field of View

As small as possible to a minimum of 32 cm, while still including entire lungs and abdomen (can clip subcutaneous fat). Be sure to include femoral arteries if pelvis is included.

Scan Description

- Series 1 - PA and lateral scout from diaphragm to pubic symphysis
- Series 2 - Non-contrast
  - During inspiration breath-hold
  - Coverage:Abd/Pelvis: Diaphragm to pubic symphysis
- Patient may get off table and remain in the waiting area
  - If non-contrast images show <2% volume increase, then patient may go
  - If non-contrast images show >2% volume increase, bring patient back and perform enhanced CTA and delayed series as (use the Nongated CTA protocol for this)
  - Billing: CT Abd/Pel w/o IVC and 3D

Reformat Instructions

In the United States, CT Angiography CPT codes require the performance and documentation of 3D angiographic rendering, which may include maximum intensity projection (MIP), volumetric rendering, and/or surface rendering techniques.

Reformats

None.

Networking

- All the images are sent to PACS (ALI_Store) and 3D Lab workstation.

- Note: if smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

Miscellaneous

Give requisition to the 3D lab for processing.

Acquisition Parameters

Series 1, Scout

	Small	Medium	Large
Scout 1 kV	**100**	**120**	**140**
Scout 1 mA	**10**	**10**	**10**
Scout 1 Angle	**180**	**180**	**180**
Scout 2 kV	**100**	**120**	**140**
Scout 2 mA	**40**	**40**	**80**
Scout 2 Angle	**90**	**90**	**90**
WW/WL for Scout	**500/50**	**500/50**	**500/50**

Series 2, Scan Phase

	Small	Medium	Large
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**40**	**40**	**40**
Detector Rows	**64.0**	**64.0**	**64.0**
Detector Configuration	**64x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Large Body**	**Large Body**	**Large Body**
Pitch	**1.375**	**1.375**	**1.375**
Speed (mm/rot)	**55.00**	**55.00**	**55.00**
Rotation Time (s)	**0.7**	**0.7**	**1**
kV	**100**	**120**	**140**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(30-450)**	**(30-560)**	**(25-490)**
Manual mA	**220.0**	**280.0**	**300.0**
Noise Index	**28.5**	**36.0**	**45.5**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Series 2, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**30% / 20% / Medium**	**30% / 20% / Medium**	**30% / 20% / Medium**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Lower Extremity CTA 9.13/9.14/9.15

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Indication

For iliac occlusive disease, peripheral vascular disease, and patients with a “cold foot”. For patients with “cold foot” use complete coverage.

Video for this protocol

Oral Contrast

None

Pre-Scan Instructions

Place feet close together, straight, and near the center of the scanner. If necessary secure patients feet together with tape to support.

IV Contrast Parameters 350

Select Ulrich protocols 83-85

Weight Ranges	Contrast Dosage	Injection Rate
<200 lbs. (<90 kg)	Load 106 mL of Iohexol 350 mgI/mL + 70 mL NaCl flush	4 mL/sec
200-300 lbs (90-136 kg)	Load 132 mL of Iohexol 350 mgI/mL + 70 mL NaCl flush	5 mL/sec
>300 lbs (>136 kg)	Load 159 mL of Iohexol 350 mgI/mL + 70 mL NaCl flush	5.5 mL/sec

IV Contrast Parameters 300/370

Weight Ranges	Contrast Dosage	Injection Rate
<200 lbs. (<90 kg)	Load 100 mL of Iopamidol 370 mgI/mL (Isovue) + 70 mL NaCl flush	4 mL/sec
200-300 lbs (90-136 kg)	Load 125 mL of Iopamidol 370 mgI/mL (Isovue) + 70 mL NaCl flush	5 mL/sec
>300 lbs (>136 kg)	Load 150 mL of Iopamidol 370 mgI/mL (Isovue) + 70 mL NaCl flush	5.5 mL/sec

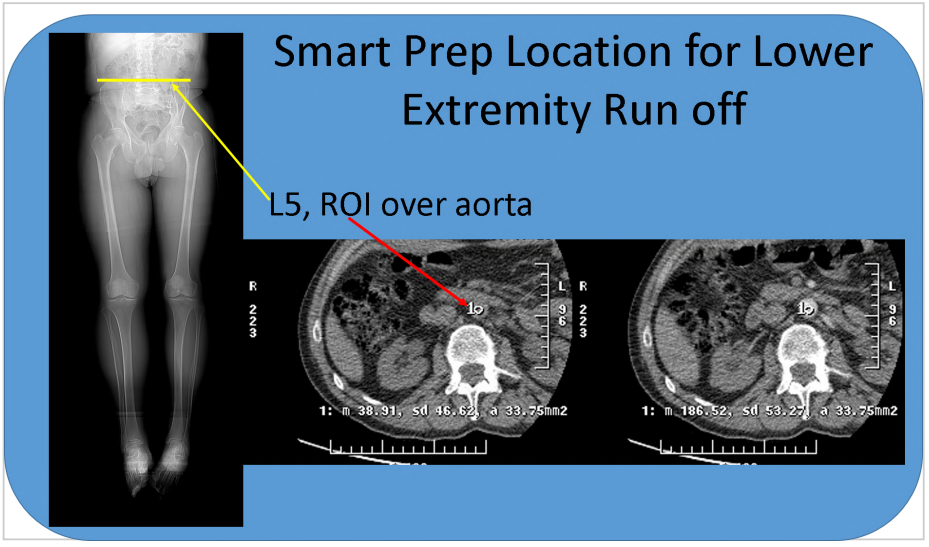
Field of View

As small as possible to a minimum of 32 cm, while still including aorta, iliac, femoral and lower extremity vessels. Please also include smaller 20 FOV recons of each side, knees down.

Scan Description

- Series 1 – PA and lateral scout
  - Coverage: carina through tips of toes
- Series 2 – Non-contrast
  - Coverage:
    - ACUTE EMBOLISM: Carina through tips of toes
    - ROUTINE: Diaphragm through toes
    - FOCUSED: As specified by Radiologist. If not specified, then contact protocolling physician to determine appropriate coverage.
- Series 3, Group 1 - CTA
  - Smart Prep - Monitor Phase: On the aorta just above the common iliac bifurcation. **Dynamic transition is turned on so the scan will progress without the need for you to hit 'scan phase'.** If the smart prep

has not peaked after 30 seconds, please scan. There a diagnostic delay of 12 seconds built in after the peak of contrast.
    - Coverage is the same as your Non-Contrast scan.
- Please recon each leg from the top of the femoral head through the toes in a 20 DFOV (or as small as possible to include entire calf and foot). These recons are built into the protocol and just need to be prescribed at scan time.
- Series 3, Group 2 - CTA knees down
    - Immediately follow with 2nd scan from popliteal fossa to tips of toes (all in one series, but two groups)
    - If there are more than 3000 images within this series, the scanner will not let you scan. You need to delete the second group. Scan the first group, once completed, hit repeat series move the start location to the knees, the end location should still be set up at the toes and then scan the delays.



Smart prep location

Reformat Instructions

Do coronal reformats at three different levels, making sure to include the anatomy in the DFOV below:

1. From above diaphragm to just below Symphysis pubis
2. From above femoral heads to just below the knee joint
3. From above the knee joint to the bottom of the feet (choose aquisition with best arterial enhancement). You may not be able to get this exact slice thickness and interval (1.5 X 0.98 usually works). More importantly overlap!

In the United States, CT Angiography CPT codes require the performance and documentation of 3D angiographic rendering, which may include maximum intensity projection (MIP), volumetric rendering, and/or surface rendering techniques.

Reformats

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
CO ABD/PEL	Thin ST CTA	Manual	Average	800/150	1.25	0.98	coronal
CO PELVIS TO KNEES	Thin ST CTA	Manual	Average	800/150	1.25	0.98	coronal
CO KNEES TO FEET	Thin ST CTA	Manual	Average	800/150	1.25	0.98	coronal

Networking

- Send all series to PACS (ALI_Store).

- Send Angio series to CTAW1/ 3D Lab. Auto-networking should be set-up.
- Note: if smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

Miscellaneous

None

Acquisition Parameters

Series 1, Scout

	Small	Medium	Large
Scout 1 kV	**100**	**120**	**140**
Scout 1 mA	**10**	**10**	**10**
Scout 1 Angle	**180**	**180**	**180**
Scout 2 kV	**100**	**120**	**140**
Scout 2 mA	**40**	**40**	**80**
Scout 2 Angle	**90**	**90**	**90**
WW/WL for Scout	**500/50**	**500/50**	**500/50**

Series 2, Scan Phase

	Small	Medium	Large
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**40**	**40**	**40**
Detector Rows	**64.0**	**64.0**	**64.0**
Detector Configuration	**64x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Large Body**	**Large Body**	**Large Body**
Pitch	**1.375**	**1.375**	**1.375**
Speed (mm/rot)	**55.00**	**55.00**	**55.00**
Rotation Time (s)	**0.5**	**0.5**	**0.7**
kV	**100**	**120**	**140**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(25-430)**	**(25-530)**	**(25-480)**
Manual mA	**210.0**	**270.0**	**290.0**
Noise Index	**24.0**	**31.0**	**39.0**
Slice Thickness (mm)	**2.5**	**2.5**	**2.5**
Interval (mm)	**1.5**	**1.5**	**1.5**

Series 2, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option			
ASiR/ASiR256/DLIR	**30% / 20% / Medium**	**30% / 20% / Medium**	**30% / 20% / Medium**
Slice Thickness (mm)	**2.5**	**2.5**	**2.5**
Interval (mm)	**1.5**	**1.5**	**1.5**

Series 3, Smart Prep

	Small	Medium	Large
mA	**40**	**40**	**40**
Monitoring Delay (sec)	**10**	**10**	**10**
Monitoring ISD (sec)	**1.0**	**1.0**	**1.0**
Enhancement Threshold (HU)	**80**	**80**	**80**
Diagnostic Delay	**12**	**12**	**12**

Series 3, Group 1, Scan Phase

	Small	Medium	Large
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**40**	**40**	**40**
Detector Rows	**64.0**	**64.0**	**64.0**
Detector Configuration	**64x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Large Body**	**Large Body**	**Large Body**
Pitch	**0.984**	**0.984**	**0.984**
Speed (mm/rot)	**39.40**	**39.40**	**39.40**
Rotation Time (s)	**0.5**	**0.5**	**0.5**
kV	**100**	**100**	**120**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(80-480)**	**(90-480)**	**(110-560)**
Manual mA	**240.0**	**380.0**	**530.0**
Noise Index	**12.0**	**18.5**	**22.5**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Series 3, Group 1, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**30% / 20% / Medium**	**30% / 20% / Medium**	**30% / 20% / Medium**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

	Right Lower Leg	Right Lower Leg	Right Lower Leg
Recon 2 (Right Lower Leg)			
DFOV	**20**	**20**	**20**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**30% / 20% / Medium**	**30% / 20% / Medium**	**30% / 20% / Medium**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

	Left Lower Leg	Left Lower Leg	Left Lower Leg
Recon 3 (Left Lower Leg)			
DFOV	**20**	**20**	**20**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**30% / 20% / Medium**	**30% / 20% / Medium**	**30% / 20% / Medium**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Series 3, Group 2, Scan Phase

	Small	Medium	Large
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**40**	**40**	**40**
Detector Rows	**64.0**	**64.0**	**64.0**
Detector Configuration	**64x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Large Body**	**Large Body**	**Large Body**
Pitch	**0.984**	**0.984**	**0.984**
Speed (mm/rot)	**39.40**	**39.40**	**39.40**
Rotation Time (s)	**0.5**	**0.5**	**0.5**
kV	**100**	**100**	**120**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(80-480)**	**(90-480)**	**(110-560)**
Manual mA	**240.0**	**380.0**	**530.0**
Noise Index	**12.0**	**18.5**	**22.5**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Series 3, Group 2, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**30% / 20% / Medium**	**30% / 20% / Medium**	**30% / 20% / Medium**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Shoulder/Humerus (with or without Metal) 4.1/4.2/4.3

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Pediatric Patients Under 13 years of age: See Appendix for Technique Instruction, Guidance for pediatric extremity MSK protocols

Indication

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.

Oral Contrast

None

Pre-Scan Instructions

The breathing instructions are turned on to reduce motion.

Non-Arthrogram:

- Image the shoulder of interest with the patient lying supine with the arm being scanned at their side.
- The imaged shoulder should lie in the neutral position (palm facing the ceiling).
- Place the contralateral shoulder in the ABER position. (See picture below)
- Have the patient turn their head away from the shoulder being imaged.
- Move the imaged shoulder as close to the center of the scan field as possible. Image sharpness degrades significantly as an object is moved from the center to the edge of the 50 cm scan field of view.

Arthrogram:

- The patient is positioned supine in the CT scanner and 2 scans are performed.
- For the first scan the patient's arm is at their side, PALM UP, and the shoulder is scanned as in a routine CT, and the 3 standard sets of reformatted images are made.
- For the second scan the patient shoulder is placed in the Abducted/External Rotation (ABER) position, with their hand behind their head.

Arthrogram Position

IV Contrast Parameters 350

Medrad™ P3T Abdomen protocol, Ulrich Routine Body Adult, or UW ConCal for weight based contrast.

Iohexol (Omnipaque) 350 mg/mL injection at a rate of 3 mL/sec

Rate: As appropriate for IV access (up to 3mL/sec)

Delay: 90sec

For sites without the Medrad™ P3T or UW ConCal option, refer to the weight based contrast tables we provide in the protocol booklet.

IV Contrast Parameters 300/370

Medrad™ P3T Abdomen protocol.

Iohexol (Omnipaque) 300 mg/mL injection at a rate of 3 mL/sec

Rate: As appropriate for IV access (up to 3mL/sec)

Delay: 90sec

For sites without the Medrad™ P3T or P3T PA option, refer to the weight based contrast tables we provide in the protocol booklet.

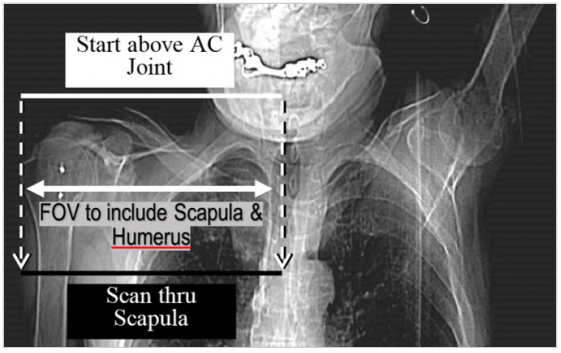
Field of View

24 cm

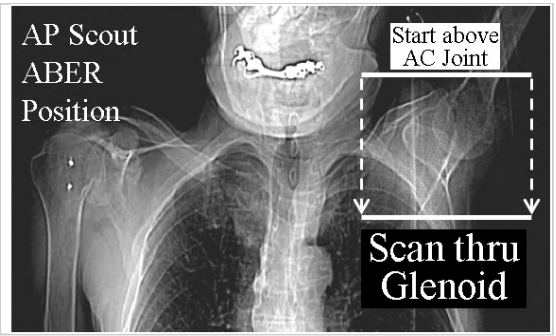
Scan Description

- Series 1 - PA and lateral scout
- Series 2 - CT Shoulder
  - Coverage (non-arthrogram):
    - From above Acromial-Clavicular (AC) joint, through the bottom of the scapula.
    - Field of View (FOV) wide enough to include entire scapula and proximal humerus.
    - If there is a shoulder prosthesis, scan past the end of the humeral component.
- Series 3 - CT shoulder arthrogram (OPTIONAL)
  - Coverage (Arthrogram):
    - From above Acromial-Clavicular (AC) joint, past the bottom of the glenoid.

- Field of View (FOV) wide enough to include: SC joint, entire scapula and proximal humerus. Scan coverage should resemble the image below.



Shoulder Scan Range (routine)

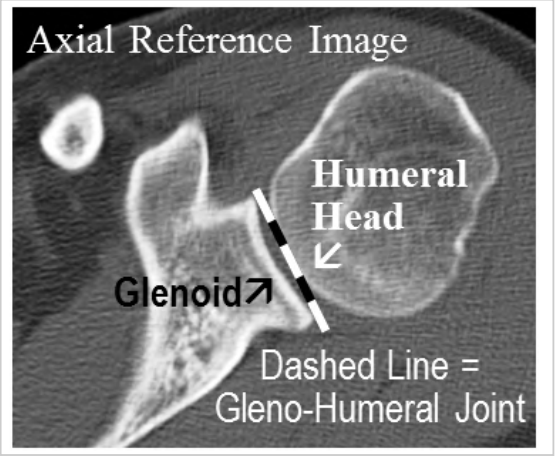


ABER Position

Reformat Instructions

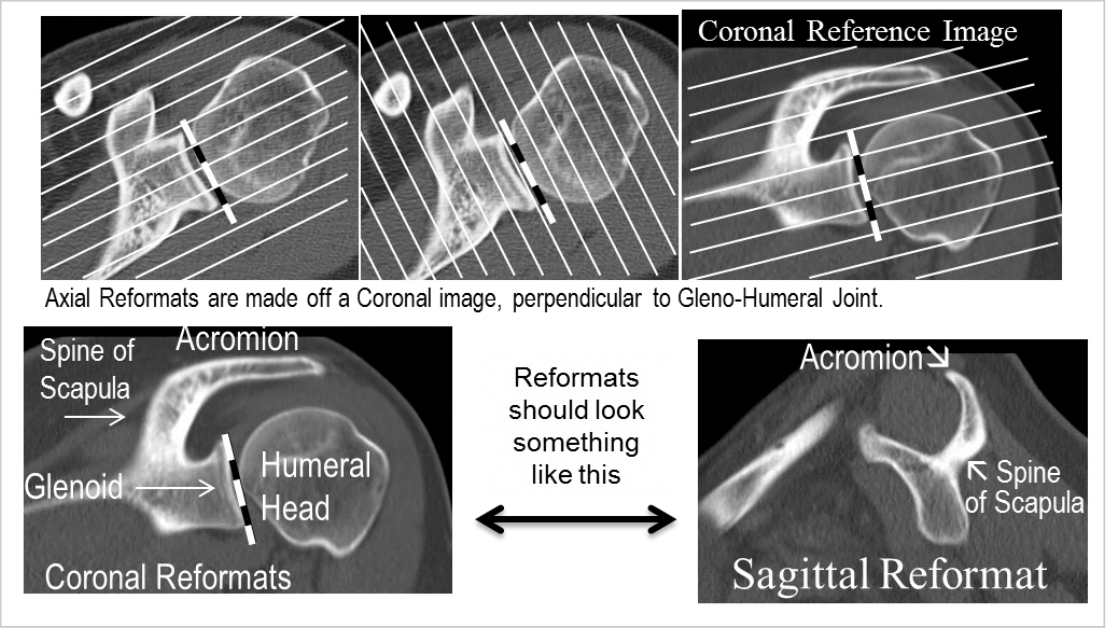
Non-Arthrogram:

- Reformat in 3 planes using the "BonePlus" images in a "Bone Window" (2500/350).
- All reformats are 2mm thick at 1mm intervals.
- ALL REFORMATS ARE RELATIVE TO THE GLENO-HUMERAL JOINT (Shown below).



Relative guide for reformats

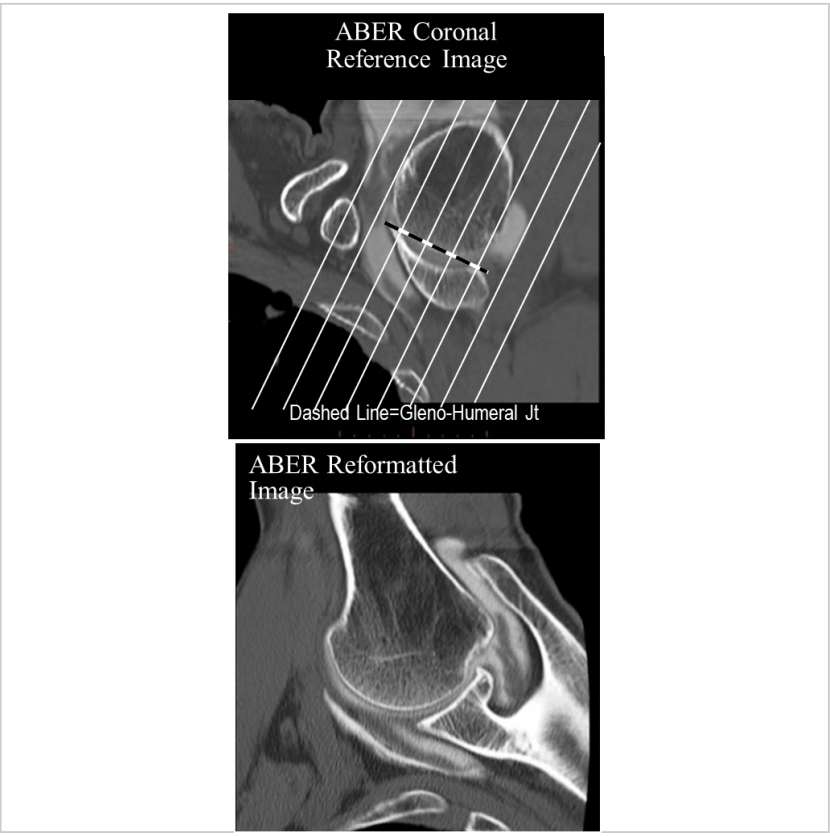
- Coronal & Sagittal Reformats are made off an Axial reference image, perpendicular & parallel to the Gleno-Humeral Joint.



Images of what the reformats should look like

Arthrogram:

- Using the ABER source images, find a Coronal reference image through the middle of the Gleno-Humeral Joint.
- Create ABER reformatted images perpendicular to the Gleno-Humeral Joint, 2mm thick at 1mm intervals.
- The ABER images should look something like the image below:



ABER reformats

- **If a HD/GSI Scan**: Recons & Reformats: Do all reformats specific for this protocol on the 140 keV BonePlus recon (QC is recon 1) and send to ALI_Store.

If a long bone scan (humerus) is ordered, do CO/SA/AX reformat in 2x1 mm using the thin bone series.

Reformats

For Adults and Pediatrics:

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
AX	Thin Bone	Manual	Average	2500/350	2	1	axial
CO	Thin Bone	Manual	Average	2500/350	2	1	coronal
SA	Thin Bone	Manual	Average	2500/350	2	1	sagittal
ABER	Thin Bone	Manual	Average	2500/350	2	1	Aber
AX ST	Thin Soft Tissue	Manual	Average	450/50	2	1	axial

Networking

- All images are networked to PACS (ALI_Store).
- Note: If smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

Miscellaneous

None

Acquisition Parameters

Series 1, Scout

	Small	Medium	Large
Scout 1 kV	140	140	140
Scout 1 mA	10	10	10
Scout 1 Angle	180	180	180
Scout 2 kV	140	140	140
Scout 2 mA	80	80	80
Scout 2 Angle	90	90	90
WW/WL for Scout	500/50	500/50	500/50

Series 2, Scan Phase

	Small	Medium	Large
Scan Type	Helical	Helical	Helical
Beam Collimation	40	40	40
Detector Rows	64.0	64.0	64.0
Detector Configuration	64x0.625	64x0.625	64x0.625
Scan FOV	Large Body	Large Body	Large Body
Pitch	0.516	0.516	0.516
Speed (mm/rot)	20.60	20.60	20.60
Rotation Time (s)	0.5	0.7	0.8
kV	140	140	140
AEC type	smart mA	smart mA	smart mA
mA Range	(40-320)	(45-430)	(45-500)
Manual mA	200.0	210.0	290.0
Noise Index	14.5	20.0	29.5
Slice Thickness (mm)	1.25	1.25	1.25
Interval (mm)	0.625	0.625	0.625

Series 2, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**24**	**24**	**24**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**2500/350**	**2500/350**	**2500/350**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR			
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**
Recon 2 (Secondary)			
DFOV	**24**	**24**	**24**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

If your Scanner has MAR software, turn this additional recon "ON" in the presence of metal.

	Small	Medium	Large
Recon 3 (Secondary)			
DFOV	**24**	**24**	**24**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
Recon Option	**MARS On**	**MARS On**	**MARS On**
ASiR/ASiR256/DLIR	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Series 3, Scout

	Small	Medium	Large
Scout 1 kV	**140**	**140**	**140**
Scout 1 mA	**10**	**10**	**10**
Scout 1 Angle	**180**	**180**	**180**
Scout 2 kV	**140**	**140**	**140**
Scout 2 mA	**80**	**80**	**80**
Scout 2 Angle	**90**	**90**	**90**
WW/WL for Scout	**500/50**	**500/50**	**500/50**

Series 4, Scan Phase

	Small	Medium	Large
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**40**	**40**	**40**
Detector Rows	**64.0**	**64.0**	**64.0**
Detector Configuration	**64x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Large Body**	**Large Body**	**Large Body**
Pitch	**0.516**	**0.516**	**0.516**
Speed (mm/rot)	**20.60**	**20.60**	**20.60**
Rotation Time (s)	**0.5**	**0.7**	**0.8**
kV	**140**	**140**	**140**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(40-320)**	**(45-430)**	**(45-500)**
Manual mA	**200.0**	**210.0**	**290.0**
Noise Index	**14.5**	**20.0**	**29.5**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Series 4, Recons

No Metal	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**24**	**24**	**24**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**2500/350**	**2500/350**	**2500/350**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR			
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**
Recon 2 (Secondary)			
DFOV	**24**	**24**	**24**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

If your Scanner has MAR software, turn this additional recon "ON" in the presence of metal.

Small	Medium	Large
Recon 3 (Secondary)		
DFOV	**24**	**24**	**24**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
Recon Option	**MARS On**	**MARS On**	**MARS On**
ASiR/ASiR256/DLIR	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Elbow/Forearm (without Metal) 4.6

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Pediatric Patients Under 13 years of age: See Appendix for Technique Instruction, Guidance for pediatric extremity MSK protocols

Indication

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.

Oral Contrast

None

Pre-Scan Instructions

<u>Keys to Optimally Positioning the Elbow</u>

The elbow is the most difficult joint to scan. It is usually a challange to optimally position the elbow, particularly when the elbow is in a cast. The better the elbow is positioned in the scanner, the easier it will be to make the reformats.

Ideally, the arm should be raised above the patient's head. This is best achieved with the patient laying supine on the table. Sometimes creative positioning (prone, decubitus) will be necessary. Proper positioning is crucial for a couple reasons:

- It puts the elbow near the center of the scanner (allowing use of "Small SFOV").
- It avoids radiation to the head and torso.

If the patient's elbow is not in a cast:

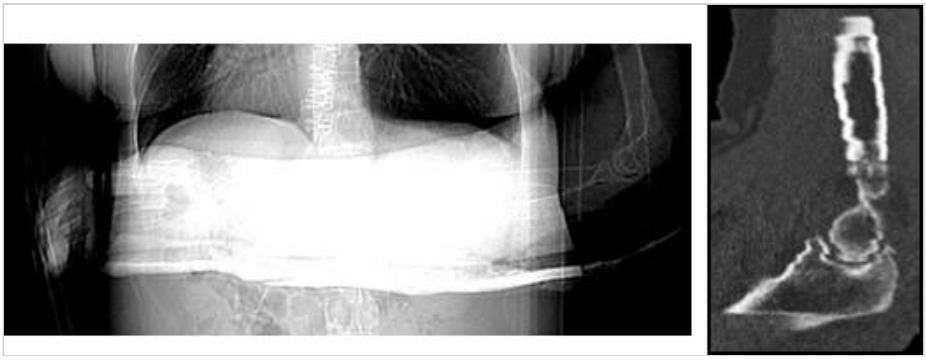
- The elbow should be as straight as possible. (Fully extended)
- The arm should be supinated (palm up), causing the radius/ulna to be uncrossed.
- It helps to have the patient bend their head away from the elbow. Watch to make sure the patient's head doesn't hit the edge of scanner!

If the patient's elbow is in a cast:

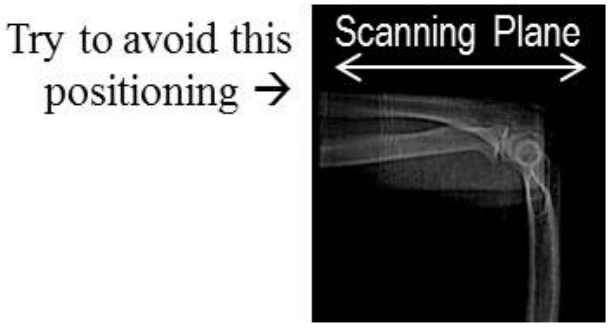
- Every effort should be made to position the elbow above the head.
- Try to avoid positioning forearm bones parallel to scanning plane. This causes beam hardening artifacts along entire length of radius & ulna. It is better to have forearm oblique to the scanning plane.
- The arm should not be across the patient's body. This yields undesirable beam hardening artifacts from the torso, while it also causes unnecessary radiation to the torso.

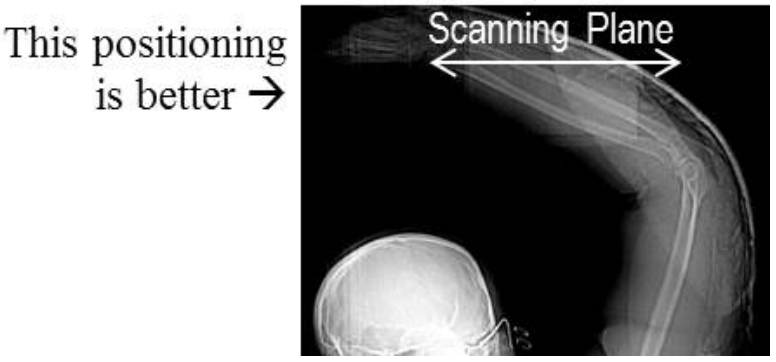
If the arm cannot be raised above the head, **USE THE SHOULDER PROTOCOL WITH THE PATIENT'S ARM AT THIER SIDE** and create the same reformats of the elbow as if you had scanned using the elbow protocol. Having the elbow "half up" sitting next to the head is worse than having the elbow at the patients side. If the relative position of the elbow joint is important for the scan, please consult a radiologist for positioning guidance. If possible, place the contralateral arm above the head, if the patient cannot do that, it is okay to have the contralateral arm "half up" near the head since you will not be scanning that arm.

Respiratory motion will produce unacceptable reformatting artifacts (see below).



Effects of beam hardening and respiratory motion





IV Contrast Parameters 350

Medrad™ P3T Abdomen protocol, Ulrich Routine Body Adult, or UW ConCal for weight based contrast.

Iohexol (Omnipaque) 350 mg/mL injection at a rate of 3 mL/sec

Rate: As appropriate for IV access (up to 3mL/sec)

Delay: 90sec

For sites without the Medrad™ P3T or UW ConCal option, refer to the weight based contrast tables we provide in the protocol booklet.

IV Contrast Parameters 300/370

Medrad™ P3T Abdomen protocol.

Iohexol (Omnipaque) 300 mg/mL injection at a rate of 3 mL/sec

Rate: As appropriate for IV access (up to 3mL/sec)

Delay: 90sec

For sites without the Medrad™ P3T or P3T PA option, refer to the weight based contrast tables we provide in the protocol booklet.

Field of View

Preferred 22 cm

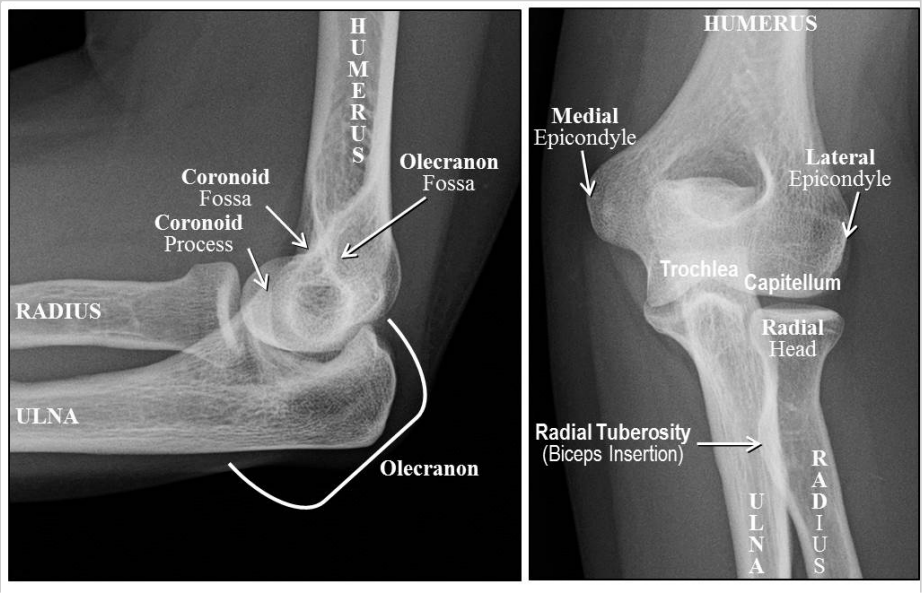
Scan Description

- Series 1 - PA and lateral scouts
- Series 2 - CT Elbow cover distal humerus through proximal forearm

Reformat Instructions

Elbow Anatomy:

- Lateral and AP views respectively



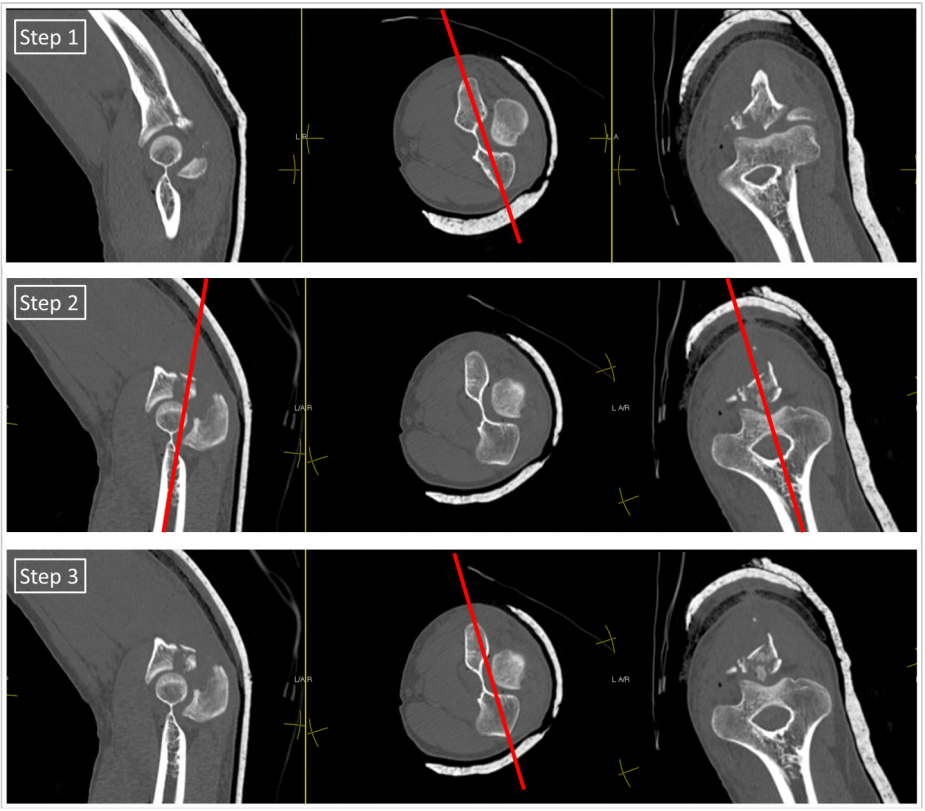
Elbow Anatomy

Reformatting: 2mm x 1 mm You may have anywhere from 3 to 6 reformats of the elbow depending on patient positioning. We need 3 views:

- Axial in respect to the humerus, radius and ulna. (may need two axials, one for the humerus and one for the radius/ulna)
- Sagittal in respect to the transepicondyler axis of the distal humerus. (usually only one reformat necessary)
- Coronal in respect to the transepicondyler axis of the distal humerus. (may need two axials, one for the humerus and one for the radius/ulna)

To achieve this, follow this 3-step process listed and pictured below to correct the elbow into the desired planes. Use the Multi-Oblique Reformatting Tool.

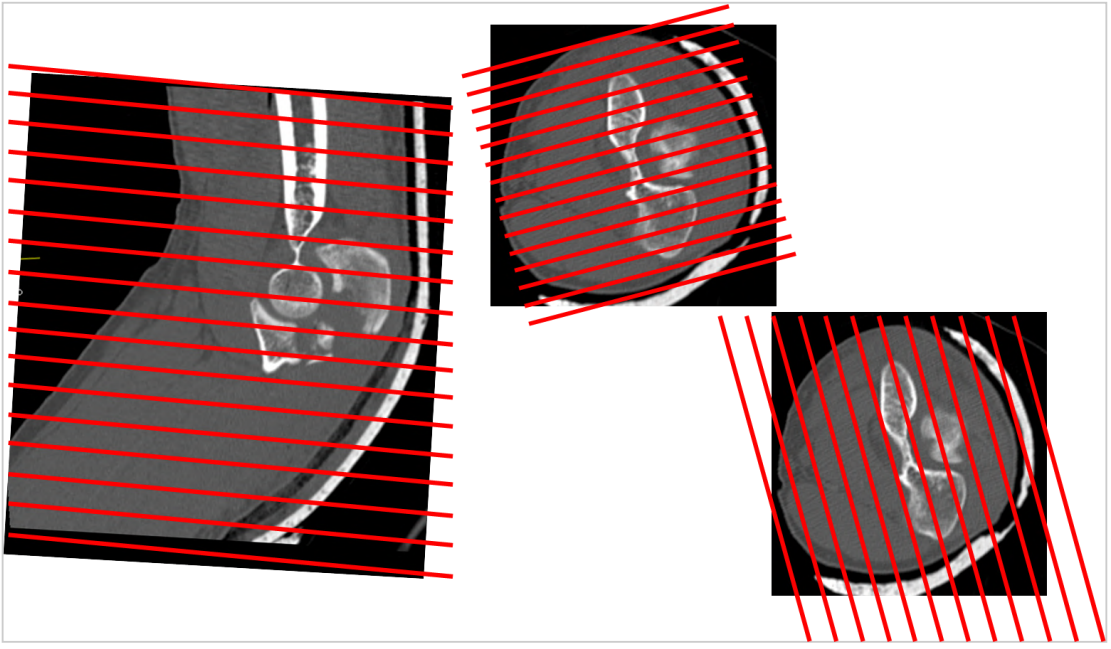
1. Using the axial images, align the coronal plane so that it is parallel to the transepicondylar axis of the distal humerus.
2. Align both the sagittal and coronal planes to be parallel to the shaft of the distal humerus.
3. Again use the axial images to fine tune the coronal plane to ensure that it is parallel to the transepicondylar axis of the distal humerus. Corresponding orthogonal views represent the sagittal and axial reformatting planes.



Elbow reformat instructions (guidance when using the multi-oblique reformatting tool)

Then, create your reformats off of these planes you just created as shown below.

1. Axial
2. Sagittal
3. Coronal



Reformat planes

- **If a HD/GSI Scan**: Recons & Reformats: Do all reformats specific for this protocol on the 140 keV BonePlus recon (QC is recon 1) and send to ALI_Store.

If a long bone scan (forearm ulna/radius) is ordered, do CO/SA/AX reformat in 2x1 mm using the thin bone series.

Reformats

For Adults and Pediatrics:

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
AX Humerus	Thin Bone	Manual	Average	2500/350	2	1	axial
CO Humerus	Thin Bone	Manual	Average	2500/350	2	1	coronal
SA Humerus	Thin Bone	Manual	Average	2500/350	2	1	sagittal
AX Forearm	Thin Bone	Manual	Average	2500/350	2	1	axial
CO Forearm	Thin Bone	Manual	Average	2500/350	2	1	coronal
SA Forearm	Thin Bone	Manual	Average	2500/350	2	1	sagittal
AX ST	Thin Soft Tissue	Manual	Average	450/50	2	1	axial

Networking

- All images are networked to PACS (ALI_Store).
- Note: If smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

Miscellaneous

None

Acquisition Parameters

If you have Hi-Res/HD mode: UW recommends turning Hi-Res mode "ON", but using the regular (i.e., non HD) kernels. HD kernels increase the image noise. See *Rubert, Nicholas, Timothy Szczykutowicz, and Frank Ranallo. "Improvement in CT image resolution due to the use of focal spot deflection and increased sampling." Journal of applied clinical medical physics 17, no. 3 (2016): 452-466.*

Series 1, Scout

Scout 1 kV	120
Scout 1 mA	10
Scout 1 Angle	180
Scout 2 kV	120
Scout 2 mA	40
Scout 2 Angle	90
WW/WL for Scout	500/50

Series 2, Scan Phase

Scan Type	**Helical**
Beam Collimation	**40**
Detector Rows	**64.0**
Detector Configuration	**64x0.625**
Scan FOV	**Large Body**
Pitch	**0.516**
Speed (mm/rot)	**20.60**
Rotation Time (s)	**0.9**
kV	**100**
AEC type	**Manual mA**
mA Range	**(40-320)**
Manual mA	**200.0**
Noise Index	**13.0**
Slice Thickness (mm)	**0.625**
Interval (mm)	**0.312**

Series 2, Recons

Recon 1 (Primary)	No Metal
DFOV	**22**
Recon Type	**Bone Plus**
WW/WL	**2500/350**
Recon Option	**Plus**
Recon Option	**IQ Enhance**
ASiR/ASiR256/DLIR	
Slice Thickness (mm)	**0.625**
Interval (mm)	**0.312**
Recon 2 (Secondary)	
DFOV	**22**
Recon Type	**Standard**
WW/WL	**450/50**
Recon Option	**Plus**
Recon Option	**IQ Enhance**
ASiR/ASiR256/DLIR	**40% / 20% / Medium**
Slice Thickness (mm)	**0.625**
Interval (mm)	**0.312**

Elbow/Forearm (with Metal) 4.7

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Pediatric Patients Under 13 years of age: See Appendix for Technique Instruction, Guidance for pediatric extremity MSK protocols

Indication

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.

Oral Contrast

None

Pre-Scan Instructions

Keys to Optimally Positioning the Elbow

The elbow is the most difficult joint to scan. It is usually a challange to optimally position the elbow, particularly when the elbow is in a cast. The better the elbow is positioned in the scanner, the easier it will be to make the reformats.

Ideally, the arm should be raised above the patient's head. This is best achieved with the patient laying supine on the table. Sometimes creative positioning (prone, decubitus) will be necessary. Proper positioning is crucial for a couple reasons:

- It puts the elbow near the center of the scanner (allowing use of "Small SFOV").
- It avoids radiation to the head and torso.

If the patient's elbow is not in a cast:

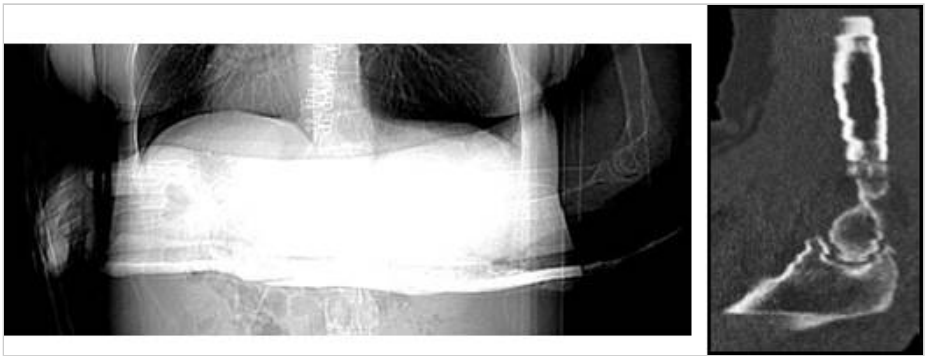
- The elbow should be as straight as possible. (Fully extended)
- The arm should be supinated (palm up), causing the radius/ulna to be uncrossed.
- It helps to have the patient bend their head away from the elbow. Watch to make sure the patient's head doesn't hit the edge of scanner!

If the patient's elbow is in a cast:

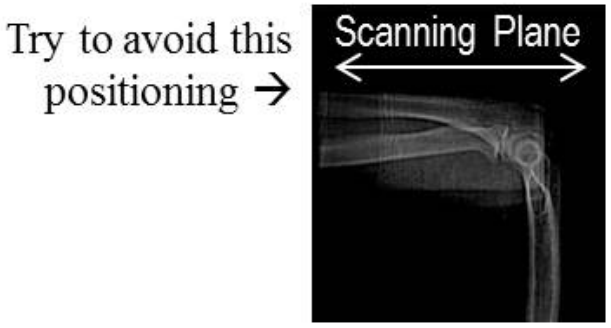
- Every effort should be made to position the elbow above the head.
- Try to avoid positioning forearm bones parallel to scanning plane. This causes beam hardening artifacts along entire length of radius & ulna. It is better to have forearm oblique to the scanning plane.
- The arm should not be across the patient's body. This yields undesirable beam hardening artifacts from the torso, while it also causes unnecessary radiation to the torso.

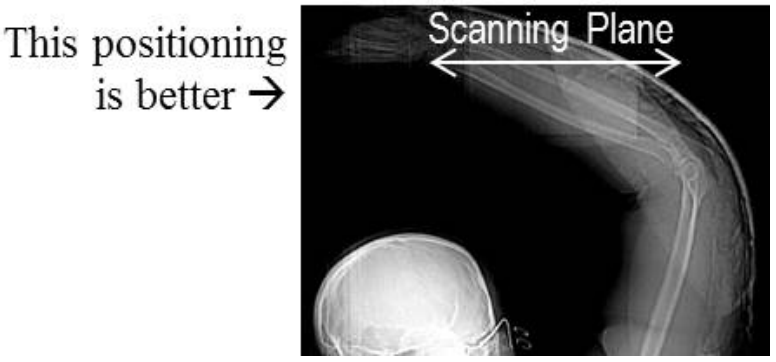
If the arm cannot be raised above the head, **USE THE SHOULDER PROTOCOL WITH THE PATIENT'S ARM AT THIER SIDE** and create the same reformats of the elbow as if you had scanned using the elbow protocol. Having the elbow "half up" sitting next to the head is worse than having the elbow at the patients side. If the relative position of the elbow joint is important for the scan, please consult a radiologist for positioning guidance. If possible, place the contralateral arm above the head, if the patient cannot do that, it is okay to have the contralateral arm "half up" near the head since you will not be scanning that arm.

Respiratory motion will produce unacceptable reformatting artifacts (see below).



Effects of beam hardening and respiratory motion





IV Contrast Parameters 350

Medrad™ P3T Abdomen protocol, Ulrich Routine Body Adult, or UW ConCal for weight based contrast.

Iohexol (Omnipaque) 350 mg/mL injection at a rate of 3 mL/sec

Rate: As appropriate for IV access (up to 3mL/sec)

Delay: 90sec

For sites without the Medrad™ P3T or UW ConCal option, refer to the weight based contrast tables we provide in the protocol booklet.

IV Contrast Parameters 300/370

Medrad™ P3T Abdomen protocol.

Iohexol (Omnipaque) 300 mg/mL injection at a rate of 3 mL/sec

Rate: As appropriate for IV access (up to 3mL/sec)

Delay: 90sec

For sites without the Medrad™ P3T or P3T PA option, refer to the weight based contrast tables we provide in the protocol booklet.

Field of View

Preferred 22 cm

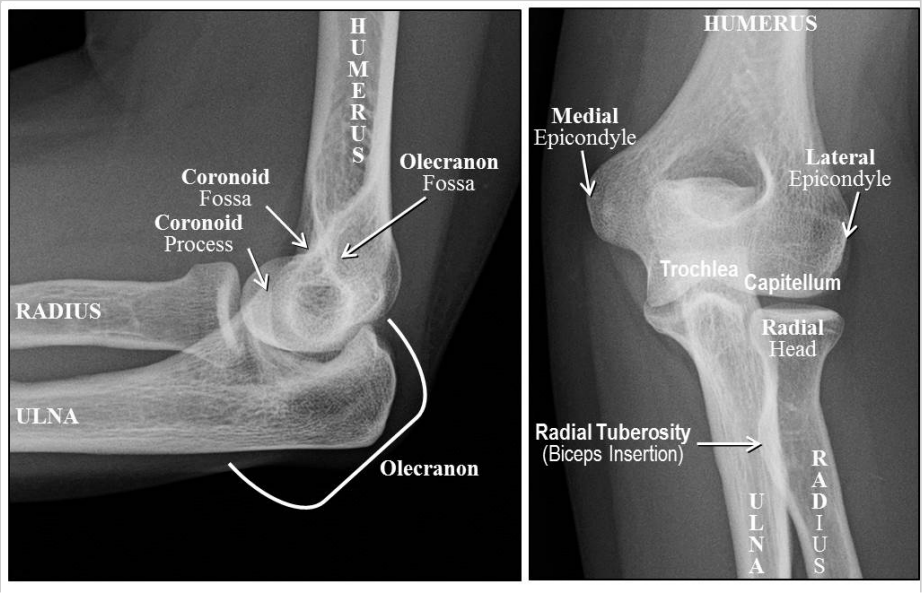
Scan Description

- Series 1 - PA and lateral scouts
- Series 2 - CT Elbow cover distal humerus through proximal forearm

Reformat Instructions

Elbow Anatomy:

- Lateral and AP views respectively



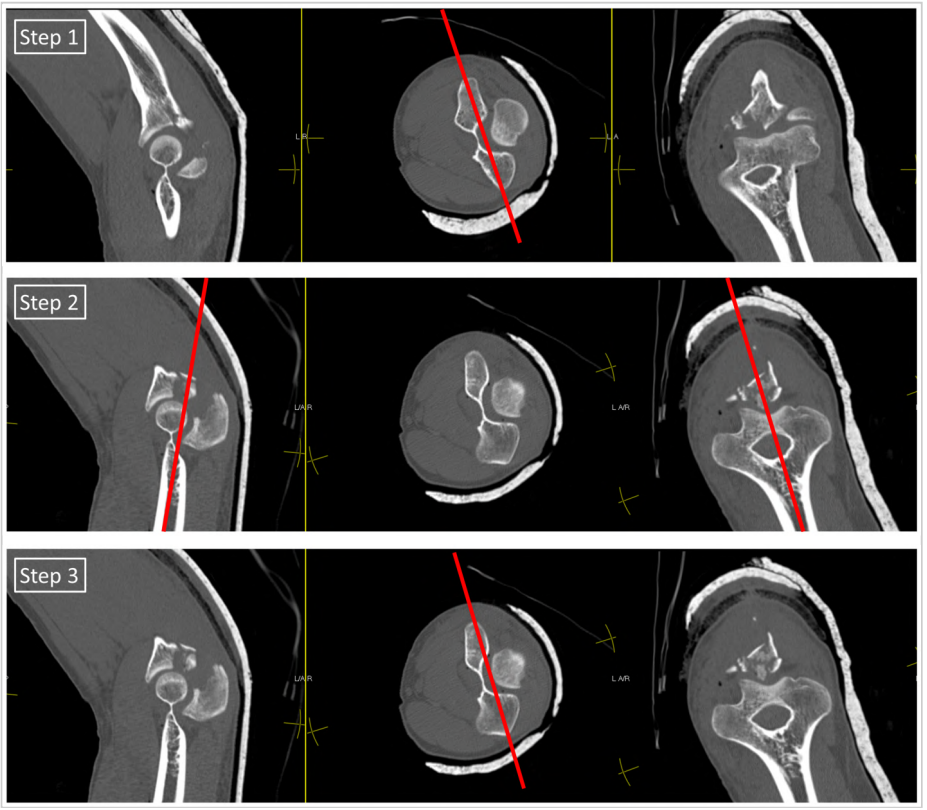
Elbow Anatomy

Reformatting: 2mm x 1 mm You may have anywhere from 3 to 6 reformats of the elbow depending on patient positioning. We need 3 views:

- Axial in respect to the humerus, radius and ulna. (may need two axials, one for the humerus and one for the radius/ulna)
- Sagittal in respect to the transepicondyler axis of the distal humerus. (usually only one reformat necessary)
- Coronal in respect to the transepicondyler axis of the distal humerus. (may need two axials, one for the humerus and one for the radius/ulna)

To achieve this, follow this 3-step process listed and pictured below to correct the elbow into the desired planes. Use the Multi-Oblique Reformatting Tool.

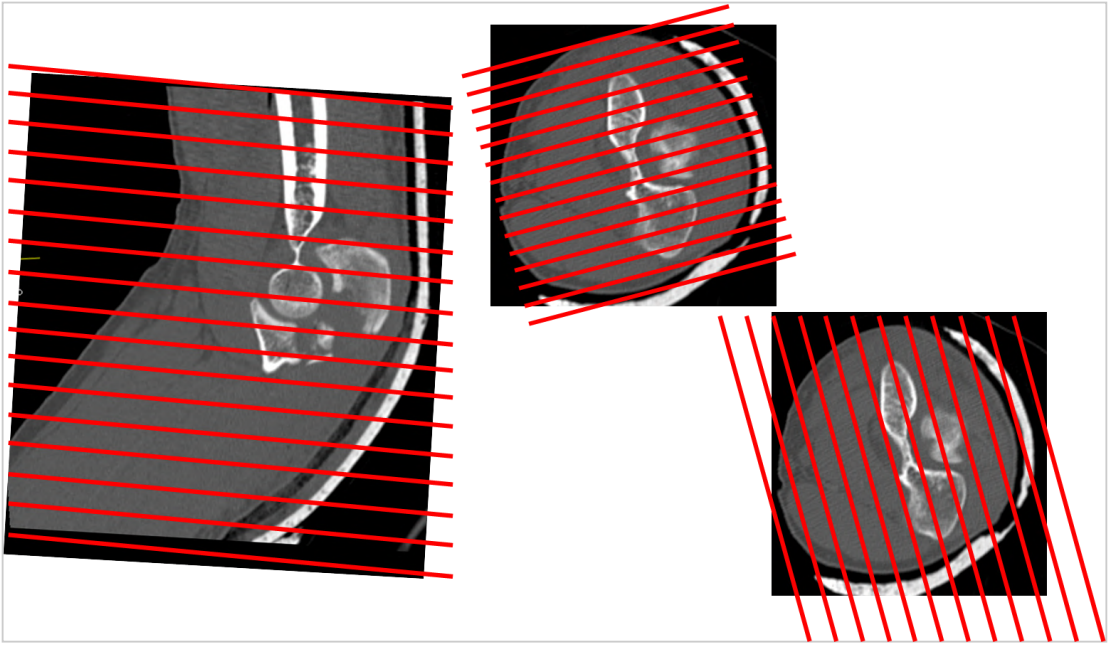
1. Using the axial images, align the coronal plane so that it is parallel to the transepicondylar axis of the distal humerus.
2. Align both the sagittal and coronal planes to be parallel to the shaft of the distal humerus.
3. Again use the axial images to fine tune the coronal plane to ensure that it is parallel to the transepicondylar axis of the distal humerus. Corresponding orthogonal views represent the sagittal and axial reformatting planes.



Elbow reformat instructions (guidance when using the multi-oblique reformatting tool)

Then, create your reformats off of these planes you just created as shown below.

1. Axial
2. Sagittal
3. Coronal



Reformat planes

- **If a HD/GSI Scan**: Recons & Reformats: Do all reformats specific for this protocol on the 140 keV BonePlus recon (QC is recon 1) and send to ALI_Store.

If a long bone scan (forearm ulna/radius) is ordered, do CO/SA/AX reformat in 2x1 mm using the thin bone series.

Reformats

For Adults and Pediatrics:

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
AX Humerus	Thin Bone	Manual	Average	2500/350	2	1	axial
CO Humerus	Thin Bone	Manual	Average	2500/350	2	1	coronal
SA Humerus	Thin Bone	Manual	Average	2500/350	2	1	sagittal
AX Forearm	Thin Bone	Manual	Average	2500/350	2	1	axial
CO Forearm	Thin Bone	Manual	Average	2500/350	2	1	coronal
SA Forearm	Thin Bone	Manual	Average	2500/350	2	1	sagittal
AX ST	Thin Soft Tissue	Manual	Average	450/50	2	1	axial

Networking

- All images are networked to PACS (ALI_Store).
- Note: If smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

Miscellaneous

None

Acquisition Parameters

If you have Hi-Res/HD mode: UW recommends turning Hi-Res mode "ON", but using the regular (i.e., non HD) kernels. HD kernels increase the image noise. See *Rubert, Nicholas, Timothy Szczykutowicz, and Frank Ranallo. "Improvement in CT image resolution due to the use of focal spot deflection and increased sampling." Journal of applied clinical medical physics 17, no. 3 (2016): 452-466.*

Series 1, Scout

Scout 1 kV	140
Scout 1 mA	10
Scout 1 Angle	180
Scout 2 kV	140
Scout 2 mA	40
Scout 2 Angle	90
WW/WL for Scout	500/50

Series 2, Scan Phase

Scan Type	Helical
Beam Collimation	40
Detector Rows	64.0
Detector Configuration	64x0.625
Scan FOV	Large Body
Pitch	0.516
Speed (mm/rot)	20.60
Rotation Time (s)	1
kV	140
AEC type	Manual mA
mA Range	(80-515)
Manual mA	380.0
Noise Index	9.0
Slice Thickness (mm)	0.625
Interval (mm)	0.312

Series 2, Recons

Recon 1 (Primary)	
DFOV	22
Recon Type	Bone Plus
WW/WL	2500/350
Recon Option	Plus
Recon Option	IQ Enhance
ASiR/ASiR256/DLIR	
Slice Thickness (mm)	0.625
Interval (mm)	0.312
Recon 2 (Secondary)	
DFOV	22
Recon Type	Standard
WW/WL	450/50
Recon Option	Plus
Recon Option	IQ Enhance
ASiR/ASiR256/DLIR	40% / 20% / Medium
Slice Thickness (mm)	0.625
Interval (mm)	0.312

If your Scanner has MAR software, turn this additional recon "ON" in the presence of metal.

Recon 3 (Secondary)	MAR
DFOV	22
Recon Type	Standard
WW/WL	450/50
Recon Option	Plus
Recon Option	IQ Enhance
Recon Option	MARS On
ASiR/ASiR256/DLIR	40% / 20% / Medium
Slice Thickness (mm)	0.625
Interval (mm)	0.312

Wrist (without Metal) 4.8

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Pediatric Patients Under 13 years of age: See Appendix for Technique Instruction, Guidance for pediatric extremity MSK protocols

Indication

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.

Oral Contrast

None

Pre-Scan Instructions

- Arm over head
  - For most patients, this is best achieved prone (Alternatively, try decubitus positioning)
- Arm should be as straight as possible.
  - If the patient is in a long arm cast it will not be possible to completely straighten the arm.
- Wrist centered in gantry.
- No gantry tilt.

wrist positioning

- If the arm cannot be raised above the head, **USE THE SHOULDER PROTOCOL WITH THE PATIENT'S ARM AT THIER SIDE** and create the same reformats of the wrist as if you had scanned using the wrist protocol. Having the wrist "half up" sitting next to the head is worse than having the wrist at the patients side. If the relative position of the wrist joint is important for the scan, please consult a radiologist for positioning guidance. If possible, place the contralateral arm above the head, if the patient cannot do that, it is okay to have the contralateral arm "half up" near the head since you will not be scanning that arm.

IV Contrast Parameters 350

Medrad™ P3T Abdomen protocol, Ulrich Routine Body Adult, or UW ConCal for weight based contrast.

Iohexol (Omnipaque) 350 mg/mL injection at a rate of 3 mL/sec

Rate: As appropriate for IV access (up to 3mL/sec)

Delay: 90sec

For sites without the Medrad™ P3T or UW ConCal option, refer to the weight based contrast tables we provide in the protocol booklet.

IV Contrast Parameters 300/370

Medrad™ P3T Abdomen protocol.

Iohexol (Omnipaque) 300 mg/mL injection at a rate of 3 mL/sec

Rate: As appropriate for IV access (up to 3mL/sec)

Delay: 90sec

For sites without the Medrad™ P3T or P3T PA option, refer to the weight based contrast tables we provide in the protocol booklet.

Field of View

12 cm

Scan Description

- Series 1 - PA and lateral scouts
- Series 2 - CT wrist
    - Wrist Coverage
        - When scanning the wrist
            - Always start proximal to the DRUJ (Distal Radial-Ulnar Joint)
            - Always scan distal to C-MC joints (Carpal-MetaCarpal joints)
        - When scanning the hand
            - Always start proximal to the DRUJ
            - Scan through the area of interest (This should be determined by the radiologist)

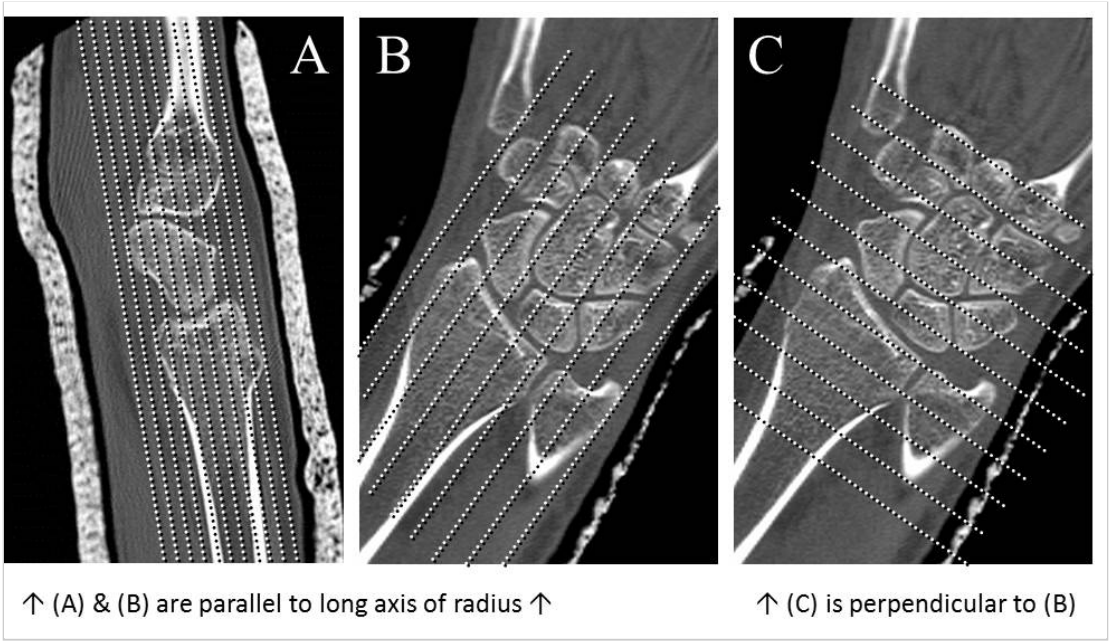
Wrist coverage example

Reformat Instructions

- Use the Bone Recon for the CO/SA/AX
- Use the Standard Recon for one additional AX ST reformat.
- Wrist CTs should be reformatted in at least the basic 3 orthogonal planes – See images A, B, & C.
- In addition, an Oblique Axial Standard reformat parallel to the distal articular surface of the radius should be performed- See image E.
- In rare circumstances, such as for DRUJ instability, the radiologist may indicate that no reformats are necessary. See shaded box below.
- If the indication is to evaluate the “Scaphoid” or “Navicular,” then also reformat in the 4th plane, the oblique sagittal plane – See image D.
- If the wrist was obliqued in the scanner, the reference images will need to be obliqued to yield “True Sagittal” and “True Coronal” planes.

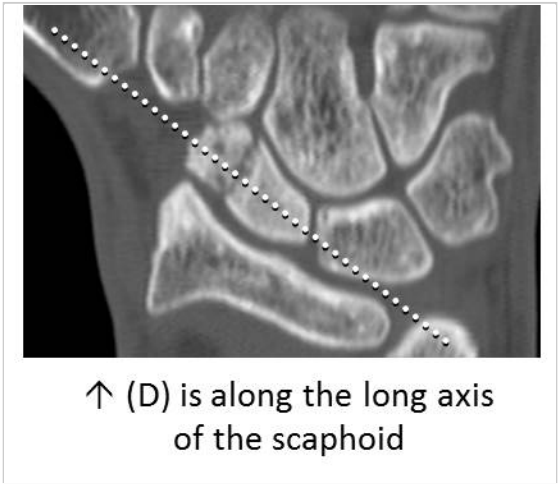
In order from left:

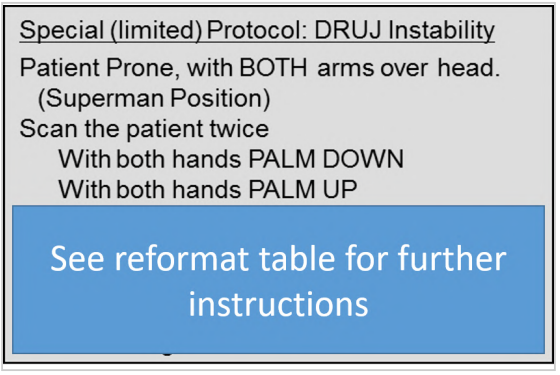
- Coronal with a standard of 2x1mm, made off a true sagittal
- Sagittal with a standard of 2x1mm, made off a true coronal
- Axial with a standard of 2x1mm, made of a true coronal



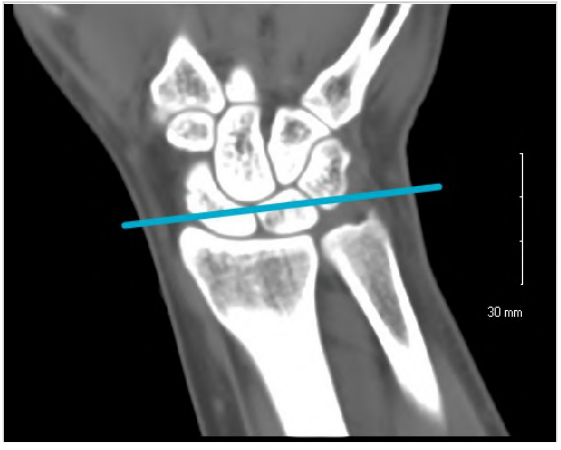
Reformats A,B and C

- The next photo, **D**, is of an oblique sagittal 1x1mm made off a true coronal
- For **E**, 1x.5mm STANDARD. Oblique Axial reformat parallel to the distal articular surface of the radius.





Special instructions



(E) ST Wrist reformat

2D Reformats

- Reformats in 3 or 4 planes
- Annotate as to "Right" or "Left".
- **If a HD/GSI Scan**: Recons & Reformats: Do all reformats specific for this protocol on the 140 keV BonePlus recon (QC is recon 1) and send to ALI_Store.

Reformats

For Adults and Pediatrics:

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
CO	Thin Bone	Manual	Average	2500/350	2	1	coronal
SA	Thin Bone	Manual	Average	2500/350	2	1	sagittal
AX	Thin Bone	Manual	Average	2500/350	2	1	axial
AX ST	Thin Soft Tissue	Manual	Average	450/50	2	1	axial

For Navicular FX

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
OBL SA	Thin Bone	Manual	Average	2500/350	1	0.5	sagittal

For Distal Radius FX

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
OBL SA	Thin Bone	Manual	Average	2500/350	1	0.5	sagittal

For when a DRUJ wrist is ordered

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
AX	Thin Soft Tissue	Manual	Average	450/50	2	1	axial
CO	Thin Soft Tissue	Manual	Average	450/50	2	1	coronal
SA	Thin Soft Tissue	Manual	Average	450/50	2	1	sagittal

Networking

- All images are networked to PACS (ALI_Store).
- Note: If smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

Miscellaneous

None

Acquisition Parameters

If you have Hi-Res/HD mode: UW recommends turning Hi-Res mode "ON", but using the regular (i.e., non HD) kernels. HD kernels increase the image noise. See *Rubert, Nicholas, Timothy Szczykutowicz, and Frank Ranallo. "Improvement in CT image resolution due to the use of focal spot deflection and increased sampling." Journal of applied clinical medical physics 17, no. 3 (2016): 452-466.*

Series 1, Scout

Scout 1 kV	**100**
Scout 1 mA	**10**
Scout 1 Angle	**180**
Scout 2 kV	**100**
Scout 2 mA	**40**
Scout 2 Angle	**90**
WW/WL for Scout	**500/50**

Series 2, Scan Phase

Scan Type	**Helical**
Beam Collimation	**40**
Detector Rows	**64.0**
Detector Configuration	**64x0.625**
Scan FOV	**Small Body**
Pitch	**0.516**
Speed (mm/rot)	**20.60**
Rotation Time (s)	**0.9**
kV	**100**
AEC type	**Manual mA**
mA Range	**(40-320)**
Manual mA	**200.0**
Noise Index	**13.0**
Slice Thickness (mm)	**0.625**
Interval (mm)	**0.312**

Series 2, Recons

	No Metal
Recon 1 (Primary)	
DFOV	**12**
Recon Type	**Bone Plus**
WW/WL	**2500/350**
Recon Option	**Plus**
Recon Option	**IQ Enhance**
ASiR/ASiR256/DLIR	
Slice Thickness (mm)	**0.625**
Interval (mm)	**0.312**
Recon 2 (Secondary)	
DFOV	**12**
Recon Type	**Standard**
WW/WL	**450/50**
Recon Option	**Plus**
Recon Option	**IQ Enhance**
ASiR/ASiR256/DLIR	**40% / 20% / Medium**
Slice Thickness (mm)	**0.625**
Interval (mm)	**0.312**

Wrist (with Metal) 4.9

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Pediatric Patients Under 13 years of age: See Appendix for Technique Instruction, Guidance for pediatric extremity MSK protocols

Indication

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.

Oral Contrast

None

Pre-Scan Instructions

- Arm over head
  - For most patients, this is best achieved prone (Alternatively, try decubitus positioning)
- Arm should be as straight as possible.
  - If the patient is in a long arm cast it will not be possible to completely straighten the arm.
- Wrist centered in gantry.
- No gantry tilt.

wrist positioning

- If the arm cannot be raised above the head, **USE THE SHOULDER PROTOCOL WITH THE PATIENT'S ARM AT THIER SIDE** and create the same reformats of the wrist as if you had scanned using the wrist protocol. Having the wrist "half up" sitting next to the head is worse than having the wrist at the patients side. If the relative position of the wrist joint is important for the scan, please consult a radiologist for positioning guidance. If possible, place the contralateral arm above the head, if the patient cannot do that, it is okay to have the contralateral arm "half up" near the head since you will not be scanning that arm.

IV Contrast Parameters 350

Medrad™ P3T Abdomen protocol, Ulrich Routine Body Adult, or UW ConCal for weight based contrast.

Iohexol (Omnipaque) 350 mg/mL injection at a rate of 3 mL/sec

Rate: As appropriate for IV access (up to 3mL/sec)

Delay: 90sec

For sites without the Medrad™ P3T or UW ConCal option, refer to the weight based contrast tables we provide in the protocol booklet.

IV Contrast Parameters 300/370

Medrad™ P3T Abdomen protocol.

Iohexol (Omnipaque) 300 mg/mL injection at a rate of 3 mL/sec

Rate: As appropriate for IV access (up to 3mL/sec)

Delay: 90sec

For sites without the Medrad™ P3T or P3T PA option, refer to the weight based contrast tables we provide in the protocol booklet.

Field of View

12 cm

Scan Description

- Series 1 - PA and lateral scouts
- Series 2 - CT wrist
    - Wrist Coverage
        - When scanning the wrist
            - Always start proximal to the DRUJ (Distal Radial-Ulnar Joint)
            - Always scan distal to C-MC joints (Carpal-MetaCarpal joints)
        - When scanning the hand
            - Always start proximal to the DRUJ
            - Scan through the area of interest (This should be determined by the radiologist)

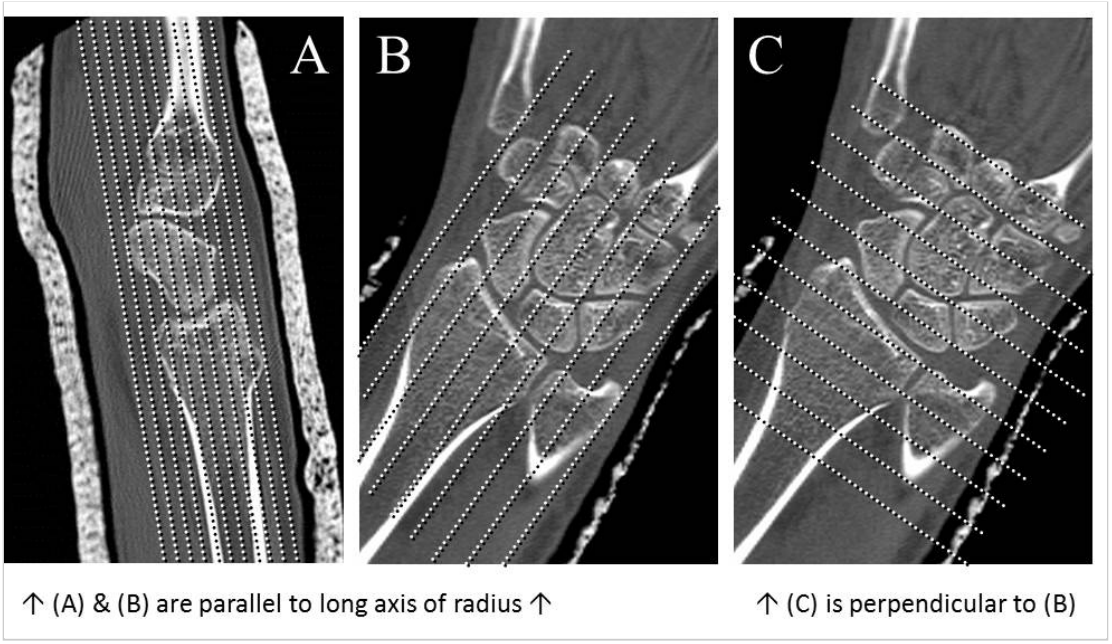
Wrist coverage example

Reformat Instructions

- Use the Bone Recon for the CO/SA/AX
- Use the Standard Recon for one additional AX ST reformat.
- Wrist CTs should be reformatted in at least the basic 3 orthogonal planes – See images A, B, & C.
- In addition, an Oblique Axial Standard reformat parallel to the distal articular surface of the radius should be performed- See image E.
- In rare circumstances, such as for DRUJ instability, the radiologist may indicate that no reformats are necessary. See shaded box below.
- If the indication is to evaluate the "Scaphoid" or "Navicular," then also reformat in the 4th plane, the oblique sagittal plane – See image D.
- If the wrist was obliqued in the scanner, the reference images will need to be obliqued to yield "True Sagittal" and "True Coronal" planes.

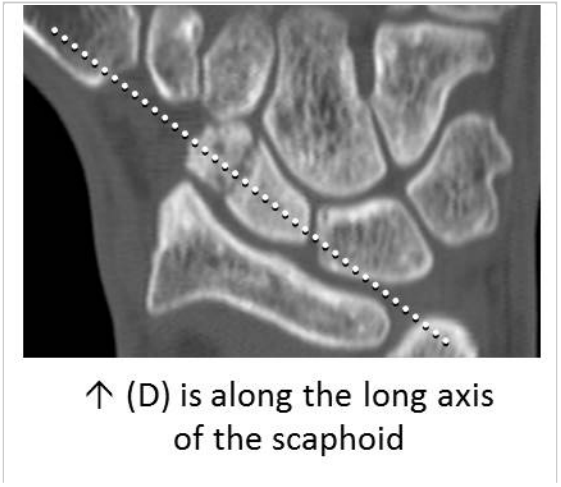
In order from left:

- Coronal with a standard of 2x1mm, made off a true sagittal
- Sagittal with a standard of 2x1mm, made off a true coronal
- Axial with a standard of 2x1mm, made of a true coronal



Reformats A,B and C

- The next photo, **D**, is of an oblique sagittal 1x1mm made off a true coronal
- For **E**, 1x.5mm STANDARD. Oblique Axial reformat parallel to the distal articular surface of the radius.

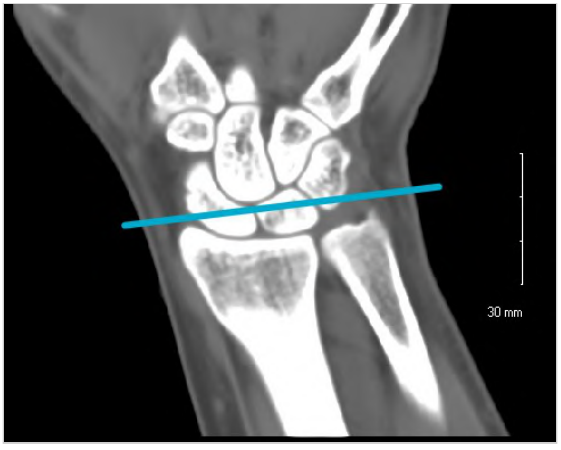


Special (limited) Protocol: DRUJ Instability

Patient Prone, with BOTH arms over head.
(Superman Position)
Scan the patient twice
With both hands PALM DOWN
With both hands PALM UP

See reformat table for further instructions

Special instructions



(E) ST Wrist reformat

2D Reformats

- Reformats in 3 or 4 planes
- Annotate as to "Right" or "Left".
- **If a HD/GSI Scan**: Recons & Reformats: Do all reformats specific for this protocol on the 140 keV BonePlus recon (QC is recon 1) and send to ALI_Store.

Reformats

For Adults and Pediatrics:

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
CO	Thin Bone	Manual	Average	2500/350	2	1	coronal
SA	Thin Bone	Manual	Average	2500/350	2	1	sagittal
AX	Thin Bone	Manual	Average	2500/350	2	1	axial
AX ST	Thin Soft Tissue	Manual	Average	450/50	2	1	axial

For Navicular FX

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
OBL SA	Thin Bone	Manual	Average	2500/350	1	0.5	sagittal

For Distal Radius FX

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
OBL SA	Thin Bone	Manual	Average	2500/350	1	0.5	sagittal

For when a DRUJ wrist is ordered

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
AX	Thin Soft Tissue	Manual	Average	450/50	2	1	axial
CO	Thin Soft Tissue	Manual	Average	450/50	2	1	coronal
SA	Thin Soft Tissue	Manual	Average	450/50	2	1	sagittal

Networking

- All images are networked to PACS (ALI_Store).
- Note: If smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

Miscellaneous

None

Acquisition Parameters

If you have Hi-Res/HD mode: UW recommends turning Hi-Res mode "ON", but using the regular (i.e., non HD) kernels. HD kernels increase the image noise. See *Rubert, Nicholas, Timothy Szczykutowicz, and Frank Ranallo. "Improvement in CT image resolution due to the use of focal spot deflection and increased sampling." Journal of applied clinical medical physics 17, no. 3 (2016): 452-466.*

Series 1, Scout

Scout 1 kV	140
Scout 1 mA	10
Scout 1 Angle	180
Scout 2 kV	140
Scout 2 mA	40
Scout 2 Angle	90
WW/WL for Scout	500/50

Series 2, Scan Phase

Scan Type	Helical
Beam Collimation	40
Detector Rows	64.0
Detector Configuration	64x0.625
Scan FOV	Small Body
Pitch	0.516
Speed (mm/rot)	20.60
Rotation Time (s)	1
kV	140
AEC type	Manual mA
mA Range	(80-515)
Manual mA	380.0
Noise Index	9.0
Slice Thickness (mm)	0.625
Interval (mm)	0.312

Series 2, Recons

	With Metal
Recon 1 (Primary)	
DFOV	12
Recon Type	Bone Plus
WW/WL	2500/350
Recon Option	Plus
Recon Option	IQ Enhance
ASiR/ASiR256/DLIR	
Slice Thickness (mm)	0.625
Interval (mm)	0.312
Recon 2 (Secondary)	
DFOV	12
Recon Type	Standard
WW/WL	450/50
Recon Option	Plus
Recon Option	IQ Enhance
ASiR/ASiR256/DLIR	40% / 20% / Medium
Slice Thickness (mm)	0.625
Interval (mm)	0.312

If your Scanner has MAR software, turn this additional recon "ON" in the presence of metal.

Recon 3 (Secondary)	MAR
DFOV	12
Recon Type	Standard
WW/WL	450/50
Recon Option	Plus
Recon Option	IQ Enhance
Recon Option	MARS On
ASiR/ASiR256/DLIR	40% / 20% / Medium
Slice Thickness (mm)	0.625
Interval (mm)	0.312

Chest Wall/Clavicle/AC Joint/SC Joint/Sternum/Ribs 4.13/4.14/4.15

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Pediatric Patients Under 13 years of age: See Appendix for Technique Instruction, Guidance for pediatric extremity MSK protocols

Indication

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.

Oral Contrast

None

Pre-Scan Instructions

If doing clavicle, AC or SC joints, arms should be down. If doing chest wall, sternum or ribs, arms should be up. Please remember to have the patient hold their breath for this scan.

IV Contrast Parameters 350

Medrad™ P3T Abdomen protocol, Ulrich Routine Body Adult, or UW ConCal for weight based contrast.

Iohexol (Omnipaque) 350 mg/mL injection at a rate of 3 mL/sec

Rate: As appropriate for IV access (up to 3mL/sec)

Delay: 90sec

For sites without the Medrad™ P3T or UW ConCal option, refer to the weight based contrast tables we provide in the protocol booklet.

IV Contrast Parameters 300/370

Medrad™ P3T Abdomen protocol.

Iohexol (Omnipaque) 300 mg/mL injection at a rate of 3 mL/sec

Rate: As appropriate for IV access (up to 3mL/sec)

Delay: 90sec

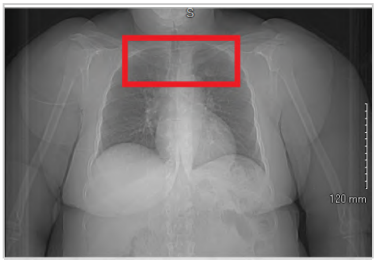
For sites without the Medrad™ P3T or P3T PA option, refer to the weight based contrast tables we provide in the protocol booklet.

Field of View

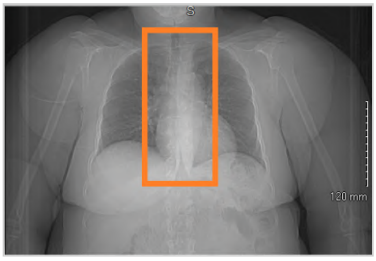
Variable, see scan description.

Scan Description

- Series 1 - PA and lateral scouts
- Series 2 - Helical Scan
  - Coverage:
    - **SC Joint and Sternum**
      - FOV should extend 5 cm laterally on each side of the sternum.

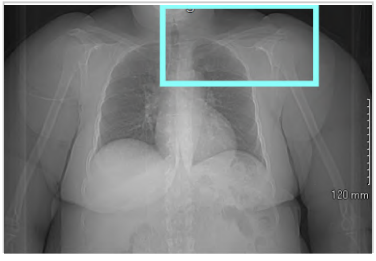


SC Joint



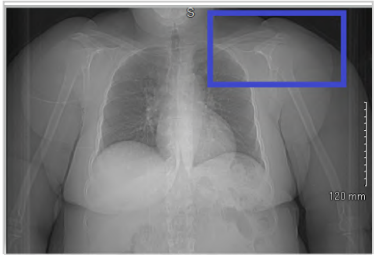
Sternum

- **Clavicle**
  - FOV should extend 5 cm laterally past the sternum and extend laterally past the AC joint.



Clavicle

- **AC Joint**
  - FOV should be mid clavicle to past the AC joint laterally.



AC Joints

- **Ribs**
  - The entire chest skin to skin should be covered and include all 12 ribs.
    - Note: if both AC joints/clavicle etc. are ordered, do not do 2 separate scans. If both sides are ordered, perform separate recons for each side using the same acquisition data.

Reformat Instructions

- All reformats will be 2 by 1 mm.
- For the clavicle: need a view along the long axis of the bone (Coronal) and perpendicular to the long axis of the bone (Sagittal), and an axial plane aligned to the body of the clavicle.
- For the AC and SC joints, the AX, SA, and CO should all be relative to the plane of the joint.
- For the chest wall, sternum, and ribs, the reformat planes should be aligned to the patient.

- **If a HD/GSI Scan**: Recons & Reformats: Do all reformats specific for this protocol on the 140 keV BonePlus recon (QC is recon 1) and send to ALI_Store.

Reformats

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
AX	Thin Bone	Manual	Average	3000/300	2	1	axial
CO	Thin Bone	Manual	Average	2500/350	2	1	coronal
SA	Thin Bone	Manual	Average	2500/350	2	1	sagittal

Networking

- All images are networked to PACS (ALI_Store).
- Note: If smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

Miscellaneous

None

Acquisition Parameters

Series 1, Scout

	Small	Medium	Large
Scout 1 kV	140	140	140
Scout 1 mA	10	10	10
Scout 1 Angle	180	180	180
Scout 2 kV	140	140	140
Scout 2 mA	80	80	80
Scout 2 Angle	90	90	90
WW/WL for Scout	500/50	500/50	500/50

Series 2, Scan Phase

	Small	Medium	Large
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**40**	**40**	**40**
Detector Rows	**64.0**	**64.0**	**64.0**
Detector Configuration	**64x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Large Body**	**Large Body**	**Large Body**
Pitch	**0.516**	**0.516**	**0.516**
Speed (mm/rot)	**20.60**	**20.60**	**20.60**
Rotation Time (s)	**0.5**	**0.7**	**0.8**
kV	**140**	**140**	**140**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(40-320)**	**(45-430)**	**(45-500)**
Manual mA	**200.0**	**210.0**	**290.0**
Noise Index	**14.5**	**20.0**	**29.5**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Series 2, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**24**	**24**	**24**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**2500/350**	**2500/350**	**2500/350**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR			
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**
Recon 2 (Secondary)			
DFOV	**24**	**24**	**24**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

If your Scanner has MAR software, turn this additional recon "ON" in the presence of metal. If Metal

MAR	Small	Medium	Large
Recon 3 (Secondary)			
DFOV	**24**	**24**	**24**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
Recon Option	**MARS On**	**MARS On**	**MARS On**
ASiR/ASiR256/DLIR	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Bony Pelvis/Hips/SI/Femur/FAI (without Metal) 8.1/8.2/8.3

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Indication

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). Note: there are separate adult and pediatric protocols for bony pelvis and there is a separate adult femoral anteversion and pediatric SPICA protocol.

Oral Contrast

None

Pre-Scan Instructions

- Patient supine, legs flat on the table.
- No cushions/wedges under legs/feet.
- Turn the toes inward.

IV Contrast Parameters 350

Medrad™ P3T Abdomen protocol, Ulrich Routine Body Adult, or UW ConCal for weight based contrast.

Iohexol (Omnipaque) 350 mg/mL injection at a rate of 3 mL/sec

Rate: As appropriate for IV access (up to 3mL/sec)

Delay: 90sec

For sites without the Medrad™ P3T or UW ConCal option, refer to the weight based contrast tables we provide in the protocol booklet.

IV Contrast Parameters 300/370

Medrad™ P3T Abdomen protocol.

Iohexol (Omnipaque) 300 mg/mL injection at a rate of 3 mL/sec

Rate: As appropriate for IV access (up to 3mL/sec)

Delay: 90sec

For sites without the Medrad™ P3T or P3T PA option, refer to the weight based contrast tables we provide in the protocol booklet.

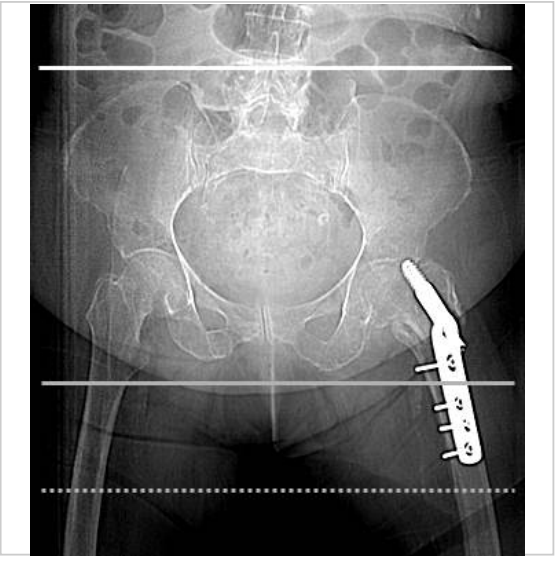
Field of View

Same as previous study or as small as appropriate

Scan Description

- Series 1 – PA and lateral scout

- Series 2 – CT Bony Pelvis
  - Coverage: (see picture)
  - From above iliac crests (white line)
  - To below lesser trochanters and below ischial tuberosities (gray line)
  - If hardware is present, cover the hardware and adjacent bone (dotted line)

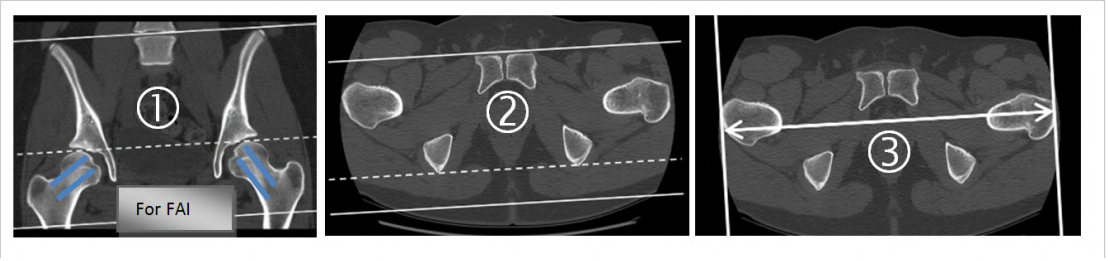


Bony Pelvis Scan Range

Reformat Instructions

Reformat slices 3mm Thick at 1.5mm Intervals in all 3 planes in the Bone Window unless specified to also do STD.

- Straight Axial Reformats
  - Set-up off a coronal image that shows both femoral heads.
  - Angle such that slices cut through femoral heads evenly (dotted line).
  - Cover from iliac crests through ischial tuberosities and lesser trochanters.
- Straight Coronal Reformats
  - Set-up off an axial image that shows pubic symphysis.
  - Angle slices through ischial tuberosities evenly (dotted line).
  - Cover from in front of the pubic symphysis to behind the gluteal muscles.
- Straight Sagittal Reformats
  - Can set-up off same axial image as above.
  - Cover continuously from the right hip to the left hip, including the sacrum.

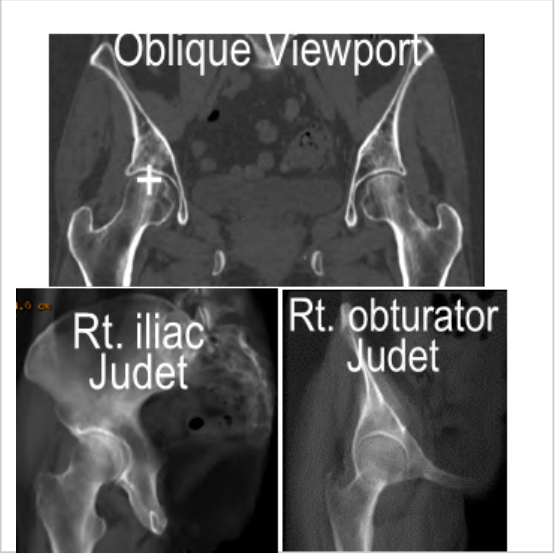


Reformat slices 3mm Thick at 1.5mm Intervals in all 3 planes
For "FAI" add oblique reformats parallel to femoral necks (blue lines)

Judet Views (For acetabular fractures)

- To reformat “Judet” views on GE CT scanner:

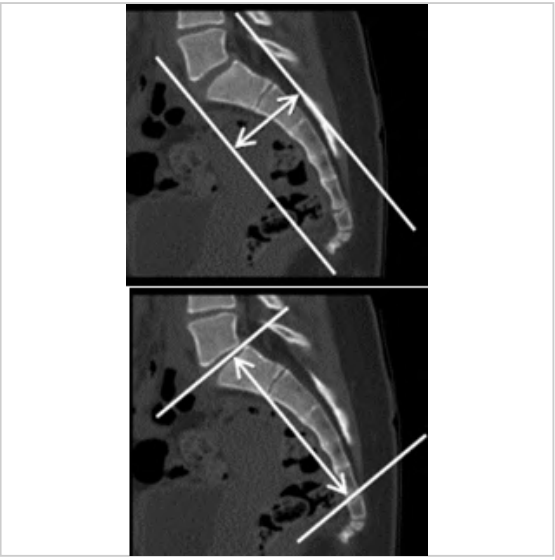
- Move reference to femoral head on oblique viewport
- Adjust slice thickness (middle mouse button) ~60mm
- Change “MIP” to “Average” (right mouse button)
- Set Window=2000, Level=350
- Hide Annotations (right mouse button)
- Click “Rotate/Translate” button. Can sometimes be hidden within “Display button” (blue box with the letter A) and set to 45 degrees
- Click to “Rotate to Left”
- Save Image (right mouse button)
- Click TWICE to rotate to center, then to right
- Save this image as well.
    - Repeat steps 7-10 for other hip. Send the 4 images.



Example of Judet reformating

SI Joints- Reformat 3mm Thick at 1.5mm Intervals

- Oblique Coronal Reformats
    - Set-up off a mid-line sagittal image through the sacrum.
    - Angle slices parallel to the long axis of the sacrum.
    - Cover the sacrum front-to-back. (Check the reformats to make sure the SI joints are covered in their entirety.)
- Oblique Axial Reformats
    - Set-up off same mid-sagittal image as above.
    - Angle slices to be perpendicular to the oblique coronals.
    - Cover the entire sacrum top-to-bottom.



SI joints for reformatting

- **If a HD/GSI Scan**: Recons & Reformats: Do all reformats specific for this protocol on the 140 keV BonePlus recon (QC is recon 1) and send to ALI_Store.

Reformats

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
AX	Thin Bone	Manual	Average	2500/350	3	1.5	axial
CO	Thin Bone	Manual	Average	2500/350	3	1.5	coronal
SA	Thin Bone	Manual	Average	2500/350	3	1.5	sagittal

Networking

- All images are networked to PACS (ALI_Store).
- Note: If smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

Miscellaneous

None.

Acquisition Parameters

Series 1, Scout

	Small	Medium	Large
Scout 1 kV	100	120	140
Scout 1 mA	10	10	10
Scout 1 Angle	180	180	180
Scout 2 kV	100	120	140
Scout 2 mA	40	40	80
Scout 2 Angle	90	90	90
WW/WL for Scout	500/50	500/50	500/50

Series 2, Scan Phase

	Small	Medium	Large
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**40**	**40**	**40**
Detector Rows	**64.0**	**64.0**	**64.0**
Detector Configuration	**64x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Large Body**	**Large Body**	**Large Body**
Pitch	**0.516**	**0.516**	**0.516**
Speed (mm/rot)	**20.60**	**20.60**	**20.60**
Rotation Time (s)	**0.5**	**0.7**	**0.8**
kV	**100**	**120**	**140**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(60-460)**	**(50-490)**	**(45-500)**
Manual mA	**290.0**	**250.0**	**290.0**
Noise Index	**20.0**	**23.0**	**29.5**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Series 2, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**30**	**40**	**50**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**2500/350**	**2500/350**	**2500/350**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**	**None**	**None**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**
Recon 2 (Secondary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Bony Pelvis/Hips/SI/Femur/FAI (with Metal) 8.4/8.5/8.6

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Indication

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). Note: there are separate adult and pediatric protocols for bony pelvis and there is a separate adult femoral anteversion and pediatric SPICA protocol.

Oral Contrast

None

Pre-Scan Instructions

- Patient supine, legs flat on the table.
- No cushions/wedges under legs/feet.
- Turn the toes inward.

IV Contrast Parameters 350

Medrad™ P3T Abdomen protocol, Ulrich Routine Body Adult, or UW ConCal for weight based contrast.

Iohexol (Omnipaque) 350 mg/mL injection at a rate of 3 mL/sec

Rate: As appropriate for IV access (up to 3mL/sec)

Delay: 90sec

For sites without the Medrad™ P3T or UW ConCal option, refer to the weight based contrast tables we provide in the protocol booklet.

IV Contrast Parameters 300/370

Medrad™ P3T Abdomen protocol.

Iohexol (Omnipaque) 300 mg/mL injection at a rate of 3 mL/sec

Rate: As appropriate for IV access (up to 3mL/sec)

Delay: 90sec

For sites without the Medrad™ P3T or P3T PA option, refer to the weight based contrast tables we provide in the protocol booklet.

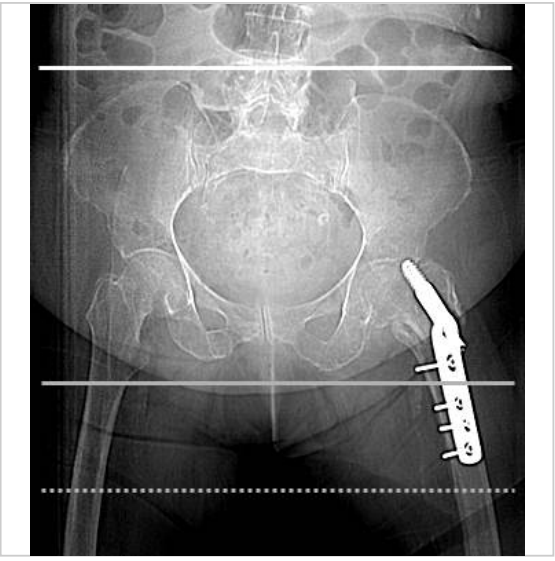
Field of View

36 cm

Scan Description

- Series 1 – PA and lateral scout

- Series 2 – CT Bony Pelvis
  - Coverage: (see picture)
  - From above iliac crests (white line)
  - To below lesser trochanters and below ischial tuberosities (gray line)
  - If hardware is present, cover the hardware and adjacent bone (dotted line)



Bony Pelvis Scan Range

Reformat Instructions

Reformat slices 3mm Thick at 1.5mm Intervals in all 3 planes in the Bone Window unless specified to also do STD.

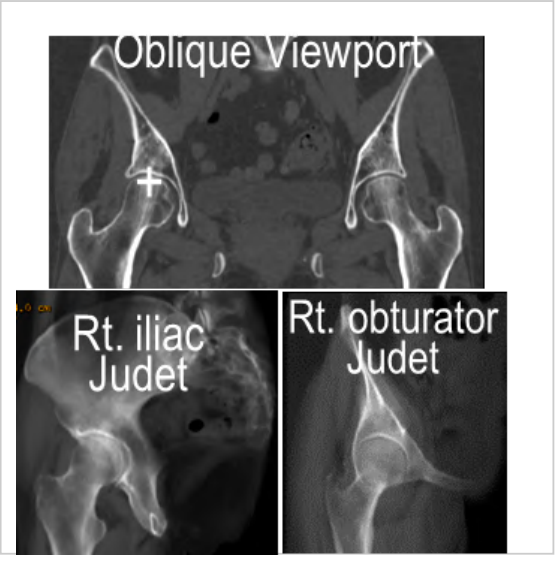
- Straight Axial Reformats
  - Set-up off a coronal image that shows both femoral heads.
  - Angle such that slices cut through femoral heads evenly (dotted line).
  - Cover from iliac crests through ischial tuberosities and lesser trochanters.
- Straight Coronal Reformats
  - Set-up off an axial image that shows pubic symphysis.
  - Angle slices through ischial tuberosities evenly (dotted line).
  - Cover from in front of the pubic symphysis to behind the gluteal muscles.
- Straight Sagittal Reformats
  - Can set-up off same axial image as above.
  - Cover continuously from the right hip to the left hip, including the sacrum.

Reformat slices 3mm Thick at 1.5mm Intervals in all 3 planes
For "FAI" add oblique reformats parallel to femoral necks (blue lines)

Judet Views (For acetabular fractures)

- To reformat “Judet” views on GE CT scanner:

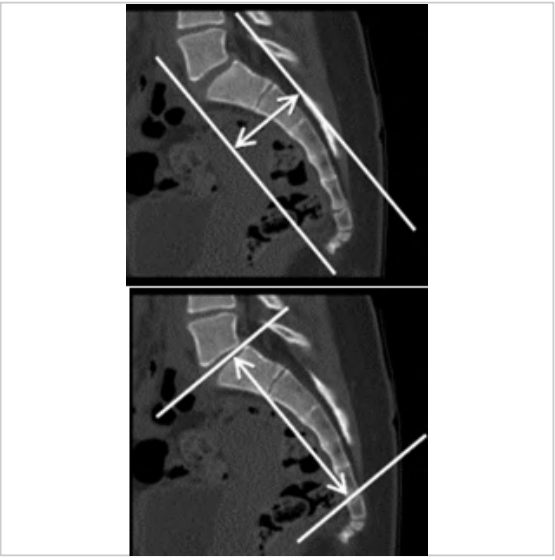
- Move reference to femoral head on oblique viewport
- Adjust slice thickness (middle mouse button) ~60mm
- Change “MIP” to “Average” (right mouse button)
- Set Window=2000, Level=350
- Hide Annotations (right mouse button)
- Click “Rotate/Translate” button. Can sometimes be hidden within “Display button” (blue box with the letter A) and set to 45 degrees
- Click to “Rotate to Left”
- Save Image (right mouse button)
- Click TWICE to rotate to center, then to right
- Save this image as well.
    - Repeat steps 7-10 for other hip. Send the 4 images.



Example of Judet reformating

SI Joints- Reformat 3mm Thick at 1.5mm Intervals

- Oblique Coronal Reformats
    - Set-up off a mid-line sagittal image through the sacrum.
    - Angle slices parallel to the long axis of the sacrum.
    - Cover the sacrum front-to-back. (Check the reformats to make sure the SI joints are covered in their entirety.)
- Oblique Axial Reformats
    - Set-up off same mid-sagittal image as above.
    - Angle slices to be perpendicular to the oblique coronals.
    - Cover the entire sacrum top-to-bottom.



SI joints for reformatting

- **If a HD/GSI Scan**: Recons & Reformats: Do all reformats specific for this protocol on the 140 keV BonePlus recon (QC is recon 1) and send to ALI_Store.

Reformats

For Adults:

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
AX	Thin Bone	Manual	Average	2500/350	3	1.5	axial
CO	Thin Bone	Manual	Average	2500/350	3	1.5	coronal
SA	Thin Bone	Manual	Average	2500/350	3	1.5	sagittal

For Pediatrics:

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
AX	Thin Bone	Manual	Average	2500/350	1.25	0.625	axial
CO	Thin Bone	Manual	Average	2500/350	1.25	0.625	coronal
SA	Thin Bone	Manual	Average	2500/350	1.25	0.625	sagittal
AX ST	Thin Soft Tissue	Manual	Average	450/50	2	1	axial

Networking

- All images are networked to PACS (ALI_Store).
- Note: If smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

Miscellaneous

None.

Acquisition Parameters

Series 1, Scout

	Small	Medium	Large
Scout 1 kV	**100**	**120**	**140**
Scout 1 mA	**10**	**10**	**10**
Scout 1 Angle	**180**	**180**	**180**
Scout 2 kV	**100**	**120**	**140**
Scout 2 mA	**40**	**40**	**80**
Scout 2 Angle	**90**	**90**	**90**
WW/WL for Scout	**500/50**	**500/50**	**500/50**

Series 2, Scan Phase

	Small	Medium	Large
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**40**	**40**	**40**
Detector Rows	**64.0**	**64.0**	**64.0**
Detector Configuration	**64x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Large Body**	**Large Body**	**Large Body**
Pitch	**0.516**	**0.516**	**0.516**
Speed (mm/rot)	**20.60**	**20.60**	**20.60**
Rotation Time (s)	**0.6**	**1**	**1**
kV	**140**	**140**	**140**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(50-440)**	**(50-515)**	**(60-515)**
Manual mA	**270.0**	**250.0**	**380.0**
Noise Index	**11.5**	**15.5**	**23.0**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Series 2, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**30**	**40**	**50**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**2500/350**	**2500/350**	**2500/350**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**	**None**	**None**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**
Recon 2 (Secondary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

If your Scanner has MAR software, turn this additional recon "ON" in the presence of metal. If Metal

MAR	Small	Medium	Large
Recon 3 (Secondary)			
DFOV	**30**	**40**	**50**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
Recon Option	**MARS On**	**MARS On**	**MARS On**
ASiR/ASiR256/DLIR	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Mako Hip 8.14

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Indication

Pre robot surgery scan for MAKO hip procedure.

Oral Contrast

None

Pre-Scan Instructions

- Scan patient in supine position feet first, anytime before MAKOplasty THA procedure (up to 8 weeks in advance).
- Position patient to minimize pelivic obliquity through the following measures:
  - Align both ankles and both knees
  - Ensure patient is in true supine position by
  - Palpating the anteriror superior iliac spines and compairing relative height above the CT scanner bed
  - Align longitudinal axis of the body with Longitudinal axis of CT scanning bed

IV Contrast Parameters

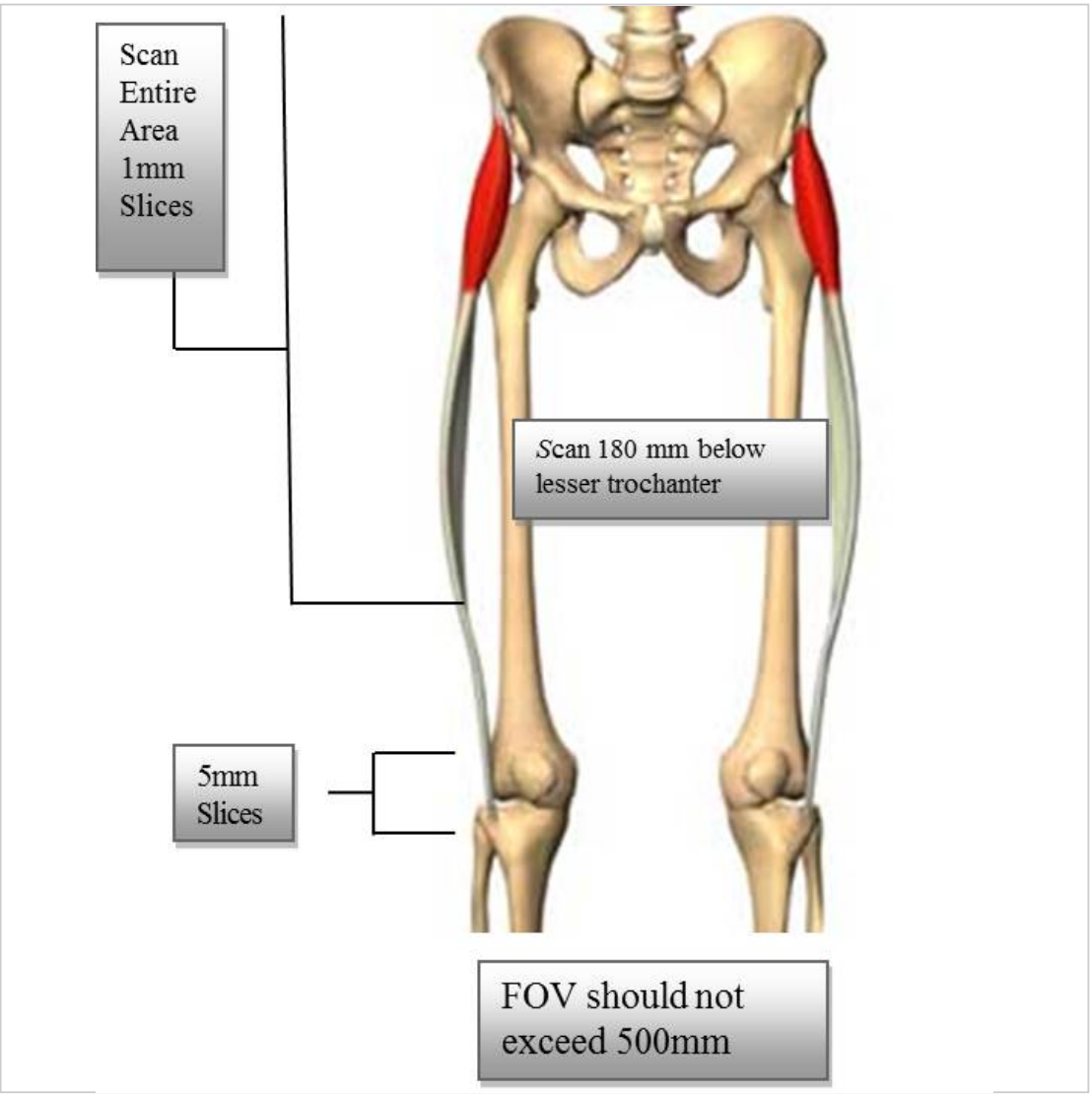
None

Field of View

- Should not exceed 50 cm
- Pelvis and Proximal Femur: Scan includes the entire bi-lateral pelvis(Medial/Lateral/Anterior/Posterior/Superior) and at least 18 cm below the lesser torochanter on the femur
- Knee: Scan includes bilateral knee-joint lines Between femur and tibia and 10cm proximal to joint line on femur

Scan Description

- Series 1 - PA and lateral scouts
- Series 2 - MAKO hip
  - Mako Hip Coverage:
    - Supine Only: Invert patient toes, include lesser trochanters.
    - Pelvis and Proximal Femur: FOV:Scan includes the entire bi-lateral pelvis(Medial/Lateral/Anterior/Posterior/Superior) and at least 180mm below the lesser trochanter on the femur
    - Knee: Scan includes bilateral knee-joint lines between femur and tibia and 10 cm proximal to joint line on femur.



MAKO hip scan ranges

Reformat Instructions

Same as Bony Pelvis without (SA, CO, AX)

- **If a HD/GSI Scan**: Recons & Reformats: Do all reformats specific for this protocol on the 140 keV BonePlus recon (QC is recon 1) and send to ALI_Store.

Reformats

Table not yet provided, please see reformat instructions above.

Networking

- Send Axial Images, Reformats and Scouts to PACS (ALI_Store).
- Note: if smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

Bone Density Recon 3 is sent to QCT-HIP and PACS (ALI_Store).

Miscellaneous

None

Acquisition Parameters

Series 1, Scout

	Any Size
Scout 1 kV	**120**
Scout 1 mA	**10**
Scout 1 Angle	**180**
Scout 2 kV	**120**
Scout 2 mA	**40**
Scout 2 Angle	**90**
WW/WL for Scout	**500/50**

Series 2, Group 1, Scan Phase

	Any Size
Scan Type	**Helical**
Beam Collimation	**40**
Detector Rows	**64.0**
Detector Configuration	**64x0.625**
Scan FOV	**Large Body**
Pitch	**0.516**
Speed (mm/rot)	**20.60**
Rotation Time (s)	**0.6**
kV	**120**
AEC type	**Manual mA**
mA Range	**(380-380)**
Manual mA	**380**
Noise Index	**5.0**
Slice Thickness (mm)	**0.625**
Interval (mm)	**0.625**

Series 2, Group 1, Recons

	Any Size
Recon 1 (Primary)	
DFOV	**50**
Recon Type	**Bone Plus**
WW/WL	**2500/350**
Recon Option	**Full**
Recon Option	
ASiR/ASiR256/DLIR	**None**
Slice Thickness (mm)	**0.625**
Interval (mm)	**0.625**
Recon 2 (Secondary)	
DFOV	**50**
Recon Type	**Standard**
WW/WL	**350/50**
Recon Option	**Plus**
Recon Option	
ASiR/ASiR256/DLIR	**40% / 20% / Low**
Slice Thickness (mm)	**2.5**
Interval (mm)	**2.5**

Series 2, Group 2, Scan Phase

	Any Size
Scan Type	**Helical**
Beam Collimation	**40**
Detector Rows	**64.0**
Detector Configuration	**64x0.625**
Scan FOV	**Large Body**
Pitch	**0.516**
Speed (mm/rot)	**20.60**
Rotation Time (s)	**0.6**
kV	**120**
AEC type	**Manual mA**
mA Range	**(190-190)**
Manual mA	**190**
Noise Index	**5.0**
Slice Thickness (mm)	**5**
Interval (mm)	**5**

Series 2, Group 2, Recons

	Any Size
Recon 1 (Primary)	
DFOV	**50**
Recon Type	**Bone Plus**
WW/WL	**2500/350**
Recon Option	**Full**
Recon Option	
ASiR/ASiR256/DLIR	**None**
Slice Thickness (mm)	**5.0**
Interval (mm)	**5.0**

Ankle/Foot/Distal Tibia (without Metal) 9.1

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Pediatric Patients Under 13 years of age: See Appendix for Technique Instruction, Guidance for pediatric extremity MSK protocols

Indication

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. If TARSAL COALITION is indicated, please scan both ankles/feet together for comparison.

Oral Contrast

None

Pre-Scan Instructions

- Use a foot holder, if available.
- Patient supine.
- Position the patient such that the foot/ankle of interest is centered in the scanner. Scan **only side of interest** and, if possible, flex contralateral knee w/ pillow under it to remove from scan range.
- Except for the indication of Tarsal Coalition, where bilateral is preferred, scan both ankles/feet together for comparison.
- Toes pointing straight up.
- No gantry tilt.
    - PLEASE NOTE: IF there is metal present in the opposite foot of interest, and you are unable to flex that opposite foot out of the scan range, scan both feet together using the **WITHOUT METAL** protocol. (Metal from the opposite foot of interest will not cause enough artifact to require the with metal protocol dose.)

IV Contrast Parameters 350

Medrad™ P3T Abdomen protocol, Ulrich Routine Body Adult, or UW ConCal for weight based contrast.

Iohexol (Omnipaque) 350 mg/mL injection at a rate of 3 mL/sec

Rate: As appropriate for IV access (up to 3mL/sec)

Delay: 90sec

For sites without the Medrad™ P3T or UW ConCal option, refer to the weight based contrast tables we provide in the protocol booklet.

IV Contrast Parameters 300/370

Medrad™ P3T Abdomen protocol.

Iohexol (Omnipaque) 300 mg/mL injection at a rate of 3 mL/sec

Rate: As appropriate for IV access (up to 3mL/sec)

Delay: 90sec

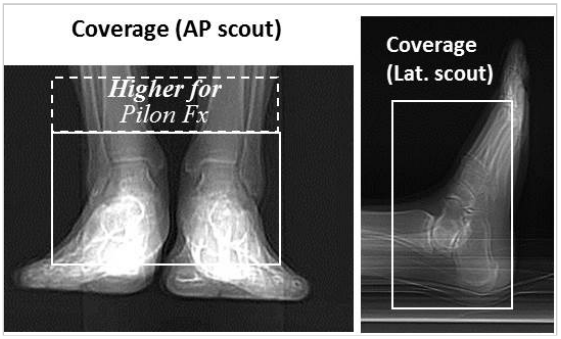
For sites without the Medrad™ P3T or P3T PA option, refer to the weight based contrast tables we provide in the protocol booklet.

Field of View

Preferred 22 cm

Scan Description

- Series 1 - PA and lateral scout
  - Coverage (see images)



Ankle coverage

- Series 2 - CT Ankle/Foot/Distal Tib
  - Coverage for Ankle/Distal Tibia: Start scan above syndesmosis (Tib/fib Joint)(Higher for pilon Fractures as noted in image.) End scan below calcaneus.
  - Coverage for Foot: Start scan above syndesmosis (Tib/fib Joint) include entire foot (tarsals, metatarsals and phalanges).

Reformat Instructions

Use the Bone Window unless specified to use STD.

Ankl/Distal Tibia(centered on Ankle Joint) Appropriate for:

- Distal tibial fractures (Pilon, malleoli, triplane, juvenile Tillaux)
- Talar dome fractures (OCD)

Picture descriptions from left to right:

- Straight Axial- Off the sagittal, 2x1mm
- Mortise Coronal- Off an axial, 2x1mm
- Mortise Sagittal- Off an axial, 2x1mm

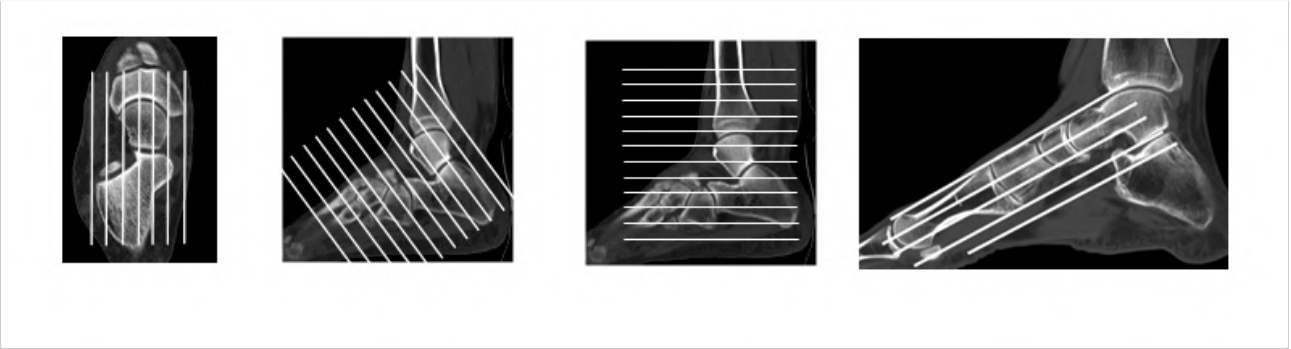
3 Planes of Ankle Reformats

Hindfoot/Midfoot (centered on Chopart's Joint) Appropriate for:

- Hindfoot fractures (calcaneus, talar body, sub-talar joint)
- Tarsal coalitions

Picture descriptions from left to right:

- Straight Sagittal- Off an axial
- Oblique Coronal- Off a sagittal
- Straight Axial- Off a sagittal
- Oblique Axial- Off a sagittal and parallel to MT



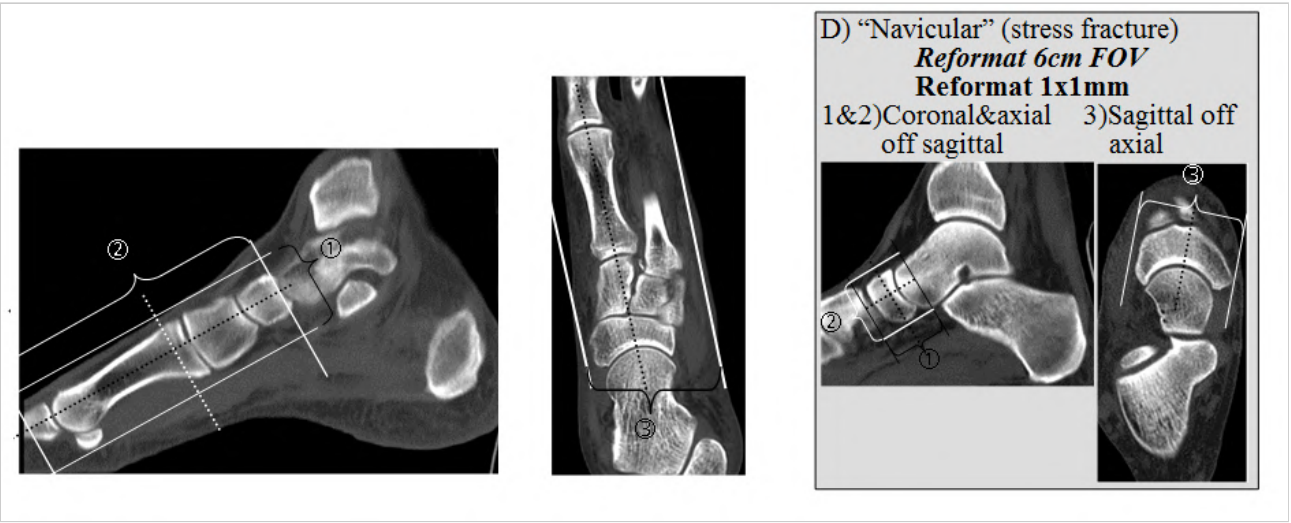
4 Planes of Mid-foot reformats

Forefoot/Midfoot (centered on Lisfranc's Joint) Appropriate for:

- Forefoot fractures (Lisfranc dislocation, metatarsals)

Picture descriptions from left to right: ALL PLANES RELATIVE TO 1ST METATARSAL (May have to oblique reference image to see 1st MT)

1. Short axis- Off a sagittal
2. Axial or long axis- Off a sagittal, 2x1mm
3. Sagittal- Off an axial, 2x1mm



3 Planes of Forefoot reformats

Navicular Appropriate for:

- Navicular Stress Fractures

Picture descriptions from left to right:

1. Coronal Navicular
2. Axial Navicular
3. Sagittal Navicular

- **If a HD/GSI Scan**: Recons & Reformats: Do all reformats specific for this protocol on the 140 keV BonePlus recon (QC is recon 1) and send to ALI_Store.

Reformats

Adult and Pediatric patients:

For Distal Tibia:

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
AX	Thin Bone	Manual	Average	2500/350	2	1	axial
CO	Thin Bone	Manual	Average	2500/350	2	1	coronal
SA	Thin Bone	Manual	Average	2500/350	2	1	sagittal
AX ST	Thin Soft Tissue	Manual	Average	450/50	2	1	axial

For OCD:

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
AX	Thin Bone	Manual	Average	2500/350	2	1	axial
CO	Thin Bone	Manual	Average	2500/350	1	0.5	coronal
SA	Thin Bone	Manual	Average	2500/350	1	0.5	sagittal
AX ST	Thin Soft Tissue	Manual	Average	450/50	2	1	axial

For Hindfoot/Midfoot:

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
SA	Thin Bone	Manual	Average	2500/350	2	1	sagittal
OBL CO	Thin Bone	Manual	Average	2500/350	2	1	coronal
AX	Thin Bone	Manual	Average	2500/350	2	1	axial
OBL AX	Thin Bone	Manual	Average	2500/350	2	1	axial
AX ST	Thin Soft Tissue	Manual	Average	450/50	2	1	axial

For Forefoot/Midfoot:

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
AX Long	Thin Bone	Manual	Average	2500/350	2	1	axial
AX Short	Thin Bone	Manual	Average	2500/350	2	1	axial
SA	Thin Bone	Manual	Average	2500/350	2	1	sagittal
AX ST	Thin Soft Tissue	Manual	Average	450/50	2	1	axial

Networking

- All images are networked to PACS (ALI_Store).
- Note: If smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

Miscellaneous

None

Acquisition Parameters

If you have Hi-Res/HD mode: UW recommends turning Hi-Res mode "ON", but using the regular (i.e., non HD) kernels. HD kernels increase the image noise. See *Rubert, Nicholas, Timothy Szczykutowicz, and Frank Ranallo. "Improvement in CT image resolution due to the use of focal spot deflection and increased sampling." Journal of applied clinical medical physics 17, no. 3 (2016): 452-466.*

Series 1, Scout

Scout 1 kV	**120**
Scout 1 mA	**10**
Scout 1 Angle	**180**
Scout 2 kV	**120**
Scout 2 mA	**40**
Scout 2 Angle	**90**
WW/WL for Scout	**500/50**

Series 2, Scan Phase

Scan Type	**Helical**
Beam Collimation	**40**
Detector Rows	**64.0**
Detector Configuration	**64x0.625**
Scan FOV	**Large Body**
Pitch	**0.516**
Speed (mm/rot)	**20.60**
Rotation Time (s)	**0.9**
kV	**100**
AEC type	**Manual mA**
mA Range	**(40-320)**
Manual mA	**200.0**
Noise Index	**13.0**
Slice Thickness (mm)	**0.625**
Interval (mm)	**0.312**

Series 2, Recons

	No Metal
Recon 1 (Primary)	
DFOV	**22**
Recon Type	**Bone Plus**
WW/WL	**2500/350**
Recon Option	**Plus**
Recon Option	**IQ Enhance**
ASiR/ASiR256/DLIR	
Slice Thickness (mm)	**0.625**
Interval (mm)	**0.312**
Recon 2 (Secondary)	
DFOV	**22**
Recon Type	**Standard**
WW/WL	**450/50**
Recon Option	**Plus**
Recon Option	**IQ Enhance**
ASiR/ASiR256/DLIR	**40% / 20% / Medium**
Slice Thickness (mm)	**0.625**
Interval (mm)	**0.312**

Ankle/Foot/Distal Tibia (with Metal) 9.2

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Pediatric Patients Under 13 years of age: See Appendix for Technique Instruction, Guidance for pediatric extremity MSK protocols

Indication

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. If TARSAL COALITION is indicated, please scan both ankles/feet together for comparison.

Oral Contrast

None

Pre-Scan Instructions

- Use a foot holder, if available.
- Patient supine.
- Position the patient such that the foot/ankle of interest is centered in the scanner. Scan **only side of interest** and, if possible, flex contralateral knee w/ pillow under it to remove from scan range.
- Except for the indication of Tarsal Coalition, where bilateral is preferred, scan both ankles/feet together for comparison.
- Toes pointing straight up.
- No gantry tilt.
    - PLEASE NOTE: IF there is metal present in the opposite foot of interest, and you are unable to flex that opposite foot out of the scan range, scan both feet together using the **WITHOUT METAL** protocol. (Metal from the opposite foot of interest will not cause enough artifact to require the with metal protocol dose.)

IV Contrast Parameters 350

Medrad™ P3T Abdomen protocol, Ulrich Routine Body Adult, or UW ConCal for weight based contrast.

Iohexol (Omnipaque) 350 mg/mL injection at a rate of 3 mL/sec

Rate: As appropriate for IV access (up to 3mL/sec)

Delay: 90sec

For sites without the Medrad™ P3T or UW ConCal option, refer to the weight based contrast tables we provide in the protocol booklet.

IV Contrast Parameters 300/370

Medrad™ P3T Abdomen protocol.

Iohexol (Omnipaque) 300 mg/mL injection at a rate of 3 mL/sec

Rate: As appropriate for IV access (up to 3mL/sec)

Delay: 90sec

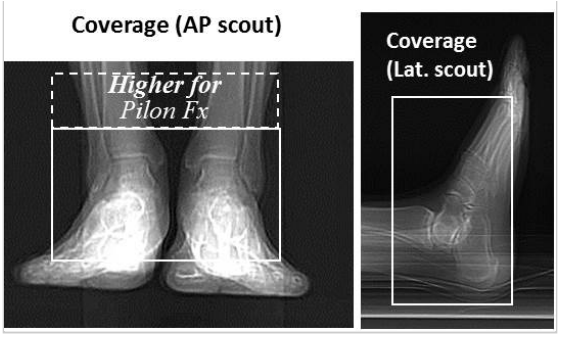
For sites without the Medrad™ P3T or P3T PA option, refer to the weight based contrast tables we provide in the protocol booklet.

Field of View

Preferred 22 cm

Scan Description

- Series 1 - PA and lateral scout
  - Coverage (see images)



Ankle coverage

- Series 2 - CT Ankle/Foot/Distal Tib
  - Coverage for Ankle/Distal Tibia: Start scan above syndesmosis (Tib/fib Joint)(Higher for pilon Fractures as noted in image.) End scan below calcaneus.
  - Coverage for Foot: Start scan above syndesmosis (Tib/fib Joint) include entire foot (tarsals, metatarsals and phalanges).

Reformat Instructions

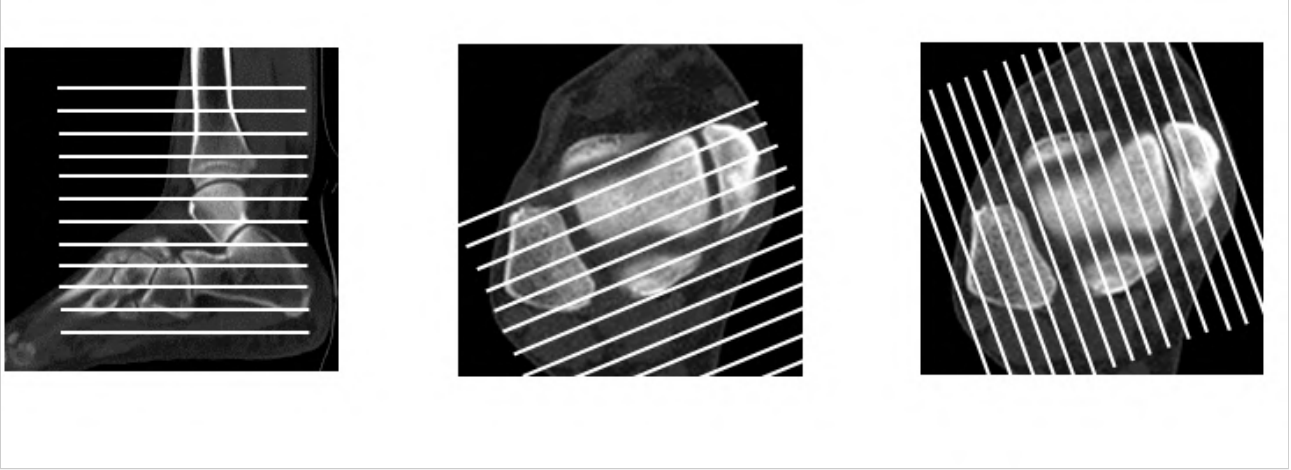
Use the Bone Window unless specified to use STD.

Ankl/Distal Tibia(centered on Ankle Joint) Appropriate for:

- Distal tibial fractures (Pilon, malleoli, triplane, juvenile Tillaux)
- Talar dome fractures (OCD)

Picture descriptions from left to right:

- Straight Axial- Off the sagittal, 2x1mm
- Mortise Coronal- Off an axial, 2x1mm
- Mortise Sagittal- Off an axial, 2x1mm



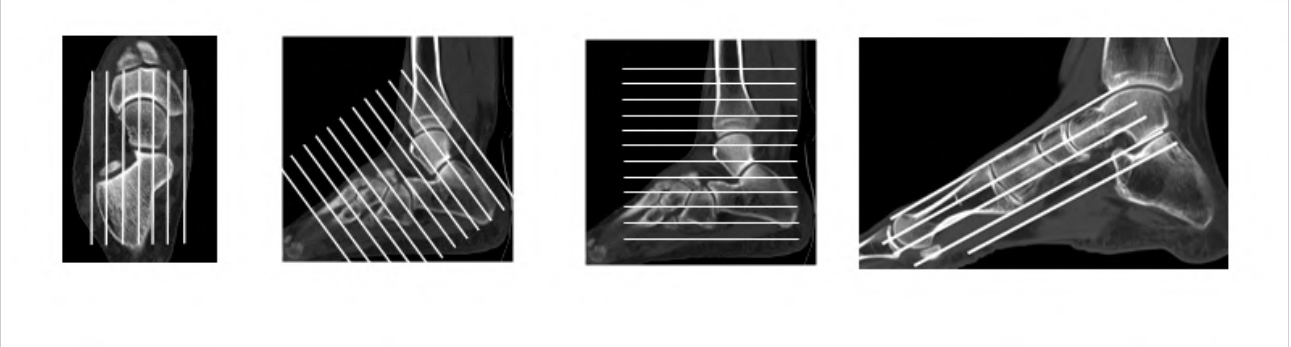
3 Planes of Ankle Reformats

Hindfoot/Midfoot (centered on Chopart's Joint) Appropriate for:

- Hindfoot fractures (calcaneus, talar body, sub-talar joint)
- Tarsal coalitions

Picture descriptions from left to right:

- Straight Sagittal- Off an axial
- Oblique Coronal- Off a sagittal
- Straight Axial- Off a sagittal
- Oblique Axial- Off a sagittal and parallel to MT



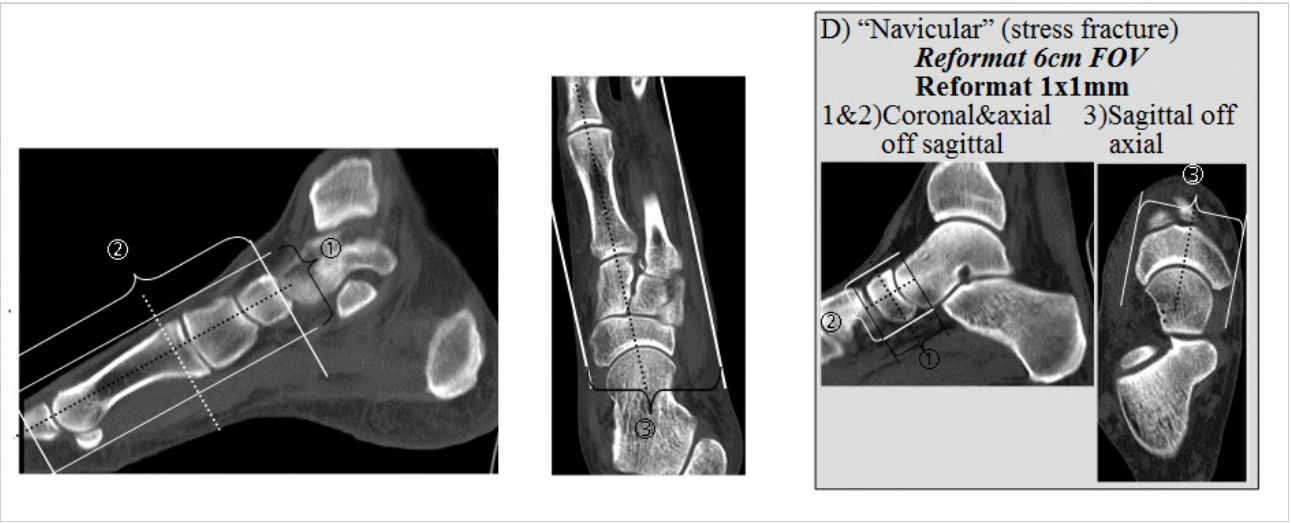
4 Planes of Mid-foot reformats

Forefoot/Midfoot (centered on Lisfranc's Joint) Appropriate for:

- Forefoot fractures (Lisfranc dislocation, metatarsals)

Picture descriptions from left to right: ALL PLANES RELATIVE TO 1ST METATARSAL (May have to oblique reference image to see 1st MT)

1. Short axis- Off a sagittal
2. Axial or long axis- Off a sagittal, 2x1mm
3. Sagittal- Off an axial, 2x1mm



3 Planes of Forefoot reformats

Navicular Appropriate for:

- Navicular Stress Fractures

Picture descriptions from left to right:

1. Coronal Navicular
2. Axial Navicular
3. Sagittal Navicular

- **If a HD/GSI Scan**: Recons & Reformats: Do all reformats specific for this protocol on the 140 keV BonePlus recon (QC is recon 1) and send to ALI_Store.

Reformats

Adult and Pediatric patients:

For Distal Tibia:

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
AX	Thin Bone	Manual	Average	2500/350	2	1	axial
CO	Thin Bone	Manual	Average	2500/350	2	1	coronal
SA	Thin Bone	Manual	Average	2500/350	2	1	sagittal
AX ST	Thin Soft Tissue	Manual	Average	450/50	2	1	axial

For OCD:

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
AX	Thin Bone	Manual	Average	2500/350	2	1	axial
CO	Thin Bone	Manual	Average	2500/350	1	0.5	coronal
SA	Thin Bone	Manual	Average	2500/350	1	0.5	sagittal
AX ST	Thin Soft Tissue	Manual	Average	450/50	2	1	axial

For Hindfoot/Midfoot:

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
SA	Thin Bone	Manual	Average	2500/350	2	1	sagittal
OBL CO	Thin Bone	Manual	Average	2500/350	2	1	coronal
AX	Thin Bone	Manual	Average	2500/350	2	1	axial
OBL AX	Thin Bone	Manual	Average	2500/350	2	1	axial
AX ST	Thin Soft Tissue	Manual	Average	450/50	2	1	axial

For Forefoot/Midfoot:

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
AX Long	Thin Bone	Manual	Average	2500/350	2	1	axial
AX Short	Thin Bone	Manual	Average	2500/350	2	1	axial
SA	Thin Bone	Manual	Average	2500/350	2	1	sagittal
AX ST	Thin Soft Tissue	Manual	Average	450/50	2	1	axial

For Navicular:

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
CO NAV	Thin Bone	Manual	Average	2500/350	1	1	Coronal
AX NAV	Thin Bone	Manual	Average	2500/350	1	1	Axial
SA NAV	Thin Bone	Manual	Average	2500/350	1	1	Sagittal

Networking

- All images are networked to PACS (ALI_Store).
- Note: If smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

Miscellaneous

None

Acquisition Parameters

If you have Hi-Res/HD mode: UW recommends turning Hi-Res mode "ON", but using the regular (i.e., non HD) kernels. HD kernels increase the image noise. See *Rubert, Nicholas, Timothy Szczykutowicz, and Frank Ranallo. "Improvement in CT image resolution due to the use of focal spot deflection and increased sampling." Journal of applied clinical medical physics 17, no. 3 (2016): 452-466.*

Series 1, Scout

Scout 1 kV	140
Scout 1 mA	10
Scout 1 Angle	180
Scout 2 kV	140
Scout 2 mA	40
Scout 2 Angle	90
WW/WL for Scout	500/50

Series 2, Scan Phase

Scan Type	Helical
Beam Collimation	40
Detector Rows	64.0
Detector Configuration	64x0.625
Scan FOV	Large Body
Pitch	0.516
Speed (mm/rot)	20.60
Rotation Time (s)	1
kV	140
AEC type	Manual mA
mA Range	(80-515)
Manual mA	380.0
Noise Index	9.0
Slice Thickness (mm)	0.625
Interval (mm)	0.312

Series 2, Recons

	With Metal
Recon 1 (Primary)	
DFOV	**22**
Recon Type	**Bone Plus**
WW/WL	**2500/350**
Recon Option	**Plus**
Recon Option	**IQ Enhance**
ASiR/ASiR256/DLIR	
Slice Thickness (mm)	**0.625**
Interval (mm)	**0.312**
Recon 2 (Secondary)	
DFOV	**22**
Recon Type	**Standard**
WW/WL	**450/50**
Recon Option	**Plus**
Recon Option	**IQ Enhance**
ASiR/ASiR256/DLIR	**40% / 20% / Medium**
Slice Thickness (mm)	**0.625**
Interval (mm)	**0.312**

If your Scanner has MAR software, turn this additional recon "ON" in the presence of metal.

MAR	If Metal
Recon 3 (Secondary)	
DFOV	**22**
Recon Type	**Standard**
WW/WL	**450/50**
Recon Option	**Plus**
Recon Option	**IQ Enhance**
Recon Option	**MARS On**
ASiR/ASiR256/DLIR	**40% / 20% / Medium**
Slice Thickness (mm)	**0.625**
Interval (mm)	**0.312**

Knee/Tibia (without Metal) 9.3

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Pediatric Patients Under 13 years of age: See Appendix for Technique Instruction, Guidance for pediatric extremity MSK protocols

Indication

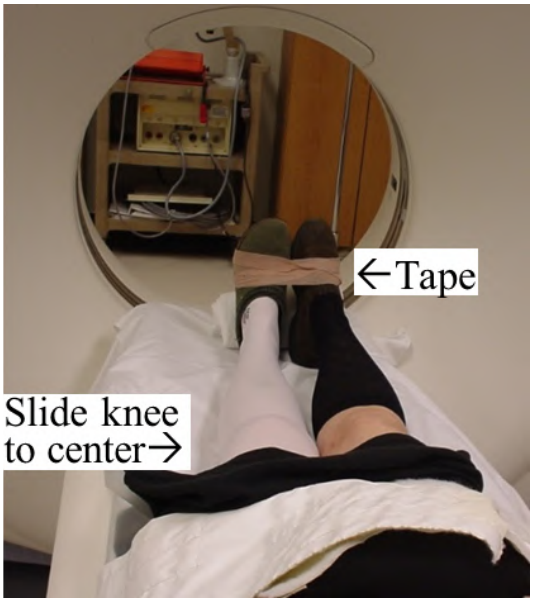
Assess the alignment and degree of displacement of fracture fragments, particularly at the articular surfaces. Also for the evaluation of arthritis, mineralized lesions, and to evaluate the bone surrounding metallic implants.

Oral Contrast

None

Pre-Scan Instructions

- Patient supine.
- Slide patient over so that knee being imaged is centered in scanner. Scan only the side of interest.
- Tape the toes together to help stabilize knees.
  - In most cases it is fine to leave the other knee straight and within the scanning field.
  - If the other knee contains hardware/metal, try to bend it so it is NOT in the scanning field.
- Plaster casts are not problematic.



IV Contrast Parameters 350

Medrad™ P3T Abdomen protocol, Ulrich Routine Body Adult, or UW ConCal for weight based contrast.

Iohexol (Omnipaque) 350 mg/mL injection at a rate of 3 mL/sec

Rate: As appropriate for IV access (up to 3mL/sec)

Delay: 90sec

For sites without the Medrad™ P3T or UW ConCal option, refer to the weight based contrast tables we provide in the protocol booklet.

IV Contrast Parameters 300/370

Medrad™ P3T Abdomen protocol.

Iohexol (Omnipaque) 300 mg/mL injection at a rate of 3 mL/sec

Rate: As appropriate for IV access (up to 3mL/sec)

Delay: 90sec

For sites without the Medrad™ P3T or P3T PA option, refer to the weight based contrast tables we provide in the protocol booklet.

Field of View

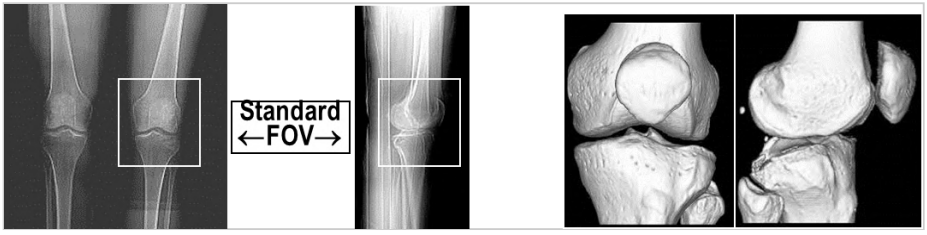
25 cm

The FOV must include:

- The entire patella
- Both femoral condyles in their entirety
- The proximal tibia through the level of the fibular head
- If scanning a metal knee prosthesis, it is necessary to cover the entire length of both the femoral and tibial components.

Scan Description

- Series 1 – PA and lateral scout
- Series 2 – CT Knee
    - Coverage (see images)

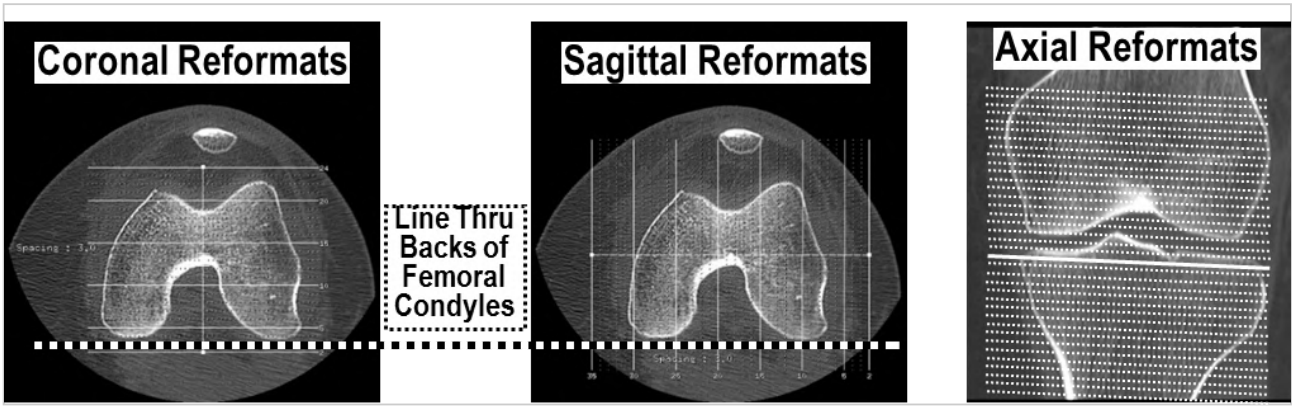


Knee FOV

Reformat Instructions

Reformatting Planes in the Bone Window unless specified to also do STD.

- All Knee CTs are reformatted in 3 orthogonal planes using the BonePlus source images.
    - Reformatted images should be stored using a “Bone” window (2000/350).
    - Unless specifically requested, it is not necessary to make “Standard” algorithm reformats.
- In most cases, make the reformats 2mm thick at 1mm intervals (no gap) in all 3 planes.
    - If the request is for “OCD” (Osteochondral Defect, Osteochondritis Desiccans) make the Coronal and sagittal reformats 1mm thick at 1mm intervals (no gap).
- Coronal & sagittal reformats are made off an axial reference image.
    - Parallel & perpendicular to a line through the back of the femoral condyles.



Three Knee Reformats

- Axial reformats are made off a mid-coronal reference image.
  - Parallel to the top if the tibial plateau.
  - Annotate as to “Right” or “Left”.
- **If a HD/GSI Scan**: Recons & Reformats: Do all reformats specific for this protocol on Recon 2 (140D) and Recon 3 (110D) and send to ALI_Store. When naming the reformat please use 140D and 110D in the name so they can decifer the two.

If a long bone scan (tibia/fibula) is ordered, do CO/SA/AX reformat in 2x1 mm using the thin bone series.

- **If a HD/GSI Scan**: Recons & Reformats: Do all reformats specific for this protocol on the 140 keV BonePlus recon (QC is recon 1) and send to ALI_Store.

Reformats

For Adult and Pediatric patients:

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
AX	Thin Bone	Manual	Average	2500/350	2	1	axial
CO	Thin Bone	Manual	Average	2500/350	2	1	coronal
SA	Thin Bone	Manual	Average	2500/350	2	1	sagittal
AX ST	Thin Soft Tissue	Manual	Average	450/50	2	1	axial

For OCD:

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
AX	Thin Bone	Manual	Average	2500/350	2	1	axial
CO	Thin Bone	Manual	Average	2500/350	1	0.5	coronal
SA	Thin Bone	Manual	Average	2500/350	1	0.5	sagittal
AX ST	Thin Soft Tissue	Manual	Average	450/50	2	1	axial

Networking

- All images are networked to PACS (ALI_Store).
- Note: If smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

Miscellaneous

None

Acquisition Parameters

If you have Hi-Res/HD mode: UW recommends turning Hi-Res mode "ON", but using the regular (i.e., non HD) kernels. HD kernels increase the image noise. See *Rubert, Nicholas, Timothy Szczykutowicz, and Frank Ranallo. "Improvement in CT image resolution due to the use of focal spot deflection and increased sampling." Journal of applied clinical medical physics 17, no. 3 (2016): 452-466.*

Series 1, Scout

Scout 1 kV	**120**
Scout 1 mA	**10**
Scout 1 Angle	**180**
Scout 2 kV	**120**
Scout 2 mA	**40**
Scout 2 Angle	**90**
WW/WL for Scout	**500/50**

Series 2, Scan Phase

Scan Type	**Helical**
Beam Collimation	**40**
Detector Rows	**64.0**
Detector Configuration	**64x0.625**
Scan FOV	**Large Body**
Pitch	**0.516**
Speed (mm/rot)	**20.60**
Rotation Time (s)	**0.9**
kV	**100**
AEC type	**Manual mA**
mA Range	**(40-320)**
Manual mA	**200.0**
Noise Index	**13.0**
Slice Thickness (mm)	**0.625**
Interval (mm)	**0.312**

Series 2, Recons

	No Metal
Recon 1 (Primary)	
DFOV	**25**
Recon Type	**Bone Plus**
WW/WL	**2500/350**
Recon Option	**Plus**
Recon Option	**IQ Enhance**
ASiR/ASiR256/DLIR	
Slice Thickness (mm)	**0.625**
Interval (mm)	**0.312**
Recon 2 (Secondary)	
DFOV	**25**
Recon Type	**Standard**
WW/WL	**450/50**
Recon Option	**Plus**
Recon Option	**IQ Enhance**
ASiR/ASiR256/DLIR	**40% / 20% / Medium**
Slice Thickness (mm)	**0.625**
Interval (mm)	**0.312**

Knee/Tibia (with Metal) 9.4

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Pediatric Patients Under 13 years of age: See Appendix for Technique Instruction, Guidance for pediatric extremity MSK protocols

Indication

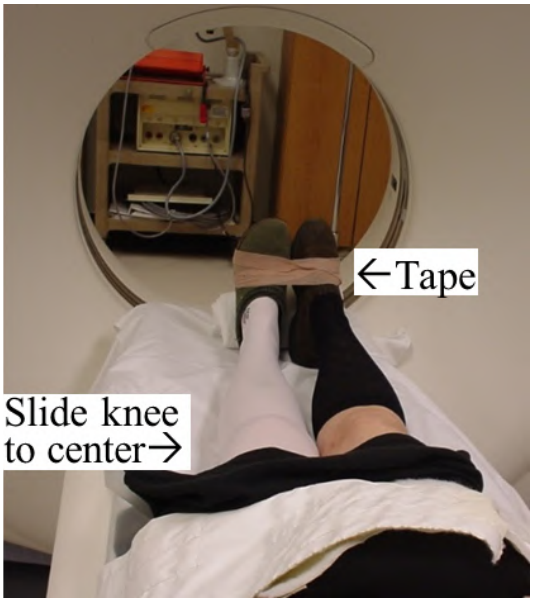
Assess the alignment and degree of displacement of fracture fragments, particularly at the articular surfaces. Also for the evaluation of arthritis, mineralized lesions, and to evaluate the bone surrounding metallic implants.

Oral Contrast

None

Pre-Scan Instructions

- Patient supine.
- Slide patient over so that knee being imaged is centered in scanner. Scan only the side of interest.
- Tape the toes together to help stabilize knees.
  - In most cases it is fine to leave the other knee straight and within the scanning field.
  - If the other knee contains hardware/metal, try to bend it so it is NOT in the scanning field.
- Plaster casts are not problematic.



IV Contrast Parameters 350

Medrad™ P3T Abdomen protocol, Ulrich Routine Body Adult, or UW ConCal for weight based contrast.

Iohexol (Omnipaque) 350 mg/mL injection at a rate of 3 mL/sec

Rate: As appropriate for IV access (up to 3mL/sec)

Delay: 90sec

For sites without the Medrad™ P3T or UW ConCal option, refer to the weight based contrast tables we provide in the protocol booklet.

IV Contrast Parameters 300/370

Medrad™ P3T Abdomen protocol.

Iohexol (Omnipaque) 300 mg/mL injection at a rate of 3 mL/sec

Rate: As appropriate for IV access (up to 3mL/sec)

Delay: 90sec

For sites without the Medrad™ P3T or P3T PA option, refer to the weight based contrast tables we provide in the protocol booklet.

Field of View

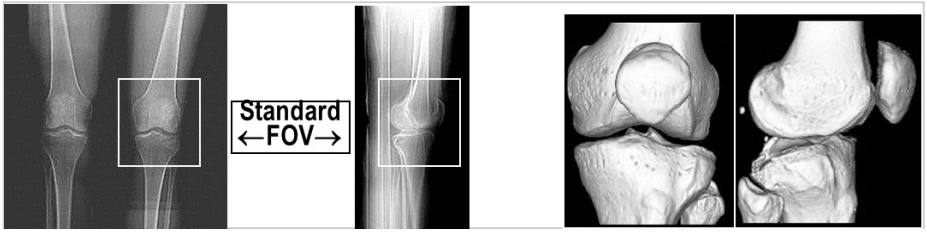
25 cm

The FOV must include:

- The entire patella
- Both femoral condyles in their entirety
- The proximal tibia through the level of the fibular head
- If scanning a metal knee prosthesis, it is necessary to cover the entire length of both the femoral and tibial components.

Scan Description

- Series 1 – PA and lateral scout
- Series 2 – CT Knee
    - Coverage (see images)

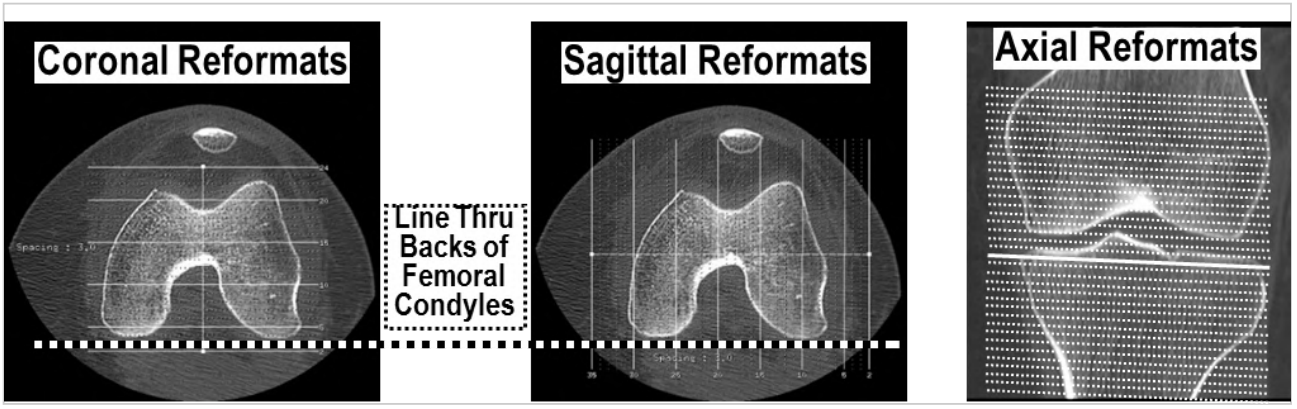


Knee FOV

Reformat Instructions

Reformatting Planes in the Bone Window unless specified to also do STD.

- All Knee CTs are reformatted in 3 orthogonal planes using the BonePlus source images.
    - Reformatted images should be stored using a “Bone” window (2000/350).
    - Unless specifically requested, it is not necessary to make “Standard” algorithm reformats.
- In most cases, make the reformats 2mm thick at 1mm intervals (no gap) in all 3 planes.
    - If the request is for “OCD” (Osteochondral Defect, Osteochondritis Desiccans) make the Coronal and sagittal reformats 1mm thick at 1mm intervals (no gap).
- Coronal & sagittal reformats are made off an axial reference image.
    - Parallel & perpendicular to a line through the back of the femoral condyles.



Three Knee Reformats

- Axial reformats are made off a mid-coronal reference image.
  - Parallel to the top if the tibial plateau.
  - Annotate as to “Right” or “Left”.
- **If a HD/GSI Scan**: Recons & Reformats: Do all reformats specific for this protocol on Recon 2 (140D) and Recon 3 (110D) and send to ALI_Store. When naming the reformat please use 140D and 110D in the name so they can decifer the two.

If a long bone scan (tibia/fibula) is ordered, do CO/SA/AX reformat in 2x1 mm using the thin bone series.

- **If a HD/GSI Scan**: Recons & Reformats: Do all reformats specific for this protocol on the 140 keV BonePlus recon (QC is recon 1) and send to ALI_Store.

Reformats

For Adult and Pediatric patients::

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
AX	Thin Bone	Manual	Average	2500/350	2	1	axial
CO	Thin Bone	Manual	Average	2500/350	2	1	coronal
SA	Thin Bone	Manual	Average	2500/350	2	1	sagittal
AX ST	Thin Soft Tissue	Manual	Average	450/50	2	1	axial

For OCD:

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
AX	Thin Bone	Manual	Average	2500/350	2	1	axial
CO	Thin Bone	Manual	Average	2500/350	1	0.5	coronal
SA	Thin Bone	Manual	Average	2500/350	1	0.5	sagittal
AX ST	Thin Soft Tissue	Manual	Average	450/50	2	1	axial

Networking

- All images are networked to PACS (ALI_Store).
- Note: If smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

Miscellaneous

None

Acquisition Parameters

If you have Hi-Res/HD mode: UW recommends turning Hi-Res mode "ON", but using the regular (i.e., non HD) kernels. HD kernels increase the image noise. See *Rubert, Nicholas, Timothy Szczykutowicz, and Frank Ranallo. "Improvement in CT image resolution due to the use of focal spot deflection and increased sampling." Journal of applied clinical medical physics 17, no. 3 (2016): 452-466.*

Series 1, Scout

Scout 1 kV	**140**
Scout 1 mA	**10**
Scout 1 Angle	**180**
Scout 2 kV	**140**
Scout 2 mA	**40**
Scout 2 Angle	**90**
WW/WL for Scout	**500/50**

Series 2, Scan Phase

Scan Type	**Helical**
Beam Collimation	**40**
Detector Rows	**64.0**
Detector Configuration	**64x0.625**
Scan FOV	**Large Body**
Pitch	**0.516**
Speed (mm/rot)	**20.60**
Rotation Time (s)	**1**
kV	**140**
AEC type	**Manual mA**
mA Range	**(80-515)**
Manual mA	**380.0**
Noise Index	**9.0**
Slice Thickness (mm)	**0.625**
Interval (mm)	**0.312**

Series 2, Recons

Recon 1 (Primary)	
DFOV	**25**
Recon Type	**Bone Plus**
WW/WL	**2500/350**
Recon Option	**Plus**
Recon Option	**IQ Enhance**
ASiR/ASiR256/DLIR	
Slice Thickness (mm)	**0.625**
Interval (mm)	**0.312**
Recon 2 (Secondary)	
DFOV	**25**
Recon Type	**Standard**
WW/WL	**450/50**
Recon Option	**Plus**
Recon Option	**IQ Enhance**
ASiR/ASiR256/DLIR	**40% / 20% / Medium**
Slice Thickness (mm)	**0.625**
Interval (mm)	**0.312**

If your Scanner has MAR software, turn this additional recon "ON" in the presence of metal.

	MAR Recon
Recon 3 (Secondary)	
DFOV	**25**
Recon Type	**Standard**
WW/WL	**450/50**
Recon Option	**Plus**
Recon Option	**IQ Enhance**
Recon Option	**MARS On**
ASiR/ASiR256/DLIR	**40% / 20% / Medium**
Slice Thickness (mm)	**0.625**
Interval (mm)	**0.312**

Mako Knee 9.7

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Indication

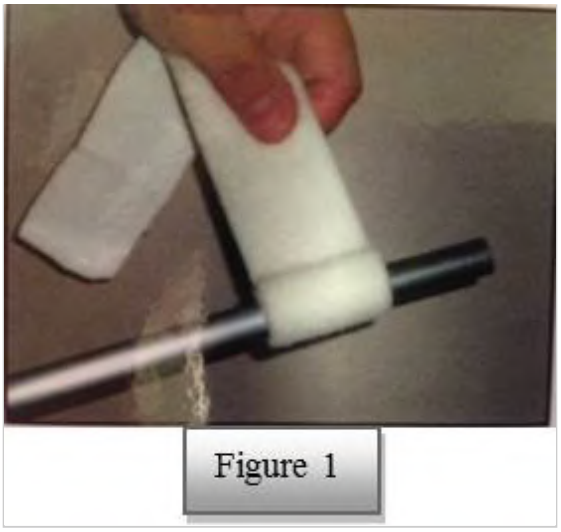
Pre robot surgery scan for MAKO knee procedure.

Oral Contrast

None

Pre-Scan Instructions

- Position patient supine, feet first with foot secured in an upright postion with a rolled towel or blanket wrapped around the bottom of the foot to secure the ankle as shown.
- Elevate the knee of the patient slightly with a rolled towel or blanket.
- Wrap the velcro strap one complete revolution around the rod as shown in the image. Do this for both Velcro straps, one at the hip position and one at the ankle position as shown.
- Set the Motion Rod on the patient to pass From just proximal of Hip Center to distal of Ankle Center as shown in the image.
- Adjust the femoral and tibial straps to secure the rod.
- Verifty the rod is in both anterior/posterior and medial/lateral field of views for all scan regions.
- The Velcro strap must be wrapped around the rod in one complete revolution, before wrapping around the leg. Straps should be snug, but not excessively tight.



velcro being wrapped around rod

rod placement

IV Contrast Parameters

None

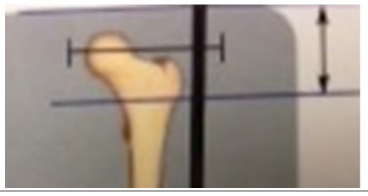
Field of View

- Hip Region: Do not exceed 50 cm
- Knee Region: Do not exceed 25 cm

- Ankle Region: Do not exceed 50 cm

Scan Description

- Series 1 - PA and lateral scouts
- Series 2 - MAKO Knee (During the scan, the pelvis, leg, and Motion Rod Must remain motionless!!)
  - Mako Knee Coverage:
    - Hip: Include entire femoral head and motion rod, center around femoral head
    - Knee: Include distal boundry of tibial tuberosity, entire patellofemoral region and motion rod, center around joint line FOV Do not exceed 250 mm
    - Ankle: Include medial and lateral malleoli and motion rod, center around ankle joint FOV Do not exceed 500mm

Image	Instructions
	**HIP region:** ▪ 2-5mm interval spacing ▪ Include entire femoral head and motion rod, center around femoral head ▪ FOV should not exceed 500mm
	KNEE region: ▪ .5-1mm interval spacing no gap/no overlap ▪ Include distal boundry of tbial tuberosity, entire patellofemoral region and motion rod, center around joint line ▪ FOV should not exceed 250mm
	ANKLE region: ▪ 2-5mm interval spacing ▪ Include medial and lateral malleoli and motion rod, center around ankle joint ▪ FOV should not exceed 500mm

Reformat Instructions

2D's of Knee only

- **If a HD/GSI Scan**: Recons & Reformats: Do all reformats specific for this protocol on the 140 keV BonePlus recon (QC is recon 1) and send to ALI_Store.

Reformats

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
AX	Thin Bone	Manual	Average	2500/350	2	1	axial
CO	Thin Bone	Manual	Average	2500/350	2	1	coronal
SA	Thin Bone	Manual	Average	2500/350	2	1	sagittal

Networking

- Send Axial Images, Reformats and Scouts to PACS (ALI_Store).
- Note: if smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

Miscellaneous

None

Acquisition Parameters

Series 1, Scout

	Any Size
Scout 1 kV	**120**
Scout 1 mA	**10**
Scout 1 Angle	**180**
Scout 2 kV	**120**
Scout 2 mA	**40**
Scout 2 Angle	**90**
WW/WL for Scout	**500/50**

Series 2, Group 1, Scan Phase

	Any Size
Scan Type	**Helical**
Beam Collimation	**40**
Detector Rows	**64.0**
Detector Configuration	**64x0.625**
Scan FOV	**Large Body**
Pitch	**0.516**
Speed (mm/rot)	**20.60**
Rotation Time (s)	**0.6**
kV	**120**
AEC type	**Manual mA**
mA Range	**(380-380)**
Manual mA	**380**
Noise Index	**5.0**
Slice Thickness (mm)	**5**
Interval (mm)	**5**

Series 2, Group 1, Recons

	Any Size
Recon 1 (Primary)	
DFOV	**50**
Recon Type	**Bone Plus**
WW/WL	**2500/350**
Recon Option	**Full**
Recon Option	
ASiR/ASiR256/DLIR	**None**
Slice Thickness (mm)	**5.0**
Interval (mm)	**5.0**

Series 2, Group 2, Scan Phase

	Any Size
Scan Type	**Helical**
Beam Collimation	**40**
Detector Rows	**64.0**
Detector Configuration	**64x0.625**
Scan FOV	**Large Body**
Pitch	**0.516**
Speed (mm/rot)	**20.60**
Rotation Time (s)	**0.6**
kV	**120**
AEC type	**Manual mA**
mA Range	**(190-190)**
Manual mA	**190**
Noise Index	**5.0**
Slice Thickness (mm)	**0.625**
Interval (mm)	**0.625**

Series 2, Group 2, Recons

	Any Size
Recon 1 (Primary)	
DFOV	**25**
Recon Type	**Bone Plus**
WW/WL	**2500/350**
Recon Option	**Full**
Recon Option	
ASiR/ASiR256/DLIR	**None**
Slice Thickness (mm)	**0.625**
Interval (mm)	**0.625**

Series 2, Group 3, Scan Phase

	Any Size
Scan Type	**Helical**
Beam Collimation	**40**
Detector Rows	**64.0**
Detector Configuration	**64x0.625**
Scan FOV	**Large Body**
Pitch	**0.516**
Speed (mm/rot)	**20.60**
Rotation Time (s)	**0.6**
kV	**120**
AEC type	**Manual mA**
mA Range	**(190-190)**
Manual mA	**190**
Noise Index	**5.0**
Slice Thickness (mm)	**5**
Interval (mm)	**5**

Series 2, Group 3, Recons

	Any Size
Recon 1 (Primary)	
DFOV	**50**
Recon Type	**Bone Plus**
WW/WL	**2500/350**
Recon Option	**Full**
Recon Option	
ASiR/ASiR256/DLIR	**None**
Slice Thickness (mm)	**5.0**
Interval (mm)	**5.0**

Femoral Anteversion/Lower Extremity Rotational Study 9.8/9.9/9.10

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Pediatric Patients Under 13 years of age: See Appendix for Technique Instruction, Guidance for pediatric extremity MSK protocols

Indication

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.

Oral Contrast

None

Pre-Scan Instructions

- Patient supine, feet first, legs flat on the table.
  - No cushions/wedges under legs/feet
- Legs as close together as possible.
  - Consider taping feet together (or using foot-board).
  - Consider taping knees if extra stability is needed.

IV Contrast Parameters

None

Field of View

36 cm

Scan Description

- Series 1 – PA and lateral scout
- Series 2 – Helical Scan - 3 small groups covering bilateral hips, knees, and ankles.
  - Scan ankles ONLY if Tibias are clinically requested
    - 1st group: Scan just above femoral heads through lesser trochanters
    - 2nd group: Scan from the distal femoral metaphysis through tops of tibias
    - 3rd group: Scan just above syndesmosis, through talar domes

Femoral Anteversion

Reformat Instructions

- **If a HD/GSI Scan**: Recons & Reformats: Do all reformats specific for this protocol on the 140 keV BonePlus recon (QC is recon 1) and send to ALI_Store.

Reformats

None.

Networking

- All images are networked to PACS (ALI_Store).
- Note: If smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

Miscellaneous

None

Acquisition Parameters

Series 1, Scout

	Small	Medium	Large
Scout 1 kV	**100**	**120**	**140**
Scout 1 mA	**10**	**10**	**10**
Scout 1 Angle	**180**	**180**	**180**
Scout 2 kV	**100**	**120**	**140**
Scout 2 mA	**40**	**40**	**80**
Scout 2 Angle	**90**	**90**	**90**
WW/WL for Scout	**500/50**	**500/50**	**500/50**

Series 2, Group 1, Scan Phase

	Small	Medium	Large
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**40**	**40**	**40**
Detector Rows	**64.0**	**64.0**	**64.0**
Detector Configuration	**64x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Large Body**	**Large Body**	**Large Body**
Pitch	**0.516**	**0.516**	**0.516**
Speed (mm/rot)	**20.60**	**20.60**	**20.60**
Rotation Time (s)	**0.5**	**0.5**	**0.5**
kV	**100**	**120**	**140**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(25-190)**	**(30-290)**	**(30-340)**
Manual mA	**120.0**	**140.0**	**190.0**
Noise Index	**15.5**	**18.0**	**23.0**
Slice Thickness (mm)	**5**	**5**	**5**
Interval (mm)	**3.0**	**3.0**	**3.0**

Series 2, Group 1, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**30**	**40**	**50**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**2500/350**	**2500/350**	**2500/350**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option			
ASiR/ASiR256/DLIR	**None**	**None**	**None**
Slice Thickness (mm)	**5.0**	**5.0**	**5.0**
Interval (mm)	**3.0**	**3.0**	**3.0**

Series 2, Group 2, Scan Phase

	Small	Medium	Large
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**40**	**40**	**40**
Detector Rows	**64.0**	**64.0**	**64.0**
Detector Configuration	**64x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Large Body**	**Large Body**	**Large Body**
Pitch	**0.516**	**0.516**	**0.516**
Speed (mm/rot)	**20.60**	**20.60**	**20.60**
Rotation Time (s)	**0.5**	**0.5**	**0.5**
kV	**100**	**120**	**140**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(10-60)**	**(10-100)**	**(10-110)**
Manual mA	**40.0**	**50.0**	**60.0**
Noise Index	**13.5**	**15.5**	**20.0**
Slice Thickness (mm)	**5**	**5**	**5**
Interval (mm)	**3.0**	**3.0**	**3.0**

Series 2, Group 2, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**30**	**40**	**50**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**2500/350**	**2500/350**	**2500/350**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option			
ASiR/ASiR256/DLIR	**None**	**None**	**None**
Slice Thickness (mm)	**5.0**	**5.0**	**5.0**
Interval (mm)	**3.0**	**3.0**	**3.0**

Series 2, Group 3, Scan Phase

	Small	Medium	Large
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**40**	**40**	**40**
Detector Rows	**64.0**	**64.0**	**64.0**
Detector Configuration	**64x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Large Body**	**Large Body**	**Large Body**
Pitch	**0.516**	**0.516**	**0.516**
Speed (mm/rot)	**20.60**	**20.60**	**20.60**
Rotation Time (s)	**0.5**	**0.5**	**0.5**
kV	**100**	**120**	**140**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(10-60)**	**(10-100)**	**(10-110)**
Manual mA	**40.0**	**50.0**	**60.0**
Noise Index	**13.5**	**15.5**	**20.0**
Slice Thickness (mm)	**5**	**5**	**5**
Interval (mm)	**3.0**	**3.0**	**3.0**

Series 2, Group 3, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**30**	**40**	**50**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**2500/350**	**2500/350**	**2500/350**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option			
ASiR/ASiR256/DLIR	**None**	**None**	**None**
Slice Thickness (mm)	**5.0**	**5.0**	**5.0**
Interval (mm)	**3.0**	**3.0**	**3.0**

Soft Tissue Extremity with IV Contrast 9.24/9.25/9.26

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Pediatric Patients Under 13 years of age: See Appendix for Technique Instruction, Guidance for pediatric extremity MSK protocols

Indication

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).
- If it is unclear, please clarify with the Radiologist/ Ordering Provider.

Oral Contrast

None

Pre-Scan Instructions

If scanning the arm

- Patient positioned prone with affected extremity overhead in "superman" position and positioned in the center of the scanner. Non-affected extremity (with IV) at patient's side.

If scanning the legs

- Place feet close together, straight, and near the center of the scanner.

IV Contrast Parameters 350

Medrad™ P3T Abdomen protocol, Ulrich Routine Body Adult, or UW ConCal for weight based contrast.

Iohexol (Omnipaque) 350 mg/mL injection at a rate of 3 mL/sec

Rate: As appropriate for IV access (up to 3mL/sec)

Delay: 90sec

For sites without the Medrad™ P3T or UW ConCal option, refer to the weight based contrast tables we provide in the protocol booklet.

IV Contrast Parameters 300/370

Medrad™ P3T Abdomen protocol.

Iohexol (Omnipaque) 300 mg/mL injection at a rate of 3 mL/sec

Rate: As appropriate for IV access (up to 3mL/sec)

Delay: 90sec

For sites without the Medrad™ P3T or P3T PA option, refer to the weight based contrast tables we provide in the protocol booklet.

Field of View

Same as previous study or as small as appropriate

Scan Description

- Series 1 - PA and lateral scouts
- Series 2 - Helical Scan
  - Coverage:
    - Variable: according to radiologist's order. Only scan the extremity of interest.
    - If ordered, perform an additional reconstruction at a FOV wide enough to cover both legs (if a lower extremity). For this extra recon, there will be a recon already set-up, you just need to turn it on. It should be at 5 mm by 2.5 mm and a standard kernel. If you have an order for both legs, you can turn on the 2 recons following the bilateral recon. This is set up for the opposite leg in both standard and bone plus, you will just need to turn it on.
  - Timing: 90 seconds from the start of the injection.

Reformat Instructions

No special instructions for the standard reformats for this protocol.

- **If a HD/GSI Scan**: Recons & Reformats: Do all reformats specific for this protocol on the 140 keV BonePlus recon (QC is recon 1) and send to ALI_Store.

Reformats

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
AX	Thin Soft Tissue	Manual	Average	450/50	3	1.5	axial
CO	Thin Soft Tissue	Manual	Average	450/50	3	1.5	coronal
SA	Thin Soft Tissue	Manual	Average	450/50	3	1.5	sagittal

Networking

- All images are networked to PACS (ALI_Store).
- Note: If smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

Miscellaneous

None

Acquisition Parameters

Series 1, Scout

	Small	Medium	Large
Scout 1 kV	100	120	140
Scout 1 mA	10	10	10
Scout 1 Angle	180	180	180
Scout 2 kV	100	120	140
Scout 2 mA	40	40	80
Scout 2 Angle	90	90	90
WW/WL for Scout	500/50	500/50	500/50

Series 2, Scan Phase

	Small	Medium	Large
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**40**	**40**	**40**
Detector Rows	**64.0**	**64.0**	**64.0**
Detector Configuration	**64x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Large Body**	**Large Body**	**Large Body**
Pitch	**0.984**	**0.984**	**0.984**
Speed (mm/rot)	**39.40**	**39.40**	**39.40**
Rotation Time (s)	**0.5**	**0.5**	**0.5**
kV	**100**	**100**	**120**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(80-480)**	**(90-480)**	**(110-560)**
Manual mA	**240.0**	**380.0**	**530.0**
Noise Index	**12.0**	**18.5**	**22.5**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Series 2, Recons

	Small	Medium	Large
Recon 1 (Primary)			
DFOV	**30**	**30**	**30**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**
Recon 2 (Secondary)			
DFOV	**22**	**22**	**22**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**2500/350**	**2500/350**	**2500/350**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**	**None**	**None**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

If your Scanner has MAR software, turn this additional recon "ON" in the presence of metal.

MAR	Small	Medium	Large
Recon 3 (Secondary)			
DFOV	**30**	**30**	**30**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
Recon Option	**MARS On**	**MARS On**	**MARS On**
ASiR/ASiR256/DLIR	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Chest - Standard (Routine and High-Resolution) 15.1.1/15.2.1/15.4.1/15.6.1/15.8.1

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Indication

Chest with contrast: Initial evaluations for metastatic disease.

Chest without contrast: Follow-up osteosarcoma mets

Video for this protocol

Oral Contrast

None

Pre-Scan Instructions

- To properly select a pediatric protocol size:
  - First use the patient's age to select scout parameters
  - After acquiring the scout, measure the PA + Lateral widths
  - Scan using the protocol corresponding to the sum of the AP+Lateral measurements (you may need to select a protocol that does not match the patient's age)

Color Grouping	Pink	Red/Purple	Yellow/White	Blue/Orange	Green/Black
Age	Newborn	6 mo - 2.5 yr	3-7 yr	8-12 yr	13-18 yr
PA + Lat (cm)	0-26	27-31	32-37	38-43	44-60

- If the patient is bigger than 60 cm scan in a Medium Adult protocol and perform the adult reformats. If the patient requires an adult medium or large protocol, please delete the abd/pel group and extend the chest through the pelvis, **scan in one group**, **not two**.

IV Contrast Parameters 350

Patient Weight	Contrast Dosage	Injection Rate
Peds < 37 kg (81.5 lbs)	1.7 mL/kg of Iohexol 350 mgI/mL + 10 mL NaCl flush	1.5- 2 mL/sec
Peds > 37kg (81.5 lbs)	64 mL Iohexol 350 mgI/mL + 30 mL NaCl flush	1.5 - 2 mL/sec
Injection Rate variable, depending on the size of patient and IV gauge.		

IV Contrast Parameters 300/370

Patient Weight	Contrast Dosage	Injection Rate
Peds < 37 kg (81.5 lbs)	2 mL/kg of Iohexol 300 mgI/mL + 10 mL NaCl flush	1.5- 2 mL/sec
Peds > 37kg (81.5 lbs)	75 mL Iohexol 300 mgI/mL + 30 mL NaCl flush	1.5 - 2 mL/sec
Injection Rate variable, depending on the size of patient and IV guage.		

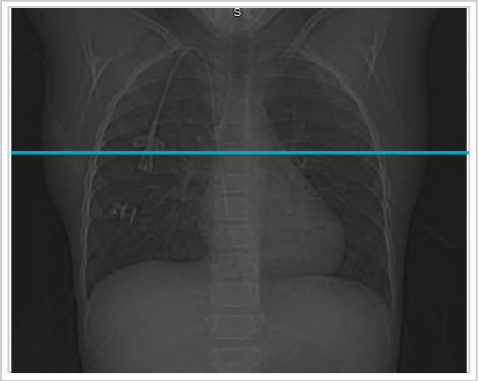
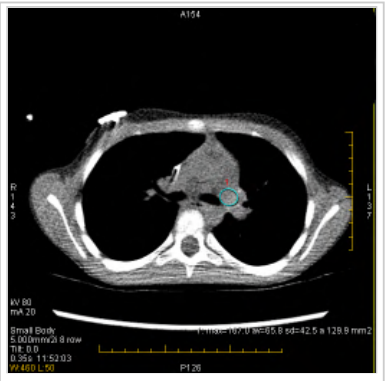
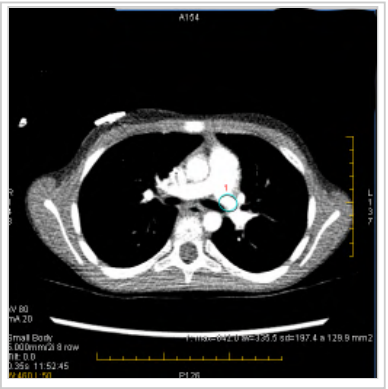
Field of View

Small as possible, including all of chest wall

Scan Description

- Series 1 – PA & Lateral Scout: from base of neck through lung bases with inspiration
- Series 2 – Scan Phase: Scan from just above the lung apices and extend through lung bases with full inspiration.

- Smart Prep – Monitor Phase: center over the pulmonary artery. Once it reaches the proper threshold, hit scan phase. The scan will then have a 12 second diagnostic delay built in. If enhancement threshold is not reach by 50 seconds, start the scan.

- Series 3 (optional) - Sequential/Axial Supine Expiration (only if requested by radiologist) Start just above the lung apices and extend through the lung bases. These scans have a slice thickness of 1.25 mm and an interval of 10 mm.

Reformat Instructions

Use DMPR on recon 2 and recon 4

- Recon 2 is the Soft Tissue Recon
- Recon 4 is the Lung Recon

Reformats

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
SA PEDS CHEST	THIN ST	DMPR	Average	450/50	4	2	sagittal
CO PEDS CHEST	THIN ST	DMPR	Average	450/50	4	2	coronal
PEDS SA CHEST	THIN LUNG	DMPR	Average	1500/-700	4	2	sagittal
PEDS CO CHEST	THIN LUNG	DMPR	Average	1500/-700	4	2	coronal
AX MIPS	THIN ST	Manual	MIP	1500/-700	10	5	Axial

Networking

- All Images to PACS (ALI_Store).
- Note: if smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

Miscellaneous

None

Acquisition Parameters

Series 1, Scout

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-60 cm
Scout 1 kV	**80**	**80**	**80**	**80**	**100**
Scout 1 mA	**10**	**10**	**10**	**10**	**10**
Scout 1 Angle	**180**	**180**	**180**	**180**	**180**
Scout 2 kV	**80**	**80**	**80**	**80**	**100**
Scout 2 mA	**40**	**40**	**40**	**40**	**40**
Scout 2 Angle	**90**	**90**	**90**	**90**	**90**
WW/WL for Scout	**500/50**	**500/50**	**500/50**	**500/50**	**500/50**

Series 2, Smart Prep

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-60 cm
mA	**20**	**40**	**40**	**40**	**40**
Monitoring Delay (sec)	**20.0**	**20.0**	**20.0**	**20.0**	**20.0**
Monitoring ISD (sec)	**2.0**	**2.0**	**2.0**	**2.0**	**2.0**
Enhancement Threshold (HU)	**50**	**50**	**50**	**50**	**50**
Diagnostic Delay	**12**	**12**	**12**	**12**	**12**

Series 2, Scan Phase

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-60 cm
Scan Type	**Helical**	**Helical**	**Helical**	**Helical**	**Helical**
Beam Collimation	**40**	**40**	**40**	**40**	**40**
Detector Rows	**64.0**	**64.0**	**64.0**	**64.0**	**64.0**
Detector Configuration	**64x0.625**	**64x0.625**	**64x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Small Body**	**Small Body**	**Small Body**	**Large Body**	**Large Body**
Pitch	**1.375**	**1.375**	**1.375**	**1.375**	**1.375**
Speed (mm/rot)	**55.00**	**55.00**	**55.00**	**55.00**	**55.00**
Rotation Time (s)	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**
kV	**80**	**80**	**80**	**80**	**100**
AEC type	**smart mA**	**smart mA**	**smart mA**	**smart mA**	**smart mA**
mA Range	**(10-70)**	**(15-90)**	**(25-150)**	**(50-310)**	**(60-390)**
Manual mA	**50.0**	**60.0**	**90.0**	**200.0**	**250.0**
Noise Index	**13.0**	**14.5**	**16.5**	**18.5**	**18.0**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.25**	**2.25**	**2.25**	**2.25**	**2.25**

Series 2, Recons

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-60 cm
Recon 1 (Primary)					
DFOV	**20**	**20**	**20**	**25**	**25**
Recon Type	**Detail**	**Detail**	**Detail**	**Detail**	**Detail**
WW/WL	**450/50**	**450/50**	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**	**Plus**	**Plus**
Recon Option					
ASiR/ASiR256/DLIR	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.25**	**2.25**	**2.25**	**2.25**	**2.25**
Recon 2 (Secondary)					
DFOV	**20**	**20**	**20**	**25**	**25**
Recon Type	**Detail**	**Detail**	**Detail**	**Detail**	**Detail**
WW/WL	**450/50**	**450/50**	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**	**0.625**	**0.625**
Recon 3 (Secondary)					
DFOV	**20**	**20**	**20**	**25**	**25**
Recon Type	**BonePlus**	**BonePlus**	**BonePlus**	**Bone Plus**	**Bone Plus**
WW/WL	**1500/-700**	**1500/-700**	**1500/-700**	**1500/-700**	**1500/-700**
Recon Option	**Plus**	**Plus**	**Plus**	**Plus**	**Plus**
Recon Option					
ASiR/ASiR256/DLIR	**None**	**None**	**None**	**None**	**None**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.25**	**2.25**	**2.25**	**2.25**	**2.25**
Recon 4 (Secondary)					
DFOV	**20**	**20**	**20**	**25**	**25**
Recon Type	**BonePlus**	**BonePlus**	**BonePlus**	**Bone Plus**	**Bone Plus**
WW/WL	**1500/-700**	**1500/-700**	**1500/-700**	**1500/-700**	**1500/-700**
Recon Option	**Plus**	**Plus**	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**	**None**	**None**	**None**	**None**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**	**0.625**	**0.625**

Series 3, Scout

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-60 cm
Scout 1 kV	**80**	**80**	**80**	**80**	**100**
Scout 1 mA	**10**	**10**	**10**	**10**	**10**
Scout 1 Angle	**180**	**180**	**180**	**180**	**180**
Scout 2 kV	**80**	**80**	**80**	**80**	**100**
Scout 2 mA	**40**	**40**	**40**	**40**	**40**
Scout 2 Angle	**90**	**90**	**90**	**90**	**90**
WW/WL for Scout	**500/50**	**500/50**	**500/50**	**500/50**	**500/50**

Series 4, Scan Phase

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-60 cm
Scan Type	**Axial**	**Axial**	**Axial**	**Axial**	**Axial**
Beam Collimation	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**
Detector Rows	**2.0**	**2.0**	**2.0**	**2.0**	**2.0**
Detector Configuration	**2x0.625**	**2x0.625**	**2x0.625**	**2x0.625**	**2x0.625**
Scan FOV	**Small Body**	**Small Body**	**Small Body**	**Large Body**	**Large Body**
Pitch	**1**	**1**	**1**	**1**	**1**
Speed (mm/rot)	**1.30**	**1.30**	**1.30**	**1.30**	**1.30**
Rotation Time (s)	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**
kV	**80**	**80**	**80**	**80**	**100**
AEC type	**smart mA**	**smart mA**	**smart mA**	**smart mA**	**smart mA**
mA Range	**(10-50)**	**(10-70)**	**(15-110)**	**(35-230)**	**(45-280)**
Manual mA	**30.0**	**40.0**	**70.0**	**140.0**	**180.0**
Noise Index	**22.0**	**25.5**	**28.5**	**32.5**	**31.5**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**
Interval (mm)	**10**	**10**	**10**	**10**	**10**

Series 4, Recons

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-60 cm
Recon 1 (Primary)					
DFOV	**20**	**20**	**20**	**25**	**25**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**1500/-700**	**1500/-700**	**1500/-700**	**1500/-700**	**1500/-700**
Recon Option	**Full**	**Full**	**Full**	**Full**	**Full**
Recon Option					
ASiR/ASiR256/DLIR	**None**	**None**	**None**	**None**	**None**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**
Interval (mm)	**10**	**10**	**10**	**10**	**10**

Peds Chest Dynamic 3D Airway 15.1.2/15.2.2/15.4.2/15.6.2/15.8.2

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Indication

Evaluate airway for stenosis, tumor, tracheo(broncho)malacia.

Oral Contrast

None

Pre-Scan Instructions

Practice breathing instructions. Ask patient to cough just prior to the scan. **Coach patient again before expiration. Expiratory scan should be performed during *forced exhalation* (use manual breathing instructions)**

- To properly select a pediatric protocol size:
  - First use the patient's age to select scout parameters
  - After acquiring the scout, measure the PA + Lateral widths
  - Scan using the protocol corresponding to the sum of the AP+Lateral measurements (you may need to select a protocol that does not match the patient's age)

Color Grouping	Pink	Red/Purple	Yellow/White	Blue/Orange	Green/Black
Age	Newborn	6 mo - 2.5 yr	3-7 yr	8-12 yr	13-18 yr
PA + Lat (cm)	0-26	27-31	32-37	38-43	44-60

- If the patient is bigger than 60 cm scan in a Medium Adult protocol and perform the adult reformats.

IV Contrast Parameters 350

Weight Ranges	Contrast Dosage	Injection Rate
<34 kg (<75 lbs)	1.7 mL/kg Iohexol 350 mgI/mL + 30 mL NaCl flush	1.5 - 3 mL/sec
35-58 kg (75-129 lbs)	69 mL Iohexol 350 mgI/mL + 30 mL NaCl flush	1.5 - 3 mL/sec
>59 kg (>130 lbs)	Patients above 46 kg use the "Use Medrad P3T or UW-ConCal Routine Peds Calculator Protocol" with Iohexol 350mgI/mL + 30mL NaCl flush.	1.5 - 3 mL/sec
Injection Rate variable, depending on the size of patient and IV guage.		

For sites without the Ulrich use Medrad p3T or refer to the weight based contrast tables included with the protocol booklet.

IV Contrast Parameters 300/370

Weight Ranges	Contrast Dosage	Injection Rate
<40 kg (<100 lbs)	2 mL/kg Iohexol 300 mgI/mL + 30 mL NaCl flush	1.5 - 3 mL/sec
45-65 kg (100-140 lbs)	80 mL Iohexol 300 mgI/mL + 30 mL NaCl flush	1.5 - 3 mL/sec
>65 kg (>140 lbs)	Patients above 65 kg use the Medrad™ P3T for volume of Iohexol 300mgI/mL + 30mL NaCl flush.	1.5 - 3 mL/sec
Injection Rate variable, depending on the size of patient and IV guage.		

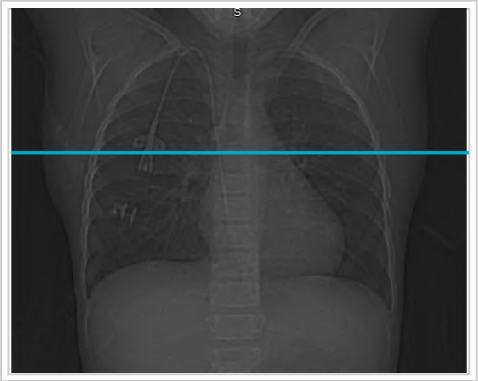
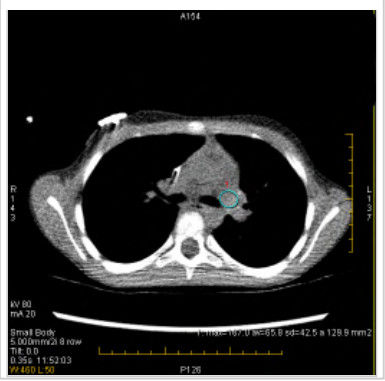
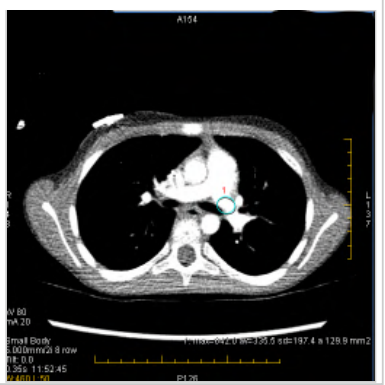
For sites without the Medrad™ P3T or P3T PA option, refer to the weight based contrast tables we provide in the protocol booklet.

Field of View

Small as possible, including all of chest wall

Scan Description

- **Series 1** - PA & lateral scouts: from lower neck to diaphragm on inspiration.
- **Series 2** - Inspiration: Start scan mid-neck C3 – C4 and extend through the diaphragm to include entirety of lungs. If the patient needs IV contrast use this phase.
  - Smart Prep – Monitor Phase: center over the pulmonary artery. Once it reaches the proper threshold, hit scan phase. The scan will then have a 12 second diagnostic delay built in. If enhancement threshold is not reach by 50 seconds, start the scan.

- **Series 3** - Dynamic forced expiration: Start scan mid-neck C3 – C4 and extend through top of diaphragm
  - Positioning: Supine for both the Inspiration and Expiration series.

Reformat Instructions

No reformats unless requested by a Radiologist

Reformats

None.

Networking

- All Images to PACS (ALI_Store).
- Note: if smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

Miscellaneous

None

Acquisition Parameters

Series 1, Scout

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-60 cm
Scout 1 kV	**80**	**80**	**80**	**80**	**100**
Scout 1 mA	**10**	**10**	**10**	**10**	**10**
Scout 1 Angle	**180**	**180**	**180**	**180**	**180**
Scout 2 kV	**80**	**80**	**80**	**80**	**100**
Scout 2 mA	**40**	**40**	**40**	**40**	**40**
Scout 2 Angle	**90**	**90**	**90**	**90**	**90**
WW/WL for Scout	**500/50**	**500/50**	**500/50**	**500/50**	**500/50**

Series 2, Smart Prep

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-60 cm
mA	**20**	**40**	**40**	**40**	**40**
Monitoring Delay (sec)	**20.0**	**20.0**	**20.0**	**20.0**	**20.0**
Monitoring ISD (sec)	**2.0**	**2.0**	**2.0**	**2.0**	**2.0**
Enhancement Threshold (HU)	**50**	**50**	**50**	**50**	**50**
Diagnostic Delay	**12**	**12**	**12**	**12**	**12**

Series 2, Scan Phase

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-60 cm
Scan Type	**Helical**	**Helical**	**Helical**	**Helical**	**Helical**
Beam Collimation	**40**	**40**	**40**	**40**	**40**
Detector Rows	**64.0**	**64.0**	**64.0**	**64.0**	**64.0**
Detector Configuration	**64x0.625**	**64x0.625**	**64x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Small Body**	**Small Body**	**Small Body**	**Large Body**	**Large Body**
Pitch	**1.375**	**1.375**	**1.375**	**1.375**	**1.375**
Speed (mm/rot)	**55.00**	**55.00**	**55.00**	**55.00**	**55.00**
Rotation Time (s)	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**
kV	**80**	**80**	**80**	**80**	**100**
AEC type	**smart mA**	**smart mA**	**smart mA**	**smart mA**	**smart mA**
mA Range	**(10-70)**	**(15-90)**	**(25-150)**	**(50-310)**	**(60-390)**
Manual mA	**50.0**	**60.0**	**90.0**	**200.0**	**250.0**
Noise Index	**13.0**	**14.5**	**16.5**	**18.5**	**18.0**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.25**	**2.25**	**2.25**	**2.25**	**2.25**

Series 2, Recons

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-60 cm
Recon 1 (Primary)					
DFOV	**20**	**20**	**20**	**25**	**25**
Recon Type	**Detail**	**Detail**	**Detail**	**Detail**	**Detail**
WW/WL	**450/50**	**450/50**	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**	**Plus**	**Plus**
Recon Option					
ASiR/ASiR256/DLIR	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.25**	**2.25**	**2.25**	**2.25**	**2.25**
Recon 2 (Secondary)					
DFOV	**20**	**20**	**20**	**25**	**25**
Recon Type	**Detail**	**Detail**	**Detail**	**Detail**	**Detail**
WW/WL	**450/50**	**450/50**	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**	**0.625**	**0.625**
Recon 3 (Secondary)					
DFOV	**20**	**20**	**20**	**25**	**25**
Recon Type	**BonePlus**	**BonePlus**	**BonePlus**	**Bone Plus**	**Bone Plus**
WW/WL	**1500/-700**	**1500/-700**	**1500/-700**	**1500/-700**	**1500/-700**
Recon Option	**Plus**	**Plus**	**Plus**	**Plus**	**Plus**
Recon Option					
ASiR/ASiR256/DLIR	**None**	**None**	**None**	**None**	**None**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.25**	**2.25**	**2.25**	**2.25**	**2.25**
Recon 4 (Secondary)					
DFOV	**20**	**20**	**20**	**25**	**25**
Recon Type	**BonePlus**	**BonePlus**	**BonePlus**	**Bone Plus**	**Bone Plus**
WW/WL	**1500/-700**	**1500/-700**	**1500/-700**	**1500/-700**	**1500/-700**
Recon Option	**Plus**	**Plus**	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**	**None**	**None**	**None**	**None**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**	**0.625**	**0.625**

Series 3, Scan Phase

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-60 cm
Scan Type	**Helical**	**Helical**	**Helical**	**Helical**	**Helical**
Beam Collimation	**40**	**40**	**40**	**40**	**40**
Detector Rows	**64.0**	**64.0**	**64.0**	**64.0**	**64.0**
Detector Configuration	**64x0.625**	**64x0.625**	**64x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Small Body**	**Small Body**	**Small Body**	**Large Body**	**Large Body**
Pitch	**1.375**	**1.375**	**1.375**	**1.375**	**1.375**
Speed (mm/rot)	**55.00**	**55.00**	**55.00**	**55.00**	**55.00**
Rotation Time (s)	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**
kV	**80**	**80**	**80**	**80**	**100**
AEC type	**smart mA**	**smart mA**	**smart mA**	**smart mA**	**smart mA**
mA Range	**(10-70)**	**(15-90)**	**(25-150)**	**(50-310)**	**(60-390)**
Manual mA	**50.0**	**60.0**	**90.0**	**200.0**	**250.0**
Noise Index	**13.0**	**14.5**	**16.5**	**18.5**	**18.0**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.25**	**2.25**	**2.25**	**2.25**	**2.25**

Series 3, Recons

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-60 cm
Recon 1 (Primary)					
DFOV	**20**	**20**	**20**	**25**	**25**
Recon Type	**Detail**	**Detail**	**Detail**	**Detail**	**Detail**
WW/WL	**450/50**	**450/50**	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**	**Plus**	**Plus**
Recon Option					
ASiR/ASiR256/DLIR	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.25**	**2.25**	**2.25**	**2.25**	**2.25**
Recon 2 (Secondary)					
DFOV	**20**	**20**	**20**	**25**	**25**
Recon Type	**Detail**	**Detail**	**Detail**	**Detail**	**Detail**
WW/WL	**450/50**	**450/50**	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**	**0.625**	**0.625**
Recon 3 (Secondary)					
DFOV	**20**	**20**	**20**	**25**	**25**
Recon Type	**BonePlus**	**BonePlus**	**BonePlus**	**Bone Plus**	**Bone Plus**
WW/WL	**1500/-700**	**1500/-700**	**1500/-700**	**1500/-700**	**1500/-700**
Recon Option	**Plus**	**Plus**	**Plus**	**Plus**	**Plus**
Recon Option					
ASiR/ASiR256/DLIR	**None**	**None**	**None**	**None**	**None**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.25**	**2.25**	**2.25**	**2.25**	**2.25**
Recon 4 (Secondary)					
DFOV	**20**	**20**	**20**	**25**	**25**
Recon Type	**BonePlus**	**BonePlus**	**BonePlus**	**Bone Plus**	**Bone Plus**
WW/WL	**1500/-700**	**1500/-700**	**1500/-700**	**1500/-700**	**1500/-700**
Recon Option	**Plus**	**Plus**	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**	**None**	**None**	**None**	**None**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**	**0.625**	**0.625**

Chest Pectus 15.1.3/15.2.3/15.4.3/15.6.3/15.8.3

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Indication

Eval for chest wall deformities, Haller index and corrections indices in pectus excavatum.

Video for this protocol

Oral Contrast

None

Pre-Scan Instructions

- To properly select a pediatric protocol size:
  - First use the patient's age to select scout parameters
  - After acquiring the scout, measure the PA + Lateral widths
  - Scan using the protocol corresponding to the sum of the AP+Lateral measurements (you may need to select a protocol that does not match the patient's age)

Color Grouping	Pink	Red/Purple	Yellow/White	Blue/Orange	Green/Black
Age	Newborn	6 mo - 2.5 yr	3-7 yr	8-12 yr	13-18 yr
PA + Lat (cm)	0-26	27-31	32-37	38-43	44-60

- If the patient is bigger than 60 cm scan in a Medium Adult protocol and perform the adult reformats. If the patient requires an adult medium or large protocol, please delete the abd/pel group and extend the chest through the pelvis, **scan in one group**, **not two**.

IV Contrast Parameters

None

Field of View

Small as possible, including all of rib cage

Scan Description

- Series 1 – PA & Lateral Scout: from base of neck through lung bases with suspension.
- Series 2 – Scan from just above the lung apices and extend through the 12th rib so as to image the entire bony thorax. Scan using suspension (stop breathing).

Reformat Instructions

Use DMPR on recon 2 and recon 4

- Recon 2 is the Soft Tissue Recon
- Recon 4 is the Lung Recon

Reformats

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
SA PEDS CHEST	THIN ST	DMPR	Average	450/50	4	2	sagittal
CO PEDS CHEST	THIN ST	DMPR	Average	450/50	4	2	coronal
PEDS SA CHEST	THIN LUNG	DMPR	Average	1500/-700	4	2	sagittal
PEDS CO CHEST	THIN LUNG	DMPR	Average	1500/-700	4	2	coronal
AX MIPS	THIN ST	Manual	MIP	1500/-700	10	5	Axial

Networking

- All Images to PACS (ALI_Store).
- Note: if smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

Miscellaneous

None

Acquisition Parameters

Series 1, Scout

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-60 cm
Scout 1 kV	80	80	80	80	100
Scout 1 mA	10	10	10	10	10
Scout 1 Angle	180	180	180	180	180
Scout 2 kV	80	80	80	80	100
Scout 2 mA	40	40	40	40	40
Scout 2 Angle	90	90	90	90	90
WW/WL for Scout	500/50	500/50	500/50	500/50	500/50

Series 2, Scan Phase

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-60 cm
Scan Type	Helical	Helical	Helical	Helical	Helical
Beam Collimation	20	20	20	40	40
Detector Rows	32.0	32.0	32.0	64.0	64.0
Detector Configuration	32x0.625	32x0.625	32x0.625	64x0.625	64x0.625
Scan FOV	Small Body	Small Body	Small Body	Large Body	Large Body
Pitch	1.375	1.375	1.375	1.375	1.375
Speed (mm/rot)	27.50	27.50	27.50	55.00	55.00
Rotation Time (s)	0.5	0.5	0.5	0.5	0.5
kV	80	80	80	80	100
AEC type	smart mA	smart mA	smart mA	smart mA	smart mA
mA Range	(10-50)	(10-70)	(15-100)	(35-220)	(45-270)
Manual mA	30.0	40.0	70.0	140.0	170.0
Noise Index	15.5	17.5	19.5	22.5	21.5
Slice Thickness (mm)	3.75	3.75	3.75	3.75	3.75
Interval (mm)	2.25	2.25	2.25	2.25	2.25

Series 2, Recons

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-60 cm
Recon 1 (Primary)					
DFOV	**20**	**20**	**20**	**25**	**25**
Recon Type	**Detail**	**Detail**	**Detail**	**Detail**	**Detail**
WW/WL	**450/50**	**450/50**	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**	**Plus**	**Plus**
Recon Option					
ASiR/ASiR256/DLIR	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.25**	**2.25**	**2.25**	**2.25**	**2.25**
Recon 2 (Secondary)					
DFOV	**20**	**20**	**20**	**25**	**25**
Recon Type	**Detail**	**Detail**	**Detail**	**Detail**	**Detail**
WW/WL	**450/50**	**450/50**	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**	**0.625**	**0.625**
Recon 3 (Secondary)					
DFOV	**20**	**20**	**20**	**25**	**25**
Recon Type	**BonePlus**	**BonePlus**	**BonePlus**	**Bone Plus**	**Bone Plus**
WW/WL	**1500/-700**	**1500/-700**	**1500/-700**	**1500/-700**	**1900/-475**
Recon Option	**Plus**	**Plus**	**Plus**	**Plus**	**Plus**
Recon Option					
ASiR/ASiR256/DLIR	**None**	**None**	**None**	**None**	**None**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.25**	**2.25**	**2.25**	**2.25**	**2.25**
Recon 4 (Secondary)					
DFOV	**20**	**20**	**20**	**25**	**25**
Recon Type	**BonePlus**	**BonePlus**	**BonePlus**	**Bone Plus**	**Bone Plus**
WW/WL	**1500/-700**	**1500/-700**	**1500/-700**	**1500/-700**	**1500/-700**
Recon Option	**Plus**	**Plus**	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**	**None**	**None**	**None**	**None**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**	**0.625**	**0.625**

Chest CTPA for PE 15.1.4/15.2.4/15.4.4/15.6.4/15.8.4

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Indication

known or suspected pulmonary embolism.

Oral Contrast

None

Pre-Scan Instructions

- Practice the 3 breaths for scouts, smart prep, and the actual helical scan, we do not want to induce a Valsalva which would push the contrast out of the area of interest. Ask patient to cough just prior to the exam. Ask patient to breathe quietly during exam and then stop breathing for image acquisition. Inform the patient to not bear up, tense up or strenuously hold their breath. Scan ventilated patients at full inspiration.
- To properly select a pediatric protocol size:
  - First use the patient's age to select scout parameters
  - After acquiring the scout, measure the PA + Lateral widths
  - Scan using the protocol corresponding to the sum of the AP+Lateral measurements (you may need to select a protocol that does not match the patient's age)

Color Grouping	Pink	Red/Purple	Yellow/White	Blue/Orange	Green/Black
Age	Newborn	6 mo - 2.5 yr	3-7 yr	8-12 yr	13-18 yr
PA + Lat (cm)	0-26	27-31	32-37	38-43	44-55

- If the patient is bigger than 60 cm scan in a Medium Adult protocol and perform the adult reformats.

IV Contrast Parameters 350

Weight Ranges	Contrast Dosage	Injection Rate
<34 kg (<75 lbs)	1.7 mL/kg of Iohexol 350 mgI/mL + 10 mL NaCl flush	2 mL/sec
34-58 kg (76-129 lbs)	69 mL Iohexol 350 mgI/mL + 10 mL NaCl flush	3 mL/sec
>59 kg (>130 lbs)	Patients above 59 kilograms use Ulrich weight based ConCal for volume of Iohexol 350mgI/mL + 10mL NaCl flush.	4 mL/sec
Injection Rate variable, depending on the size of patient and IV guage.		

For sites without the Ulrich use Medrad p3T or refer to the weight-based contrast tables included with the protocol booklet.

IV Contrast Parameters 300/370

Weight Ranges	Contrast Dosage	Injection Rate
<40 kg (<88 lbs)	2 mL/kg of Iohexol 300 mgI/mL + 10 mL NaCl flush	2 mL/sec
40-65 kg (88-143 lbs)	80 mL Iohexol 300 mgI/mL + 10 mL NaCl flush	3 mL/sec
>65 kg (>143 lbs)	Patients above 65 kilos use the Medrad™ P3T for volume of Iohexol 300mgI/mL + 10mL NaCl flush.	4 mL/sec
Injection Rate variable, depending on the size of patient and IV guage.		

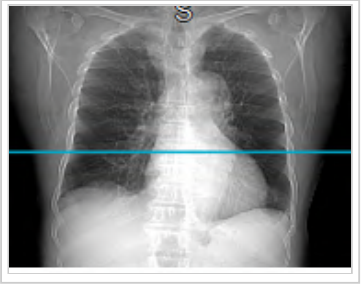
For sites without the Medrad™ P3T or P3T PA option, refer to the weight based contrast tables we provide in the protocol booklet.

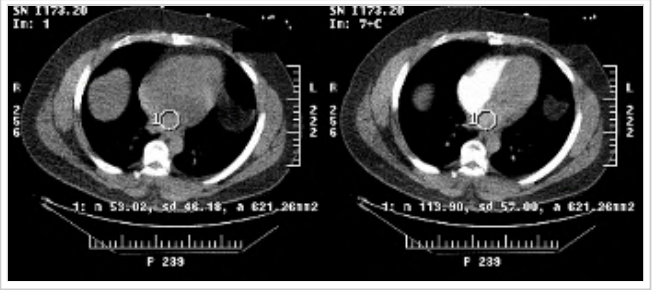
Field of View

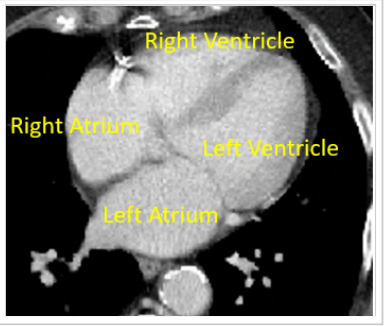
Small as possible, including all of chest wall

Scan Description

- Series 1 - PA and lateral scouts: from lower neck to diaphragm using the suspension breathing instructions
- Series 2 –Helical Scan
  - Scan Phase: Start scan above lung apices (first rib) and scan through lung bases/costophrenic angles with IV Contrast. Inspiratory breathing instructions are on, remind the patient not to bear down or strain.
  - Smart Prep-Monitor Phase: Place ROI on Lt atrium; Watch for atrial filling with contrast on the bolus tracking scan and then start using manual start, no delay is needed.







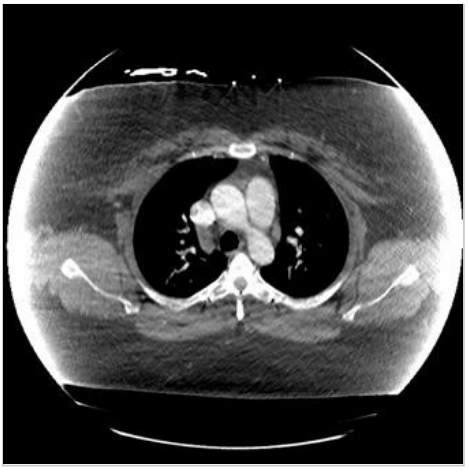
Adjustments for Bariatric PE and Cardiac Studies We do not have a bariatric protocol for chest PE or cardiac (retrospectively or prospectively gated coronaries) studies. Our large protocol is already designed to deliver a higher maximum dose than the medium and small adult protocols, but it uses 120 kV to maximize iodine contrast. Other large adult protocols that are not angiograms use 140 kV for large adults. Therefore, for bariatric patients who 1. **fill the scout view** or 2. **max out the mA table** please increase the kV from 120 kV to 140 kV.

Note: If you know the patient is likely to max out the mA table before taking the scout, you should increase the scout kV from 120 to 140.

Example of a patient **filling the scout view**

Example patient **filling the scout AP view**

Example patient **filling the scout lateral view**



Resulting poor image quality from a patient who **fills the scout**

Reformat Instructions

Use DMPR on recon 2 (thins)

- Recon 2 is the Lung Recon

In the United States, CT Angiography CPT codes require the performance and documentation of 3D angiographic rendering, which may include maximum intensity projection (MIP), volumetric rendering, and/or surface rendering techniques.

Reformats

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
PEDS SA CHEST	THIN LUNG	Manual	MIP	1500/-700	4	2	sagittal
PEDS CO CHEST	THIN LUNG	Manual	MIP	1500/-700	4	2	coronal
AX MIPS	THIN ST	Manual	MIP	1500/-700	10	5	Axial

Networking

- All Images to PACS (ALI_Store).
- Note: if smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

Miscellaneous

None

Acquisition Parameters

Series 1, Scout

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-60 cm
Scout 1 kV	80	80	80	80	100
Scout 1 mA	10	10	10	10	10
Scout 1 Angle	180	180	180	180	180
Scout 2 kV	80	80	80	80	100
Scout 2 mA	40	40	40	40	40
Scout 2 Angle	90	90	90	90	90
WW/WL for Scout	500/50	500/50	500/50	500/50	500/50

Series 2, Smart Prep

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-60 cm
mA	20	40	40	40	40
Monitoring Delay (sec)	10.0	10.0	10.0	10.0	10.0
Monitoring ISD (sec)	1.0	1.0	1.0	1.0	1.0
Enhancement Threshold (HU)	50	50	50	50	50
Diagnostic Delay	Auto Minimum	Auto Minimum	Auto Minimum	Auto Minimum	Auto Minimum

Series 2, Scan Phase

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-60 cm
Scan Type	**Helical**	**Helical**	**Helical**	**Helical**	**Helical**
Beam Collimation	**40**	**40**	**40**	**40**	**40**
Detector Rows	**64.0**	**64.0**	**64.0**	**64.0**	**64.0**
Detector Configuration	**64x0.625**	**64x0.625**	**64x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Small Body**	**Small Body**	**Small Body**	**Large Body**	**Large Body**
Pitch	**1.375**	**1.375**	**1.375**	**1.375**	**1.375**
Speed (mm/rot)	**55.00**	**55.00**	**55.00**	**55.00**	**55.00**
Rotation Time (s)	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**
kV	**80**	**80**	**80**	**80**	**100**
AEC type	**smart mA**	**smart mA**	**smart mA**	**smart mA**	**smart mA**
mA Range	**(10-70)**	**(15-90)**	**(25-150)**	**(50-310)**	**(60-390)**
Manual mA	**50.0**	**60.0**	**90.0**	**200.0**	**250.0**
Noise Index	**22.0**	**25.5**	**28.5**	**32.5**	**31.5**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**	**0.625**	**0.625**

Series 2, Recons

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-60 cm
Recon 1 (Primary)					
DFOV	**20**	**20**	**20**	**25**	**25**
Recon Type	**Detail**	**Detail**	**Detail**	**Detail**	**Detail**
WW/WL	**450/50**	**450/50**	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**	**0.625**	**0.625**
Recon 2 (Secondary)					
DFOV	**20**	**20**	**20**	**25**	**25**
Recon Type	**BonePlus**	**BonePlus**	**BonePlus**	**Bone Plus**	**Bone Plus**
WW/WL	**1500/-700**	**1500/-700**	**1500/-700**	**1500/-700**	**1500/-700**
Recon Option	**Plus**	**Plus**	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**	**None**	**None**	**None**	**None**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**	**0.625**	**0.625**

Routine Chest/Abd/Pelvis 15.1.5/15.2.5/15.4.5/15.6.5/15.8.5

Pediatric patients between the age of 18-20 yrs: to be scanned C/A/P in one scan. Do not scan using two groups.

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Indication

Neoplasm, fever of unknown origin, infection. Metasatic disease workup/follow-up.

Video for this protocol

Oral Contrast

These are target volumes for oral contrast. If the child is vomiting or otherwise unable to tolerate the total amount, it can obviously be decreased. For optimal interpretation of these scans, encourage the above amounts.

Hydrate ER patient if time allows

Mix 4mL Iohexol 300 (Omnipaque) in 200mL of a clear liquid.

Age	Weight (lbs)	Total Oral Contrast Quantity
0 - 1	10 - 25	100 mLs
1 - 3	20 - 40	200 mLs
3 - 5	30 - 60	400 mLs
5 - 10	40 - 90	600 mLs
11+	over 90	800 mLs +

Pre-Scan Instructions

- To properly select a pediatric protocol size:
  - First use the patient's age to select scout parameters
  - After acquiring the scout, measure the PA + Lateral widths
  - Scan using the protocol corresponding to the sum of the AP+Lateral measurements (you may need to select a protocol that does not match the patient's age)

Color Grouping	Pink	Red/Purple	Yellow/White	Blue/Orange	Green/Black
Age	Newborn	6 mo - 2.5 yr	3-7 yr	8-12 yr	13-18 yr
PA + Lat (cm)	0-26	27-31	32-37	38-43	44-60

- If the patient is bigger than 60 cm scan in a Medium Adult protocol and perform the adult reformats. If the patient requires an adult medium or large protocol, please delete the abd/pel group and extend the chest through the pelvis, **scan in one group**, **not two**.

IV Contrast Parameters 350

Weight Ranges	Contrast Dosage	Injection Rate
<34 kg (<75 lbs)	1.7 mL/kg Iohexol 350 mgI/mL + 30 mL NaCl flush	1.5 - 3 mL/sec
35-58 kg (75-129 lbs)	69 mL Iohexol 350 mgI/mL + 30 mL NaCl flush	1.5 - 3 mL/sec
>59 kg (>130 lbs)	Patients above 46 kg use the "Use Medrad P3T or UW-ConCal Routine Peds Calculator Protocol" with Iohexol 350mgI/mL + 30mL NaCl flush.	1.5 - 3 mL/sec
Injection Rate variable, depending on the size of patient and IV guage.		

For sites without the Ulrich use Medrad p3T or refer to the weight based contrast tables included with the protocol booklet.

IV Contrast Parameters 300/370

Weight Ranges	Contrast Dosage	Injection Rate
<40 kg (<100 lbs)	2 mL/kg Iohexol 300 mgI/mL + 30 mL NaCl flush	1.5 - 3 mL/sec
45-65 kg (100-140 lbs)	80 mL Iohexol 300 mgI/mL + 30 mL NaCl flush	1.5 - 3 mL/sec
>65 kg (>140 lbs)	Patients above 65 kg use the Medrad™ P3T for volume of Iohexol 300mgI/mL + 30mL NaCl flush.	1.5 - 3 mL/sec
Injection Rate variable, depending on the size of patient and IV guage.		

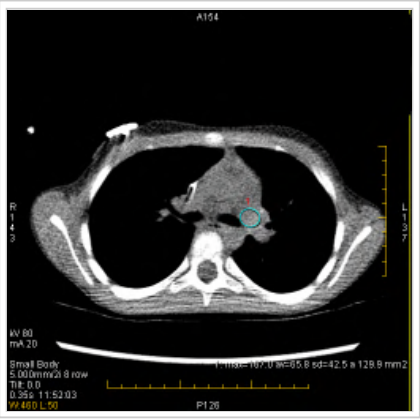
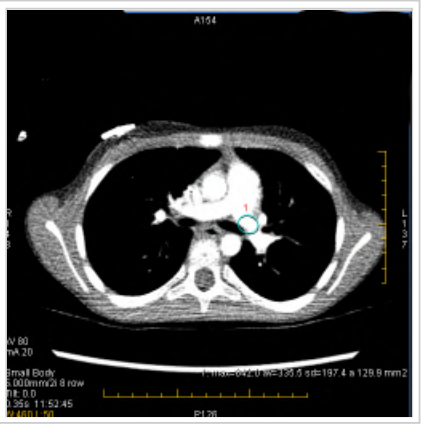
For sites without the Medrad™ P3T or P3T PA option, refer to the weight based contrast tables we provide in the protocol booklet.

Field of View

As small as possible

Scan Description

- Series 1 – PA & Lateral Scout: from base of neck through pubic symphysis
- Series 2 – Helical scan: Start just above the lung apices. For a Chest/Abdomen, end at the iliac crests and for a full CAP end at the pubic symphysis. Scan Chest/ Abdomen/Pelvis in portal venous phase.
  - Coverage: Start just above the lung apices. For a Chest/Abdomen, end at the iliac crests and for a full CAP end at the pubic symphysis.
  - If the patient requires an Adult Medium or Large protocol, please delete the Abd/Pel group and extend the chest through the pelvis, scan in ONE group, not two. Please add a 20 second (all Non-Revolution CT 256) or 27 seconds (Revolution CT 256) diagnostic delay to the smart prep. You may want to turn off your DMPR's and manually preform the reformats.
  - Smart Prep – Monitor Phase: Center over the pulmonary artery. There is a built in diagnostic delay of 20 seconds after the smart prep enhancement threshold is reached.

Reformat Instructions

Use DMPR on recon 2 (thins)

- Recon 2 is the Soft Tissue Recon

Reformats

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
PEDS SA CHEST	THIN LUNG	Manual	Average	1500/-700	4	2	sagittal
PEDS CO CHEST	THIN LUNG	Manual	Average	1500/-700	4	2	coronal
SA PEDS	Thin ST	DMPR	Average	450/50	4	2	sagittal
CO PEDS	Thin ST	DMPR	Average	450/50	4	2	coronal
AX MIPS	THIN ST	Manual	MIP	1500/-700	10	5	Axial

Networking

- All Images to PACS (ALI_Store).
- Note: if smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

Miscellaneous

None

Acquisition Parameters

Series 1, Scout

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-60 cm
Scout 1 kV	80	80	80	80	100
Scout 1 mA	10	10	10	10	10
Scout 1 Angle	180	180	180	180	180
Scout 2 kV	80	80	80	80	100
Scout 2 mA	40	40	40	40	40
Scout 2 Angle	90	90	90	90	90
WW/WL for Scout	500/50	500/50	500/50	500/50	500/50

Series 2, Smart Prep

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-60 cm
mA	20	40	40	40	40
Monitoring Delay (sec)	20.0	20.0	20.0	20.0	20.0
Monitoring ISD (sec)	2.0	2.0	2.0	2.0	2.0
Enhancement Threshold (HU)	30	30	30	30	30
Diagnostic Delay	20	20	20	20	20

Series 2, Scan Phase

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-60 cm
Scan Type	**Helical**	**Helical**	**Helical**	**Helical**	**Helical**
Beam Collimation	**20**	**20**	**20**	**40**	**40**
Detector Rows	**32.0**	**32.0**	**32.0**	**64.0**	**64.0**
Detector Configuration	**32x0.625**	**32x0.625**	**32x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Small Body**	**Small Body**	**Small Body**	**Large Body**	**Large Body**
Pitch	**1.375**	**1.375**	**1.375**	**1.375**	**1.375**
Speed (mm/rot)	**27.50**	**27.50**	**27.50**	**55.00**	**55.00**
Rotation Time (s)	**0.5**	**0.5**	**0.5**	**0.6**	**0.6**
kV	**80**	**80**	**80**	**80**	**100**
AEC type	**smart mA**	**smart mA**	**smart mA**	**smart mA**	**smart mA**
mA Range	**(15-100)**	**(20-130)**	**(30-200)**	**(60-360)**	**(70-440)**
Manual mA	**60.0**	**80.0**	**130.0**	**220.0**	**280.0**
Noise Index	**11.0**	**12.5**	**14.0**	**16.0**	**15.5**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.25**	**2.25**	**2.25**	**2.25**	**2.25**

Series 2, Recons

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-60 cm
Recon 1 (Primary)					
DFOV	**20**	**20**	**20**	**25**	**25**
Recon Type	**Detail**	**Detail**	**Detail**	**Detail**	**Detail**
WW/WL	**450/50**	**450/50**	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**	**Plus**	**Plus**
Recon Option					
ASiR/ASiR256/DLIR	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.25**	**2.25**	**2.25**	**2.25**	**2.25**
Recon 2 (Secondary)					
DFOV	**20**	**20**	**20**	**25**	**25**
Recon Type	**Detail**	**Detail**	**Detail**	**Detail**	**Detail**
WW/WL	**450/50**	**450/50**	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**	**0.625**	**0.625**
Recon 3 (Secondary)					
DFOV	**20**	**20**	**20**	**25**	**25**
Recon Type	**BonePlus**	**BonePlus**	**BonePlus**	**Bone Plus**	**Bone Plus**
WW/WL	**1500/-700**	**1500/-700**	**1500/-700**	**1500/-700**	**1900/-475**
Recon Option	**Plus**	**Plus**	**Plus**	**Plus**	**Plus**
Recon Option					
ASiR/ASiR256/DLIR	**None**	**None**	**None**	**None**	**None**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.25**	**2.25**	**2.25**	**2.25**	**2.25**
Recon 4 (Secondary)					
DFOV	**20**	**20**	**20**	**25**	**25**
Recon Type	**BonePlus**	**BonePlus**	**BonePlus**	**Bone Plus**	**Bone Plus**
WW/WL	**1500/-700**	**1500/-700**	**1500/-700**	**1500/-700**	**1500/-700**
Recon Option	**Plus**	**Plus**	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**	**None**	**None**	**None**	**None**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**	**0.625**	**0.625**

DLIR Limitations:

1. DLIR is not available on the Primary Recon.
2. DLIR is only compatible with the Standard Algorithm. So, in instances where the primary recon is Soft algorithm,(i.e. many Neuro Protocols) the subsequent recons will be in Standard Algorithm to enable DLIR. The slight difference between the Soft and Standard Algorithms is outweighed by the improvement in image quality with DLIR enabled.
3. DLIR requires an interval exactly half of the slice thickness.
4. DLIR doesn't allow an interval of 0.312 mm. So, if you are on a DLIR enabled scanner, the thin 0.625 recon will be at 0.625x0.625 mm. On all other scanners the thin recon will be at 0.625x0.312 mm.

Trauma Chest/Abd/Pelvis 15.1.6/15.2.6/15.4.6/15.6.6/15.8.6

Note: The pediatric Trauma CAP protocol can still be used to retro recon the T Spine. In other words, you should NEVER scan both a Trauma pediatric CAP and then a T Spine protocol.

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Indication

Blunt or penetrating trauma

Video for this protocol

Oral Contrast

None

Pre-Scan Instructions

- Clamp Foley catheter prior to exam. Make sure to place Foley below the level of the bladder.
- Image with arms up if possible.
- To properly select a pediatric protocol size:
  - First use the patient's age to select scout parameters
  - After acquiring the scout, measure the PA + Lateral widths
  - Scan using the protocol corresponding to the sum of the AP+Lateral measurements (you may need to select a protocol that does not match the patient's age)

Color Grouping	Pink	Red/Purple	Yellow/White	Blue/Orange	Green/Black
Age	Newborn	6 mo - 2.5 yr	3-7 yr	8-12 yr	13-18 yr
PA + Lat (cm)	0-26	27-31	32-37	38-43	44-55

- If the patient is bigger than 60 cm scan in a Medium Adult protocol and perform the adult reformats.

IV Contrast Parameters 350

Weight Ranges	Contrast Dosage	Injection Rate
<34 kg (<75 lbs)	1.7 mL/kg Iohexol 350 mgI/mL + 30 mL NaCl flush	1.5 - 3 mL/sec
35-58 kg (75-129 lbs)	69 mL Iohexol 350 mgI/mL + 30 mL NaCl flush	1.5 - 3 mL/sec
>59 kg (>130 lbs)	Patients above 46 kg use the "Use Medrad P3T or UW-ConCal Routine Peds Calculator Protocol" with Iohexol 350mgI/mL + 30mL NaCl flush.	1.5 - 3 mL/sec
Injection Rate variable, depending on the size of patient and IV guage.		

For sites without the Ulrich use Medrad p3T or refer to the weight based contrast tables included with the protocol booklet.

IV Contrast Parameters 300/370

Weight Ranges	Contrast Dosage	Injection Rate
<40 kg (<100 lbs)	2 mL/kg Iohexol 300 mgI/mL + 30 mL NaCl flush	1.5 - 3 mL/sec
45-65 kg (100-140 lbs)	80 mL Iohexol 300 mgI/mL + 30 mL NaCl flush	1.5 - 3 mL/sec
>65 kg (>140 lbs)	Patients above 65 kg use the Medrad™ P3T for volume of Iohexol 300mgI/mL + 30mL NaCl flush.	1.5 - 3 mL/sec
Injection Rate variable, depending on the size of patient and IV guage.		

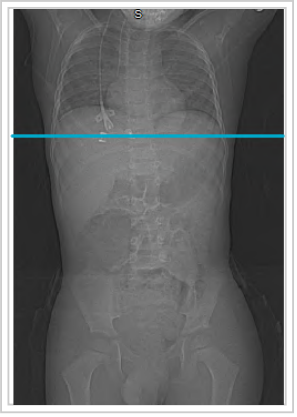
For sites without the Medrad™ P3T or P3T PA option, refer to the weight based contrast tables we provide in the protocol booklet.

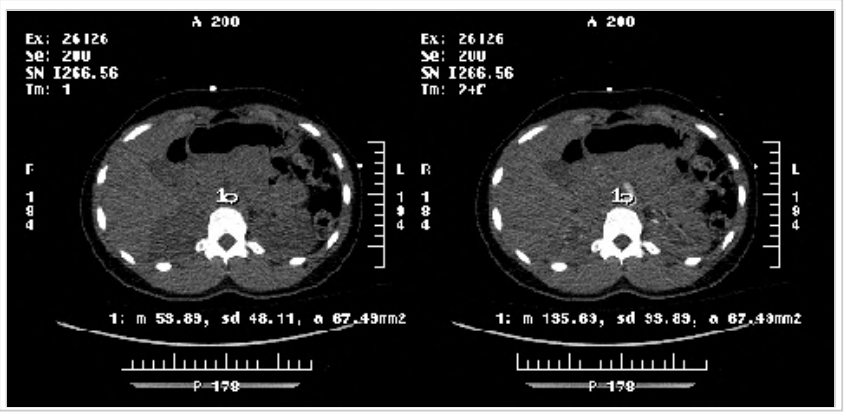
Field of View

As small as possible

Scan Description

- **Series 1** – PA & Lateral Scout: from base of neck through pubic symphysis
- **Series 2** – Helical Scan – Helical Scan: Performed in 2 groups: Chest (1st group) – Abdomen and Pelvis (2nd group)
  - 1st group, scanned bottom-up. Start scan mid L1 (for the t-spine recons) and scan to the top of the lungs (apex).
  - 2nd group, pause 70 sec. from the start of the injection, start scan at the top of the diaphragm and end at the pubic symphysis.
- Smart Prep – Monitor Phase: Center over the liver. Put ROI in the aorta. Start scan as soon as contrast is seen in the aorta.





- **Series 3** - Delayed Scan (Optional per MD) 5-7 minute delayed scans ONLY in area of interest

Reformat Instructions

Use DMPR on recon 2 (thins)

- Recon 2 is a Soft Tissue Recon
- Recon 4 & 7 are Spine Soft Tissue Recon
- Recon 6 & 9 are Spine Bone Recon

Reformats

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
SA PEDS CHEST	Thin ST	DMPR	Average	450/50	4	2	sagittal
CO PEDS CHEST	Thin ST	DMPR	Average	450/50	4	2	coronal
SA PEDS	Thin ST	DMPR	Average	450/50	4	2	sagittal
CO PEDS	Thin ST	DMPR	Average	450/50	4	2	coronal

For T and L Spine reformats

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
SA ST	Thin ST	Manual (spines only if ordered)	Average	450/50	2	1	sagittal
CO ST	Thin ST	Manual (spines only if ordered)	Average	450/50	2	1	coronal
SA BONE	Thin Bone	Manual (spines only if ordered)	Average	3000/300	2	1	sagittal
CO BONE	Thin Bone	Manual (spines only if ordered)	Average	3000/300	2	1	coronal

Networking

- All Images to PACS (ALI_Store).
- Note: if smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

Miscellaneous

None

Acquisition Parameters

Series 1, Scout

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-60 cm
Scout 1 kV	80	80	80	80	100
Scout 1 mA	10	10	10	10	10
Scout 1 Angle	180	180	180	180	180
Scout 2 kV	80	80	80	80	100
Scout 2 mA	40	40	40	40	40
Scout 2 Angle	90	90	90	90	90
WW/WL for Scout	500/50	500/50	500/50	500/50	500/50

Series 2, Smart Prep

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-60 cm
mA	20	40	40	40	40
Monitoring Delay (sec)	10.0	10.0	10.0	10.0	15.0
Monitoring ISD (sec)	2.0	2.0	2.0	2.0	2.0
Enhancement Threshold (HU)	50	50	50	50	50
Diagnostic Delay	Auto Minimum	Auto Minimum	Auto Minimum	Auto Minimum	Auto Minimum

Series 2, Group 1, Scan Phase

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-60 cm
Scan Type	**Helical**	**Helical**	**Helical**	**Helical**	**Helical**
Beam Collimation	**20**	**20**	**20**	**40**	**40**
Detector Rows	**32.0**	**32.0**	**32.0**	**64.0**	**64.0**
Detector Configuration	**32x0.625**	**32x0.625**	**32x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Small Body**	**Small Body**	**Small Body**	**Large Body**	**Large Body**
Pitch	**1.375**	**1.375**	**1.375**	**1.375**	**1.375**
Speed (mm/rot)	**27.50**	**27.50**	**27.50**	**55.00**	**55.00**
Rotation Time (s)	**0.5**	**0.5**	**0.5**	**1**	**1**
kV	**80**	**80**	**80**	**80**	**100**
AEC type	**smart mA**	**smart mA**	**smart mA**	**smart mA**	**smart mA**
mA Range	**(30-180)**	**(35-220)**	**(60-350)**	**(60-370)**	**(70-470)**
Manual mA	**110.0**	**140.0**	**220.0**	**230.0**	**300.0**
Noise Index	**8.5**	**9.5**	**10.5**	**12.0**	**11.5**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.25**	**2.25**	**2.25**	**2.25**	**2.25**

Series 2, Group 1, Recons

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-60 cm
Recon 1 (Primary)					
DFOV	**20**	**20**	**20**	**25**	**25**
Recon Type	**Detail**	**Detail**	**Detail**	**Detail**	**Detail**
WW/WL	**450/50**	**450/50**	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**	**Plus**	**Plus**
Recon Option					
ASiR/ASiR256/DLIR	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.25**	**2.25**	**2.25**	**2.25**	**2.25**
Recon 2 (Secondary)					
DFOV	**20**	**20**	**20**	**25**	**25**
Recon Type	**Detail**	**Detail**	**Detail**	**Detail**	**Detail**
WW/WL	**450/50**	**450/50**	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**	**0.625**	**0.625**

Recon 3 (Secondary)					
DFOV	20	20	20	25	25
Recon Type	BonePlus	BonePlus	BonePlus	Bone Plus	Bone Plus
WW/WL	1500/-700	1500/-700	1500/-700	1500/-700	1500/-700
Recon Option	Plus	Plus	Plus	Plus	Plus
Recon Option	IQ Enhance	IQ Enhance	IQ Enhance	IQ Enhance	IQ Enhance
ASiR/ASiR256/DLIR	None	None	None	None	None
Slice Thickness (mm)	1.25	1.25	1.25	1.25	1.25
Interval (mm)	0.625	0.625	0.625	0.625	0.625
Recon 4 (Secondary)					
DFOV	16	16	16	16	16
Recon Type	Soft	Soft	Soft	Soft	Soft
WW/WL	450/50	450/50	450/50	450/50	450/50
Recon Option	Plus	Plus	Plus	Plus	Plus
Recon Option	IQ Enhance	IQ Enhance	IQ Enhance	IQ Enhance	IQ Enhance
ASiR/ASiR256/DLIR	60% / 30% / High	60% / 30% / High	60% / 30% / High	60% / 30% / High	60% / 30% / High
Slice Thickness (mm)	1.25	1.25	1.25	1.25	1.25
Interval (mm)	0.625	0.625	0.625	0.625	0.625
Recon 5 (Secondary)					
DFOV	16	16	16	16	16
Recon Type	Bone Plus	Bone Plus	Bone Plus	Bone Plus	Bone Plus
WW/WL	2500/350	2500/350	2500/350	2500/350	2500/350
Recon Option	Plus	Plus	Plus	Plus	Plus
Recon Option	IQ Enhance	IQ Enhance	IQ Enhance	IQ Enhance	IQ Enhance
ASiR/ASiR256/DLIR	None	None	None	None	None
Slice Thickness (mm)	1.25	1.25	1.25	1.25	1.25
Interval (mm)	0.625	0.625	0.625	0.625	0.625
Recon 6 (Secondary)					
DFOV	16	16	16	16	16
Recon Type	Bone Plus	Bone Plus	Bone Plus	Bone Plus	Bone Plus
WW/WL	2500/350	2500/350	2500/350	2500/350	2500/350
Recon Option	Plus	Plus	Plus	Plus	Plus
Recon Option	IQ Enhance	IQ Enhance	IQ Enhance	IQ Enhance	IQ Enhance
ASiR/ASiR256/DLIR	None	None	None	None	None
Slice Thickness (mm)	0.625	0.625	0.625	0.625	0.625
Interval (mm)	0.312	0.312	0.312	0.312	0.312

DLIR Limitations:

1. DLIR is not available on the Primary Recon.
2. DLIR is only compatible with the Standard Algorithm. So, in instances where the primary recon is Soft algorithm,(i.e. many Neuro Protocols) the subsequent recons will be in Standard Algorithm to enable DLIR. The slight difference between the Soft and Standard Algorithms is outweighed by the improvement in image quality with DLIR enabled.
3. DLIR requires an interval exactly half of the slice thickness.
4. DLIR doesn't allow an interval of 0.312 mm. So, if you are on a DLIR enabled scanner, the thin 0.625 recon will be at 0.625x0.625 mm. On all other scanners the thin recon will be at 0.625x0.312 mm.

Series 2, Group2, Scan Phase

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-60 cm
Scan Type	**Helical**	**Helical**	**Helical**	**Helical**	**Helical**
Beam Collimation	**20**	**20**	**20**	**40**	**40**
Detector Rows	**32.0**	**32.0**	**32.0**	**64.0**	**64.0**
Detector Configuration	**32x0.625**	**32x0.625**	**32x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Small Body**	**Small Body**	**Small Body**	**Large Body**	**Large Body**
Pitch	**1.375**	**1.375**	**1.375**	**1.375**	**1.375**
Speed (mm/rot)	**27.50**	**27.50**	**27.50**	**55.00**	**55.00**
Rotation Time (s)	**0.5**	**0.5**	**0.5**	**1**	**1**
kV	**80**	**80**	**80**	**80**	**100**
AEC type	**smart mA**	**smart mA**	**smart mA**	**smart mA**	**smart mA**
mA Range	**(30-180)**	**(35-220)**	**(60-350)**	**(60-370)**	**(70-470)**
Manual mA	**110.0**	**140.0**	**220.0**	**230.0**	**300.0**
Noise Index	**8.5**	**9.5**	**10.5**	**12.0**	**11.5**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.25**	**2.25**	**2.25**	**2.25**	**2.25**

Series 2, Group2, Recons

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-60 cm
Recon 1 (Primary)					
DFOV	**20**	**20**	**20**	**25**	**25**
Recon Type	**Detail**	**Detail**	**Detail**	**Detail**	**Detail**
WW/WL	**450/50**	**450/50**	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**	**Plus**	**Plus**
Recon Option					
ASiR/ASiR256/DLIR	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.25**	**2.25**	**2.25**	**2.25**	**2.25**
Recon 2 (Secondary)					
DFOV	**20**	**20**	**20**	**25**	**25**
Recon Type	**Detail**	**Detail**	**Detail**	**Detail**	**Detail**
WW/WL	**450/50**	**450/50**	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**	**0.625**	**0.625**
Recon 7 (Secondary)					
DFOV	**16**	**16**	**16**	**16**	**16**
Recon Type	**Soft**	**Soft**	**Soft**	**Soft**	**Soft**
WW/WL	**450/50**	**450/50**	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**60% / 30% / High**	**60% / 30% / High**	**60% / 30% / High**	**60% / 30% / High**	**60% / 30% / High**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**	**0.625**	**0.625**

Recon 8 (Secondary)					
DFOV	**16**	**16**	**16**	**16**	**16**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**2500/350**	**2500/350**	**2500/350**	**2500/350**	**2500/350**
Recon Option	**Plus**	**Plus**	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**	**None**	**None**	**None**	**None**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**	**0.625**	**0.625**
Recon 9 (Secondary)					
DFOV	**16**	**16**	**16**	**16**	**16**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**2500/350**	**2500/350**	**2500/350**	**2500/350**	**2500/350**
Recon Option	**Plus**	**Plus**	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**	**None**	**None**	**None**	**None**
Slice Thickness (mm)	**0.625**	**0.625**	**0.625**	**0.625**	**0.625**
Interval (mm)	**0.312**	**0.312**	**0.312**	**0.312**	**0.312**

16 & 32 Slice Scanner Exceptions:

1. The 0.625mm slice thickness x 0.312mm interval Recon should be 1.25mm slice thickness x 0.625mm interval on 16 and 32 slice CT scanners. The 16 and 32 slice scanners are only able to recon down to 0.625mm slice thickness when using 10mm and/or 20mm beam collimation respectively. However, when using 20mm and/or 40mm beam collimation, they are only capable of reconstructing to 1.25mm slice thickness.
2. MARS feature is not an option.
3. IQ Enhance feature requires thin slices (1.25mm or less) with an interval of half (or less). On older scanner models, in order to enable IQ Enhance at 0.625 mm slice thickness, the interval must be set to 0.311 mm instead of 0.312 mm.

DLIR Limitations:

1. DLIR is not available on the Primary Recon.
2. DLIR is only compatible with the Standard Algorithm. So, in instances where the primary recon is Soft algorithm,(i.e. many Neuro Protocols) the subsequent recons will be in Standard Algorithm to enable DLIR. The slight difference between the Soft and Standard Algorithms is outweighed by the improvement in image quality with DLIR enabled.
3. DLIR requires an interval exactly half of the slice thickness.
4. DLIR doesn't allow an interval of 0.312 mm. So, if you are on a DLIR enabled scanner, the thin 0.625 recon will be at 0.625x0.625 mm. On all other scanners the thin recon will be at 0.625x0.312 mm.

Series 3, Scan Phase

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-60 cm
Scan Type	**Helical**	**Helical**	**Helical**	**Helical**	**Helical**
Beam Collimation	**20**	**20**	**20**	**40**	**40**
Detector Rows	**32.0**	**32.0**	**32.0**	**64.0**	**64.0**
Detector Configuration	**32x0.625**	**32x0.625**	**32x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Small Body**	**Small Body**	**Small Body**	**Large Body**	**Large Body**
Pitch	**1.375**	**1.375**	**1.375**	**1.375**	**1.375**
Speed (mm/rot)	**27.50**	**27.50**	**27.50**	**55.00**	**55.00**
Rotation Time (s)	**0.5**	**0.5**	**0.5**	**0.6**	**0.6**
kV	**80**	**80**	**80**	**80**	**100**
AEC type	**smart mA**	**smart mA**	**smart mA**	**smart mA**	**smart mA**
mA Range	**(15-100)**	**(20-130)**	**(30-200)**	**(60-360)**	**(70-440)**
Manual mA	**60.0**	**80.0**	**130.0**	**220.0**	**280.0**
Noise Index	**11.0**	**12.5**	**14.0**	**16.0**	**15.5**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.25**	**2.25**	**2.25**	**2.25**	**2.25**

Series 3, Recons

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-60 cm
Recon 1 (Primary)					
DFOV	**20**	**20**	**20**	**25**	**25**
Recon Type	**Detail**	**Detail**	**Detail**	**Detail**	**Detail**
WW/WL	**450/50**	**450/50**	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**	**Plus**	**Plus**
Recon Option					
ASiR/ASiR256/DLIR	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.25**	**2.25**	**2.25**	**2.25**	**2.25**
Recon 2 (Secondary)					
DFOV	**20**	**20**	**20**	**25**	**25**
Recon Type	**Detail**	**Detail**	**Detail**	**Detail**	**Detail**
WW/WL	**450/50**	**450/50**	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**	**0.625**	**0.625**

Routine Abd/Pelvis 16.1.1/16.2.1/16.4.1/16.6.1/16.8.1

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Indication

Abdominal pain, r/o abscess, neoplasm, fever of unknown origin. Small bowel obstruction in patients with h/o prior surgery.

Video for this protocol

Oral Contrast

These are target volumes for oral contrast. If the child is vomiting or otherwise unable to tolerate the total amount, it can obviously be decreased. For optimal interpretation of these scans, encourage the above amounts.

Hydrate ER patient if time allows

Mix 4mL Iohexol 300 (Omnipaque) in 200mL of a clear liquid.

Age	Weight (lbs)	Total Oral Contrast Quantity
0 - 1	10 - 25	100 mLs
1 - 3	20 - 40	200 mLs
3 - 5	30 - 60	400 mLs
5 - 10	40 - 90	600 mLs
11+	over 90	800 mLs +

Pre-Scan Instructions

- To properly select a pediatric protocol size:
  - First use the patient's age to select scout parameters
  - After acquiring the scout, measure the PA + Lateral widths
  - Scan using the protocol corresponding to the sum of the AP+Lateral measurements (you may need to select a protocol that does not match the patient's age)

Color Grouping	Pink	Red/Purple	Yellow/White	Blue/Orange	Green/Black
Age	Newborn	6 mo - 2.5 yr	3-7 yr	8-12 yr	13-18 yr
PA + Lat (cm)	0-26	27-31	32-37	38-43	44-60

- If the patient is bigger than 60 cm scan in a Medium Adult protocol and perform the adult reformats. If the patient requires an adult medium or large protocol, please delete the abd/pel group and extend the chest through the pelvis, **scan in one group**, **not two**.

IV Contrast Parameters 350

Weight Ranges	Contrast Dosage	Injection Rate
<34 kg (<75 lbs)	1.7 mL/kg Iohexol 350 mgI/mL + 30 mL NaCl flush	1.5 - 3 mL/sec
35-58 kg (75-129 lbs)	69 mL Iohexol 350 mgI/mL + 30 mL NaCl flush	1.5 - 3 mL/sec
>59 kg (>130 lbs)	Patients above 46 kg use the "Use Medrad P3T or UW-ConCal Routine Peds Calculator Protocol" with Iohexol 350mgI/mL + 30mL NaCl flush.	1.5 - 3 mL/sec
Injection Rate variable, depending on the size of patient and IV guage.		

For sites without the Ulrich use Medrad p3T or refer to the weight based contrast tables included with the protocol booklet.

IV Contrast Parameters 300/370

Weight Ranges	Contrast Dosage	Injection Rate
<40 kg (<100 lbs)	2 mL/kg Iohexol 300 mgI/mL + 30 mL NaCl flush	1.5 - 3 mL/sec
45-65 kg (100-140 lbs)	80 mL Iohexol 300 mgI/mL + 30 mL NaCl flush	1.5 - 3 mL/sec
>65 kg (>140 lbs)	Patients above 65 kg use the Medrad™ P3T for volume of Iohexol 300mgI/mL + 30mL NaCl flush.	1.5 - 3 mL/sec
Injection Rate variable, depending on the size of patient and IV guage.		

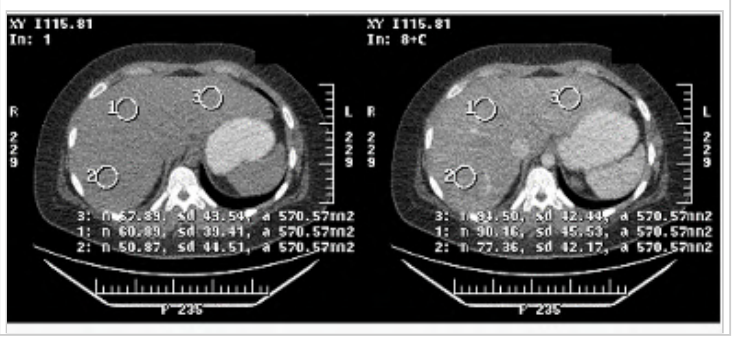
For sites without the Medrad™ P3T or P3T PA option, refer to the weight based contrast tables we provide in the protocol booklet.

Field of View

As small as possible

Scan Description

- Series 1 – PA & Lateral Scout: from diaphragm through pubic symphysis.
- Series 2 – Scan Phase: Start scan just above the diaphragm, end just below the pubic symphysis. If patient has inflammatory bowel disease, scan through perineum.
    - Smart Prep – Monitor Phase: Center over the liver. Place 3 ROIs in the liver. If enhancement threshold is not reach by 70 seconds, start the scan.



Reformat Instructions

Use DMPR on THIN ST.

Reformats

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
SA PEDS	Thin ST	DMPR	Average	500/80	4	2	sagittal
CO PEDS	Thin ST	DMPR	Average	500/80	4	2	coronal

Networking

- All Images to PACS (ALI_Store).
- Note: if smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

Miscellaneous

None

Acquisition Parameters

Series 1, Scout

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-60 cm
Scout 1 kV	**80**	**80**	**80**	**80**	**100**
Scout 1 mA	**10**	**10**	**10**	**10**	**10**
Scout 1 Angle	**180**	**180**	**180**	**180**	**180**
Scout 2 kV	**80**	**80**	**80**	**80**	**100**
Scout 2 mA	**40**	**40**	**40**	**40**	**40**
Scout 2 Angle	**90**	**90**	**90**	**90**	**90**
WW/WL for Scout	**500/50**	**500/50**	**500/50**	**500/50**	**500/50**

Series 2, Smart Prep

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-60 cm
mA	**20**	**40**	**40**	**40**	**40**
Monitoring Delay (sec)	**20.0**	**20.0**	**25.0**	**25.0**	**30.0**
Monitoring ISD (sec)	**2.0**	**2.0**	**2.0**	**2.0**	**2.0**
Enhancement Threshold (HU)	**50**	**50**	**50**	**50**	**50**
Diagnostic Delay	**Auto Minimum**	**Auto Minimum**	**Auto Minimum**	**Auto Minimum**	**Auto Minimum**

Series 2, Scan Phase

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-60 cm
Scan Type	**Helical**	**Helical**	**Helical**	**Helical**	**Helical**
Beam Collimation	**20**	**20**	**20**	**40**	**40**
Detector Rows	**32.0**	**32.0**	**32.0**	**64.0**	**64.0**
Detector Configuration	**32x0.625**	**32x0.625**	**32x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Small Body**	**Small Body**	**Small Body**	**Large Body**	**Large Body**
Pitch	**1.375**	**1.375**	**1.375**	**1.375**	**1.375**
Speed (mm/rot)	**27.50**	**27.50**	**27.50**	**55.00**	**55.00**
Rotation Time (s)	**0.5**	**0.5**	**0.5**	**0.6**	**0.6**
kV	**80**	**80**	**80**	**80**	**100**
AEC type	**smart mA**	**smart mA**	**smart mA**	**smart mA**	**smart mA**
mA Range	**(15-100)**	**(20-130)**	**(30-200)**	**(60-360)**	**(70-440)**
Manual mA	**60.0**	**80.0**	**130.0**	**220.0**	**280.0**
Noise Index	**11.0**	**12.5**	**14.0**	**16.0**	**15.5**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.25**	**2.25**	**2.25**	**2.25**	**2.25**

Series 2, Recons

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-60 cm
Recon 1 (Primary)					
DFOV	**20**	**20**	**20**	**25**	**25**
Recon Type	**Detail**	**Detail**	**Detail**	**Detail**	**Detail**
WW/WL	**450/50**	**450/50**	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**	**Plus**	**Plus**
Recon Option					
ASiR/ASiR256/DLIR	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.25**	**2.25**	**2.25**	**2.25**	**2.25**
Recon 2 (Secondary)					
DFOV	**20**	**20**	**20**	**25**	**25**
Recon Type	**Detail**	**Detail**	**Detail**	**Detail**	**Detail**
WW/WL	**450/50**	**450/50**	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**	**0.625**	**0.625**

DLIR Limitations:

1. DLIR is not available on the Primary Recon.
2. DLIR is only compatible with the Standard Algorithm. So, in instances where the primary recon is Soft algorithm,(i.e. many Neuro Protocols) the subsequent recons will be in Standard Algorithm to enable DLIR. The slight difference between the Soft and Standard Algorithms is outweighed by the improvement in image quality with DLIR enabled.
3. DLIR requires an interval exactly half of the slice thickness.
4. DLIR doesn't allow an interval of 0.312 mm. So, if you are on a DLIR enabled scanner, the thin 0.625 recon will be at 0.625x0.625 mm. On all other scanners the thin recon will be at 0.625x0.312 mm.

Renal Stone/Flank Pain 16.1.1/16.2.1/16.4.1/16.6.1/16.8.1

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Indication

Suspected urolithiasis in setting of equivocal renal/bladder ultrasound.

Video for this protocol

Oral Contrast

Give a total 800 mL of water prior to scan (A 200mL dose every 20 minutes over an hour).

Give an additional 200mL dose of water on the CT scan table.

Hydrate ER patients if time allows

Pre-Scan Instructions

- Scan with a full bladder.
- To properly select a pediatric protocol size:
  - First use the patient's age to select scout parameters
  - After acquiring the scout, measure the PA + Lateral widths
  - Scan using the protocol corresponding to the sum of the AP+Lateral measurements (you may need to select a protocol that does not match the patient's age)

Color Grouping	Pink	Red/Purple	Yellow/White	Blue/Orange	Green/Black
Age	Newborn	6 mo - 2.5 yr	3-7 yr	8-12 yr	13-18 yr
PA + Lat (cm)	0-26	27-31	32-37	38-43	44-55

- If the patient is bigger than 60 cm scan in a Medium Adult protocol and perform the adult reformats.

IV Contrast Parameters

None

Field of View

As small as possible

Scan Description

- Series 1 – PA & Lateral Scout: from diaphragm through pubic symphysis
- Series 2 – Scan from top of kidneys to base of bladder

Reformat Instructions

Use DMPR on THIN ST.

Reformats

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
SA PEDS	Thin ST	DMPR	Average	450/50	4	2	sagittal
CO PEDS	Thin ST	DMPR	Average	450/50	4	2	coronal

Networking

- All Images to PACS (ALI_Store).
- Note: if smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

Miscellaneous

None

Acquisition Parameters

Same as Routine Abd/Pelvis 16.1.1/16.2.1/16.4.1/16.6.1/16.8.1

Acute Appendicitis - Abd/Pelvis 16.1.1/16.2.1/16.4.1/16.6.1/16.8.1

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Indication

RLQ pain. Evaluate for appendicitis.

Video for this protocol

Oral Contrast

None

Pre-Scan Instructions

- To properly select a pediatric protocol size:
  - First use the patient's age to select scout parameters
  - After acquiring the scout, measure the PA + Lateral widths
  - Scan using the protocol corresponding to the sum of the AP+Lateral measurements (you may need to select a protocol that does not match the patient's age)

Color Grouping	Pink	Red/Purple	Yellow/White	Blue/Orange	Green/Black
Age	Newborn	6 mo - 2.5 yr	3-7 yr	8-12 yr	13-18 yr
PA + Lat (cm)	0-26	27-31	32-37	38-43	44-60

- If the patient is bigger than 60 cm scan in a Medium Adult protocol and perform the adult reformats. If the patient requires an adult medium or large protocol, please delete the abd/pel group and extend the chest through the pelvis, **scan in one group**, **not two**.

IV Contrast Parameters 350

Weight Ranges	Contrast Dosage	Injection Rate
<34 kg (<75 lbs)	1.7 mL/kg Iohexol 350 mgI/mL + 30 mL NaCl flush	1.5 - 3 mL/sec
35-58 kg (75-129 lbs)	69 mL Iohexol 350 mgI/mL + 30 mL NaCl flush	1.5 - 3 mL/sec
>59 kg (>130 lbs)	Patients above 46 kg use the "Use Medrad P3T or UW-ConCal Routine Peds Calculator Protocol" with Iohexol 350mgI/mL + 30mL NaCl flush.	1.5 - 3 mL/sec
Injection Rate variable, depending on the size of patient and IV guage.		

For sites without the Ulrich use Medrad p3T or refer to the weight based contrast tables included with the protocol booklet.

IV Contrast Parameters 300/370

Weight Ranges	Contrast Dosage	Injection Rate
<40 kg (<100 lbs)	2 mL/kg Iohexol 300 mgI/mL + 30 mL NaCl flush	1.5 - 3 mL/sec
45-65 kg (100-140 lbs)	80 mL Iohexol 300 mgI/mL + 30 mL NaCl flush	1.5 - 3 mL/sec
>65 kg (>140 lbs)	Patients above 65 kg use the Medrad™ P3T for volume of Iohexol 300mgI/mL + 30mL NaCl flush.	1.5 - 3 mL/sec
Injection Rate variable, depending on the size of patient and IV guage.		

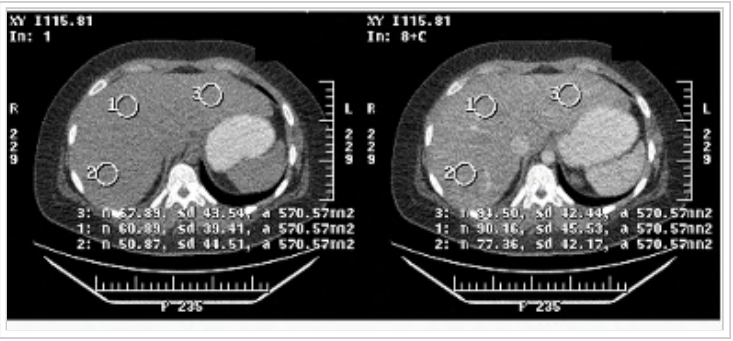
For sites without the Medrad™ P3T or P3T PA option, refer to the weight based contrast tables we provide in the protocol booklet.

Field of View

As small as possible

Scan Description

- Series 1 – PA & Lateral Scout: from diaphragm through pubic symphysis
- Series 2 – Limited Coverage: Start scan at bottom of kidneys, end at pubic symphysis.
  - Smart Prep – Monitor Phase: Center over the liver. Place 3 ROIs in the liver. If enhancement threshold is not reach by 70 seconds, start the scan.



Reformat Instructions

Use DMPR on THIN ST.

Reformats

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
SA PEDS	Thin ST	DMPR	Average	450/50	4	2	sagittal
CO PEDS	Thin ST	DMPR	Average	450/50	4	2	coronal

Networking

- All Images to PACS (ALI_Store).
- Note: if smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

Miscellaneous

None

Acquisition Parameters

This protocol uses the same acquisition parameters as the Routine Abdomen/Pelvis.

CTA ABD - Triphasic Liver 16.1.3/16.2.3/16.4.3/16.6.3/16.8.3

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Indication

preoperative planning, liver tumor evaluation, evaluate hepatic artery/portal vein patency,upon surgeon request. Alternatively, MR with eovist contrast might be helpful.

Video for this protocol

Oral Contrast

Give a total 800 mL of water over the course of one hour prior to scan. Ask patient to drink slowly and steadily.

Give an additional 200mL dose of water on the CT scan table.

Pre-Scan Instructions

- To properly select a pediatric protocol size:
  - First use the patient's age to select scout parameters
  - After acquiring the scout, measure the PA + Lateral widths
  - Scan using the protocol corresponding to the sum of the AP+Lateral measurements (you may need to select a protocol that does not match the patient's age)

Color Grouping	Pink	Red/Purple	Yellow/White	Blue/Orange	Green/Black
Age	Newborn	6 mo - 2.5 yr	3-7 yr	8-12 yr	13-18 yr
PA + Lat (cm)	0-26	27-31	32-37	38-43	44-60

- If the patient is bigger than 60 cm scan in a Medium Adult protocol and perform the adult reformats. If the patient requires an adult medium or large protocol, please delete the abd/pel group and extend the chest through the pelvis, **scan in one group**, **not two**.

IV Contrast Parameters 350

Weight Ranges	Contrast Dosage	Injection Rate
<34 kg (<75 lbs)	1.7 mL/kg of Iohexol 350 mgI/mL + 30 mL NaCl flush	2 mL/sec
34-44 kg (75-100 lbs)	69 mL Iohexol 350 mgI/mL + 40 mL NaCl flush	3 mL/sec
>45 kg (>101 lbs)	Patients above 45 kilos use Medrad P3T Weight based or UW ConCal Weight Based Routine Ped for volume of Iohexol 350mgI/mL + 50mL NaCl flush.	4 mL/sec
Injection Rate variable, depending on the size of patient and IV gauge.		

For sites without the Ulrich use Medrad p3T or refer to the weight-based contrast tables included with the protocol booklet.

IV Contrast Parameters 300/370

Weight Ranges	Contrast Dosage	Injection Rate
<40 kg (<88 lbs)	2 mL/kg of Iohexol 300 mgI/mL + 30 mL NaCl flush	2 mL/sec
40-65 kg (88-143 lbs)	80 mL Iohexol 300 mgI/mL + 40 mL NaCl flush	3 mL/sec
>65 kg (>143 lbs)	Patients above 65 kilos use the Medrad™ P3T for volume of Iohexol 300mgI/mL + 50mL NaCl flush.	4 mL/sec
Injection Rate variable, depending on the size of patient and IV guage.		

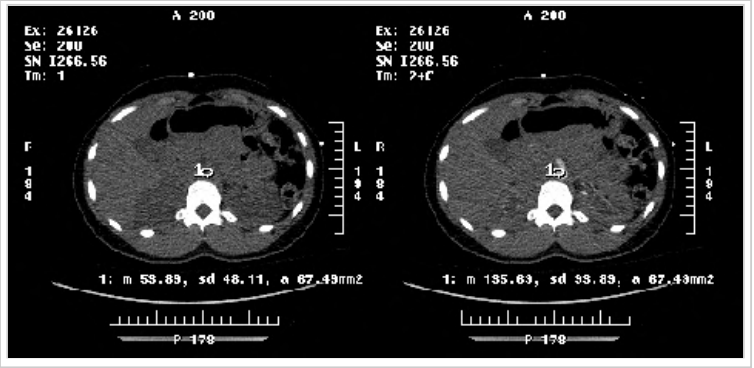
For sites without the Medrad™ P3T or P3T PA option, refer to the weight based contrast tables we provide in the protocol booklet.

Field of View

As small as possible

Scan Description

- **Series 1** – PA and lateral scout: from diaphragm through iliac crest (or pubic symphysis if pelvis also ordered)
- **Series 2** – Helical Scan performed in 3 groups
  - 1st group - Arterial Phase: Start scan just above the liver and end just below the bottom of the liver or proximal SMA which ever is lower.
  - 2nd group - Late Arterial Phase: Start scan just below the liver (same coordinates and table positions) and end just above the liver. This group is scanned bottom up.
  - 3rd group – Portal Venous Phase: 70 seconds after the start of the injection, start scan just above the liver and end at the iliac crests for the Abdomen or at pubic symphysis for the Abdomen/Pelvis
- Smart Prep - Monitor Phase - Place ROI on the aorta at the level of mid liver. **Dynamic transition is turned on so the scan will progress without the need for you to hit 'scan phase'.** Prep Group delays are pre-programmed for the Late Arterial and Portal venous phases.



Reformat Instructions

Use DMPR on THIN ST.

In the United States, CT Angiography CPT codes require the performance and documentation of 3D angiographic rendering, which may include maximum intensity projection (MIP), volumetric rendering, and/or surface rendering techniques.

Reformats

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
SA PEDS	Thin ST	DMPR	Average	450/50	4	2	sagittal
CO PEDS	Thin ST	DMPR	Average	450/50	4	2	coronal

Networking

- All Images to PACS (ALI_Store).
- Note: if smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

Miscellaneous

None

Acquisition Parameters

Series 1, Scout

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-60 cm
Scout 1 kV	**80**	**80**	**80**	**80**	**100**
Scout 1 mA	**10**	**10**	**10**	**10**	**10**
Scout 1 Angle	**180**	**180**	**180**	**180**	**180**
Scout 2 kV	**80**	**80**	**80**	**80**	**100**
Scout 2 mA	**40**	**40**	**40**	**40**	**40**
Scout 2 Angle	**90**	**90**	**90**	**90**	**90**
WW/WL for Scout	**500/50**	**500/50**	**500/50**	**500/50**	**500/50**

Series 2, Smart Prep

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-60 cm
mA	**10**	**10**	**10**	**20**	**20**
Monitoring Delay (sec)	**10.0**	**10.0**	**10.0**	**10.0**	**10**
Monitoring ISD (sec)	**2.0**	**2.0**	**2.0**	**2.0**	**2.0**
Enhancement Threshold (HU)	**80**	**80**	**80**	**80**	**80**
Diagnostic Delay	**Auto Minimum**	**Auto Minimum**	**Auto Minimum**	**Auto Minimum**	**Auto Minimum**

Series 2, Group 1, Scan Phase

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-60 cm
Scan Type	**Helical**	**Helical**	**Helical**	**Helical**	**Helical**
Beam Collimation	**20**	**20**	**20**	**40**	**40**
Detector Rows	**32.0**	**32.0**	**32.0**	**64.0**	**64.0**
Detector Configuration	**32x0.625**	**32x0.625**	**32x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Small Body**	**Small Body**	**Small Body**	**Large Body**	**Large Body**
Pitch	**1.375**	**1.375**	**1.375**	**1.375**	**1.375**
Speed (mm/rot)	**27.50**	**27.50**	**27.50**	**55.00**	**55.00**
Rotation Time (s)	**0.5**	**0.5**	**0.5**	**1**	**1**
kV	**80**	**80**	**80**	**80**	**100**
AEC type	**smart mA**	**smart mA**	**smart mA**	**smart mA**	**smart mA**
mA Range	**(30-180)**	**(35-220)**	**(60-350)**	**(60-370)**	**(70-470)**
Manual mA	**110.0**	**140.0**	**220.0**	**230.0**	**300.0**
Noise Index	**8.5**	**9.5**	**10.5**	**12.0**	**11.5**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.25**	**2.25**	**2.25**	**2.25**	**2.25**

Series 2, Group 1, Recons

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-60 cm
Recon 1 (Primary)					
DFOV	**20**	**20**	**20**	**25**	**25**
Recon Type	**Detail**	**Detail**	**Detail**	**Detail**	**Detail**
WW/WL	**450/50**	**450/50**	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**	**Plus**	**Plus**
Recon Option					
ASiR/ASiR256/DLIR	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.25**	**2.25**	**2.25**	**2.25**	**2.25**
Recon 2 (Secondary)					
DFOV	**20**	**20**	**20**	**25**	**25**
Recon Type	**Detail**	**Detail**	**Detail**	**Detail**	**Detail**
WW/WL	**450/50**	**450/50**	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**	**0.625**	**0.625**

Series 2, Group 2, Scan Phase

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-60 cm
Scan Type	**Helical**	**Helical**	**Helical**	**Helical**	**Helical**
Beam Collimation	**20**	**20**	**20**	**40**	**40**
Detector Rows	**32.0**	**32.0**	**32.0**	**64.0**	**64.0**
Detector Configuration	**32x0.625**	**32x0.625**	**32x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Small Body**	**Small Body**	**Small Body**	**Large Body**	**Large Body**
Pitch	**1.375**	**1.375**	**1.375**	**1.375**	**1.375**
Speed (mm/rot)	**27.50**	**27.50**	**27.50**	**55.00**	**55.00**
Rotation Time (s)	**0.5**	**0.5**	**0.5**	**0.6**	**0.6**
kV	**80**	**80**	**80**	**80**	**100**
AEC type	**smart mA**	**smart mA**	**smart mA**	**smart mA**	**smart mA**
mA Range	**(15-100)**	**(20-130)**	**(30-200)**	**(60-360)**	**(70-440)**
Manual mA	**60.0**	**80.0**	**130.0**	**220.0**	**280.0**
Noise Index	**11.0**	**12.5**	**14.0**	**16.0**	**15.5**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.25**	**2.25**	**2.25**	**2.25**	**2.25**

Series 2, Group 2, Recons

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-60 cm
Recon 1 (Primary)					
DFOV	**20**	**20**	**20**	**25**	**25**
Recon Type	**Detail**	**Detail**	**Detail**	**Detail**	**Detail**
WW/WL	**450/50**	**450/50**	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**	**Plus**	**Plus**
Recon Option					
ASiR/ASiR256/DLIR	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.25**	**2.25**	**2.25**	**2.25**	**2.25**
Recon 2 (Secondary)					
DFOV	**20**	**20**	**20**	**25**	**25**
Recon Type	**Detail**	**Detail**	**Detail**	**Detail**	**Detail**
WW/WL	**450/50**	**450/50**	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**	**0.625**	**0.625**

Series 2, Group 3, Scan Phase

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-60 cm
Scan Type	**Helical**	**Helical**	**Helical**	**Helical**	**Helical**
Beam Collimation	**20**	**20**	**20**	**40**	**40**
Detector Rows	**32.0**	**32.0**	**32.0**	**64.0**	**64.0**
Detector Configuration	**32x0.625**	**32x0.625**	**32x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Small Body**	**Small Body**	**Small Body**	**Large Body**	**Large Body**
Pitch	**1.375**	**1.375**	**1.375**	**1.375**	**1.375**
Speed (mm/rot)	**27.50**	**27.50**	**27.50**	**55.00**	**55.00**
Rotation Time (s)	**0.5**	**0.5**	**0.5**	**0.6**	**0.6**
kV	**80**	**80**	**80**	**80**	**100**
AEC type	**smart mA**	**smart mA**	**smart mA**	**smart mA**	**smart mA**
mA Range	**(15-100)**	**(20-130)**	**(30-200)**	**(60-360)**	**(70-440)**
Manual mA	**60.0**	**80.0**	**130.0**	**220.0**	**280.0**
Noise Index	**11.0**	**12.5**	**14.0**	**16.0**	**15.5**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.25**	**2.25**	**2.25**	**2.25**	**2.25**

Series 2, Group 3, Recons

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-60 cm
Recon 1 (Primary)					
DFOV	**20**	**20**	**20**	**25**	**25**
Recon Type	**Detail**	**Detail**	**Detail**	**Detail**	**Detail**
WW/WL	**450/50**	**450/50**	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**	**Plus**	**Plus**
Recon Option					
ASiR/ASiR256/DLIR	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.25**	**2.25**	**2.25**	**2.25**	**2.25**
Recon 2 (Secondary)					
DFOV	**20**	**20**	**20**	**25**	**25**
Recon Type	**Detail**	**Detail**	**Detail**	**Detail**	**Detail**
WW/WL	**450/50**	**450/50**	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**	**0.625**	**0.625**

DLIR Limitations:

1. DLIR is not available on the Primary Recon.
2. DLIR is only compatible with the Standard Algorithm. So, in instances where the primary recon is Soft algorithm,(i.e. many Neuro Protocols) the subsequent recons will be in Standard Algorithm to enable DLIR. The slight difference between the Soft and Standard Algorithms is outweighed by the improvement in image quality with DLIR enabled.
3. DLIR requires an interval exactly half of the slice thickness.
4. DLIR doesn't allow an interval of 0.312 mm. So, if you are on a DLIR enabled scanner, the thin 0.625 recon will be at 0.625x0.625 mm. On all other scanners the thin recon will be at 0.625x0.312 mm.

Trauma Abd/Pelvis 16.1.4/16.2.4/16.4.4/16.6.4/16.8.4

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Indication

blunt or penetrating trauma

Video for this protocol

Oral Contrast

None

Pre-Scan Instructions

- Clamp Foley catheter prior to exam. Make sure to place Foley below the level of the bladder.
- Image with arms up if possible.
- To properly select a pediatric protocol size:
  - First use the patient's age to select scout parameters
  - After acquiring the scout, measure the PA + Lateral widths
  - Scan using the protocol corresponding to the sum of the AP+Lateral measurements (you may need to select a protocol that does not match the patient's age)

Color Grouping	Pink	Red/Purple	Yellow/White	Blue/Orange	Green/Black
Age	Newborn	6 mo - 2.5 yr	3-7 yr	8-12 yr	13-18 yr
PA + Lat (cm)	0-26	27-31	32-37	38-43	44-55

- If the patient is bigger than 60 cm scan in a Medium Adult protocol and perform the adult reformats.

IV Contrast Parameters 350

Weight Ranges	Contrast Dosage	Injection Rate
<34 kg (<75 lbs)	1.7 mL/kg Iohexol 350 mgI/mL + 30 mL NaCl flush	1.5 - 3 mL/sec
35-58 kg (75-129 lbs)	69 mL Iohexol 350 mgI/mL + 30 mL NaCl flush	1.5 - 3 mL/sec
>59 kg (>130 lbs)	Patients above 46 kg use the "Use Medrad P3T or UW-ConCal Routine Peds Calculator Protocol" with Iohexol 350mgI/mL + 30mL NaCl flush.	1.5 - 3 mL/sec
Injection Rate variable, depending on the size of patient and IV guage.		

For sites without the Ulrich use Medrad p3T or refer to the weight based contrast tables included with the protocol booklet.

IV Contrast Parameters 300/370

Weight Ranges	Contrast Dosage	Injection Rate
<40 kg (<100 lbs)	2 mL/kg Iohexol 300 mgI/mL + 30 mL NaCl flush	1.5 - 3 mL/sec
45-65 kg (100-140 lbs)	80 mL Iohexol 300 mgI/mL + 30 mL NaCl flush	1.5 - 3 mL/sec
>65 kg (>140 lbs)	Patients above 65 kg use the Medrad™ P3T for volume of Iohexol 300mgI/mL + 30mL NaCl flush.	1.5 - 3 mL/sec
Injection Rate variable, depending on the size of patient and IV guage.		

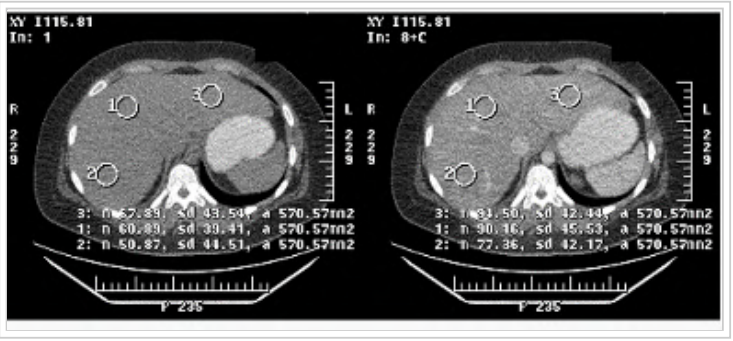
For sites without the Medrad™ P3T or P3T PA option, refer to the weight based contrast tables we provide in the protocol booklet.

Field of View

As small as possible

Scan Description

- **Series 1** – PA & Lateral Scout: from diaphragm through pubic symphysis
- **Series 2** – Scan Phase: Start scan just above the top of the diaphragm and end just below the pubic symphysis.
  - Smart Prep – Monitor Phase: Center over the liver. Place 3 ROIs in the liver. If enhancement threshold is not reach by 70 seconds, start the scan.



- **Series 3** - Delayed (Optional per MD) 5 - 7 minute delayed scans only in area of interest

Reformat Instructions

Use DMPR on recon 2 (thins) and (if spines are ordered) Manual on recon 3 and 5

Reformats

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
SA PEDS	Thin ST	DMPR	Average	450/50	4	2	sagittal
CO PEDS	Thin ST	DMPR	Average	450/50	4	2	coronal
SA ST	Thin ST	Manual (if spines are ordered)	Average	450/50	2	1	sagittal
CO ST	Thin ST	Manual (if spines are ordered)	Average	450/50	2	1	coronal
SA BONE	Thin Bone	Manual (if spines are ordered)	Average	2500/350	2	1	sagittal
CO BONE	Thin Bone	Manual (if spines are ordered)	Average	2500/350	2	1	coronal

Networking

- All Images to PACS (ALI_Store).
- Note: if smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

Miscellaneous

None

Acquisition Parameters

Series 1, Scout

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-60 cm
Scout 1 kV	**80**	**80**	**80**	**80**	**100**
Scout 1 mA	**10**	**10**	**10**	**10**	**10**
Scout 1 Angle	**180**	**180**	**180**	**180**	**180**
Scout 2 kV	**80**	**80**	**80**	**80**	**100**
Scout 2 mA	**40**	**40**	**40**	**40**	**40**
Scout 2 Angle	**90**	**90**	**90**	**90**	**90**
WW/WL for Scout	**500/50**	**500/50**	**500/50**	**500/50**	**500/50**

Series 2, Smart Prep

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-60 cm
mA	**20**	**40**	**40**	**40**	**40**
Monitoring Delay (sec)	**20.0**	**20.0**	**25.0**	**25.0**	**30.0**
Monitoring ISD (sec)	**2.0**	**2.0**	**2.0**	**2.0**	**2.0**
Enhancement Threshold (HU)	**50**	**50**	**50**	**50**	**50**
Diagnostic Delay	**Auto Minimum**	**Auto Minimum**	**Auto Minimum**	**Auto Minimum**	**Auto Minimum**

Series 2, Scan Phase

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-60 cm
Scan Type	**Helical**	**Helical**	**Helical**	**Helical**	**Helical**
Beam Collimation	**20**	**20**	**20**	**40**	**40**
Detector Rows	**32.0**	**32.0**	**32.0**	**64.0**	**64.0**
Detector Configuration	**32x0.625**	**32x0.625**	**32x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Small Body**	**Small Body**	**Small Body**	**Large Body**	**Large Body**
Pitch	**1.375**	**1.375**	**1.375**	**1.375**	**1.375**
Speed (mm/rot)	**27.50**	**27.50**	**27.50**	**55.00**	**55.00**
Rotation Time (s)	**0.5**	**0.5**	**0.5**	**1**	**1**
kV	**80**	**80**	**80**	**80**	**100**
AEC type	**smart mA**	**smart mA**	**smart mA**	**smart mA**	**smart mA**
mA Range	**(30-180)**	**(35-220)**	**(60-350)**	**(60-370)**	**(70-470)**
Manual mA	**110.0**	**140.0**	**220.0**	**230.0**	**300.0**
Noise Index	**8.5**	**9.5**	**10.5**	**12.0**	**11.5**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.25**	**2.25**	**2.25**	**2.25**	**2.25**

Series 2, Recons

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-60 cm
Recon 1 (Primary)					
DFOV	20	20	20	25	25
Recon Type	Detail	Detail	Detail	Detail	Detail
WW/WL	450/50	450/50	450/50	450/50	450/50
Recon Option	Plus	Plus	Plus	Plus	Plus
Recon Option					
ASiR/ASiR256/DLIR	40% / 20% / Medium	40% / 20% / Medium	40% / 20% / Medium	40% / 20% / Medium	40% / 20% / Medium
Slice Thickness (mm)	3.75	3.75	3.75	3.75	3.75
Interval (mm)	2.25	2.25	2.25	2.25	2.25
Recon 2 (Secondary)					
DFOV	20	20	20	25	25
Recon Type	Detail	Detail	Detail	Detail	Detail
WW/WL	450/50	450/50	450/50	450/50	450/50
Recon Option	Plus	Plus	Plus	Plus	Plus
Recon Option	IQ Enhance	IQ Enhance	IQ Enhance	IQ Enhance	IQ Enhance
ASiR/ASiR256/DLIR	40% / 20% / Medium	40% / 20% / Medium	40% / 20% / Medium	40% / 20% / Medium	40% / 20% / Medium
Slice Thickness (mm)	1.25	1.25	1.25	1.25	1.25
Interval (mm)	0.625	0.625	0.625	0.625	0.625
Recon 3 (Secondary)					
DFOV	16	16	16	16	16
Recon Type	Soft	Soft	Soft	Soft	Soft
WW/WL	450/50	450/50	450/50	450/50	450/50
Recon Option	Plus	Plus	Plus	Plus	Plus
Recon Option	IQ Enhance	IQ Enhance	IQ Enhance	IQ Enhance	IQ Enhance
ASiR/ASiR256/DLIR	60% / 30% / High	60% / 30% / High	60% / 30% / High	60% / 30% / High	60% / 30% / High
Slice Thickness (mm)	1.25	1.25	1.25	1.25	1.25
Interval (mm)	0.625	0.625	0.625	0.625	0.625
Recon 4 (Secondary)					
DFOV	16	16	16	16	16
Recon Type	Bone Plus	Bone Plus	Bone Plus	Bone Plus	Bone Plus
WW/WL	2500/350	2500/350	2500/350	2500/350	2500/350
Recon Option	Plus	Plus	Plus	Plus	Plus
Recon Option	IQ Enhance	IQ Enhance	IQ Enhance	IQ Enhance	IQ Enhance
ASiR/ASiR256/DLIR	None	None	None	None	None
Slice Thickness (mm)	1.25	1.25	1.25	1.25	1.25
Interval (mm)	0.625	0.625	0.625	0.625	0.625
Recon 5 (Secondary)					
DFOV	16	16	16	16	16
Recon Type	Bone Plus	Bone Plus	Bone Plus	Bone Plus	Bone Plus
WW/WL	2500/350	2500/350	2500/350	2500/350	2500/350
Recon Option	Plus	Plus	Plus	Plus	Plus
Recon Option	IQ Enhance	IQ Enhance	IQ Enhance	IQ Enhance	IQ Enhance
ASiR/ASiR256/DLIR	None	None	None	None	None
Slice Thickness (mm)	0.625	0.625	0.625	0.625	0.625
Interval (mm)	0.312	0.312	0.312	0.312	0.312

16 & 32 Slice Scanner Exceptions:

1. The 0.625mm slice thickness x 0.312mm interval Recon should be 1.25mm slice thickness x 0.625mm interval on 16 and 32 slice CT scanners. The 16 and 32 slice scanners are only able to recon down to 0.625mm slice thickness when using 10mm and/or 20mm beam collimation respectively. However, when using 20mm and/or 40mm beam collimation, they are only capable of reconstructing to 1.25mm slice thickness.
2. MARS feature is not an option.

3. IQ Enhance feature requires thin slices (1.25mm or less) with an interval of half (or less). On older scanner models, in order to enable IQ Enhance at 0.625 mm slice thickness, the interval must be set to 0.311 mm instead of 0.312 mm.

DLIR Limitations:

1. DLIR is not available on the Primary Recon.
2. DLIR is only compatible with the Standard Algorithm. So, in instances where the primary recon is Soft algorithm,(i.e. many Neuro Protocols) the subsequent recons will be in Standard Algorithm to enable DLIR. The slight difference between the Soft and Standard Algorithms is outweighed by the improvement in image quality with DLIR enabled.
3. DLIR requires an interval exactly half of the slice thickness.
4. DLIR doesn't allow an interval of 0.312 mm. So, if you are on a DLIR enabled scanner, the thin 0.625 recon will be at 0.625x0.625 mm. On all other scanners the thin recon will be at 0.625x0.312 mm.

Series 3, Scan Phase

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-60 cm
Scan Type	**Helical**	**Helical**	**Helical**	**Helical**	**Helical**
Beam Collimation	**20**	**20**	**20**	**40**	**40**
Detector Rows	**32.0**	**32.0**	**32.0**	**64.0**	**64.0**
Detector Configuration	**32x0.625**	**32x0.625**	**32x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Small Body**	**Small Body**	**Small Body**	**Large Body**	**Large Body**
Pitch	**1.375**	**1.375**	**1.375**	**1.375**	**1.375**
Speed (mm/rot)	**27.50**	**27.50**	**27.50**	**55.00**	**55.00**
Rotation Time (s)	**0.5**	**0.5**	**0.5**	**0.6**	**0.6**
kV	**80**	**80**	**80**	**80**	**100**
AEC type	**smart mA**	**smart mA**	**smart mA**	**smart mA**	**smart mA**
mA Range	**(15-100)**	**(20-130)**	**(30-200)**	**(60-360)**	**(70-440)**
Manual mA	**60.0**	**80.0**	**130.0**	**220.0**	**280.0**
Noise Index	**11.0**	**12.5**	**14.0**	**16.0**	**15.5**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.25**	**2.25**	**2.25**	**2.25**	**2.25**

Series 3, Recons

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-60 cm
Recon 1 (Primary)					
DFOV	**20**	**20**	**20**	**25**	**25**
Recon Type	**Detail**	**Detail**	**Detail**	**Detail**	**Detail**
WW/WL	**450/50**	**450/50**	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**	**Plus**	**Plus**
Recon Option					
ASiR/ASiR256/DLIR	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.25**	**2.25**	**2.25**	**2.25**	**2.25**
Recon 2 (Secondary)					
DFOV	**20**	**20**	**20**	**25**	**25**
Recon Type	**Detail**	**Detail**	**Detail**	**Detail**	**Detail**
WW/WL	**450/50**	**450/50**	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**	**0.625**	**0.625**

Pediatric Neck/Chest/Abd/Pelvis

Pediatric patients between the age of 18-20 yrs: to be scanned C/A/P in one scan. Do not scan using two groups.

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Indication

Chest with contrast: Initial evaluations for metastatic disease. Chest without contrast: Follow-up osteosarcoma mets

C/A/P: Neoplasm, fever of unknown origin, infection. Metastatic disease workup/follow-up.

Neck: mass, globus sensation, lymphadenopathy, head and neck cancer evaluation/follow-up, pharyngitis, tonsillar or peritonsillar abscess, neck abscess

Oral Contrast

These are target volumes for oral contrast. If the child is vomiting or otherwise unable to tolerate the total amount, it can obviously be decreased. For optimal interpretation of these scans, encourage the above amounts.

Hydrate ER patient if time allows

Mix 4mL Iohexol 300 (Omnipaque) in 200mL of a clear liquid.

Age	Weight (lbs)	Total Oral Contrast Quantity
0 - 1	10 - 25	100 mLs
1 - 3	20 - 40	200 mLs
3 - 5	30 - 60	400 mLs
5 - 10	40 - 90	600 mLs
11+	over 90	800 mLs +

Pre-Scan Instructions

CAP portion

- To properly select a pediatric protocol size:
  - First use the patient's age to select scout parameters
  - After acquiring the scout, measure the PA + Lateral widths
  - Scan using the protocol corresponding to the sum of the AP+Lateral measurements (you may need to select a protocol that does not match the patient's age)

Color Grouping	Pink	Red/Purple	Yellow/White	Blue/Orange	Green/Black
Age	Newborn	6 mo - 2.5 yr	3-7 yr	8-12 yr	13-18 yr
PA + Lat (cm)	0-26	27-31	32-37	38-43	44-60

- If the patient is bigger than 60 cm scan in a Medium Adult protocol and perform the adult reformats. If the patient requires an adult medium or large protocol, please delete the abd/pel group and extend the chest through the pelvis, **scan in one group**, **not two**.

Neck portion

- Patient supine, PA and lateral scouts from sella to mid chest (include the aortic arch), no gantry angle

- Have the patient remove any dentures or removable teeth, please place the shoulders as low possible
- Positioning: Tilt the patient's head so that a line connecting the lateral canthus of the eye and the EAC is perpendicular to the CT tabletop (see head CT protocol).
- Remove all metallic and high-density objects from the scanning area.
- If the indication is for neck mass, especially for first time scans, please have patient place a BB on the palpable mass.
- Right sided IV is always preferred (not required) for imaging of the neck due to contrast reflux into the brachiocephalic veins.
- Perform angled views if there are artifacts from dental fillings or metal hardware. Check with Radiologist before performing angled views on Pediatric patients, we rarely do these (see below)

IV Contrast Parameters

When scanning a pediatric Neck + C/A/P -OR- Neck + Chest with contrast (based on patient's weight)

1. Use the weight conversion tables provided below to get the TOTAL contrast volume needed for both exams

Weight Range	Contrast Volume
0 - 80 kg (0-175lbs)	1.3 mL/kg or (.6 mL/lb) Iohexol 350
Over 80kg (>176 lbs)	Use adult dosage

Weight Range	Contrast Volume
0 - 80 kg (0-175lbs)	1.5 mL/kg or (.7mL/lb) Iohexol 300
Over 80kg (>176 lbs)	Use adult dosage

2. Use the table below to determine how much contrast to inject for exam.

Scan Combination	Contrast Dosage	Injection Rate
C/A/P + Neck Combo split the total contrast into thirds.		
C/A/P	Use 2/3 total volume Iohexol 300 mgI/mL + 30 mL NaCl flush	1.5 - 3 mL/s
Neck	Use remaining 1/3 total volume Iohexol 300 mgI/mL + 20 mL NaCl flush	2 mL/s
Change the Prep Delay to 20 seconds (from 45 seconds) on the Neck protocol.		
Chest + Neck Combo split the total contrast in half.		
Chest	Use 1/2 total volume Iohexol 300 mgI/mL + 30 mL NaCl flush	1.5 - 3 mL/s
Neck	Use remaining 1/2 total volume Iohexol 300 mgI/mL + 20 mL NaCl flush	2 mL/s
Change the Prep Delay to 20 seconds (from 45 seconds) on the Neck protocol.		

Field of View

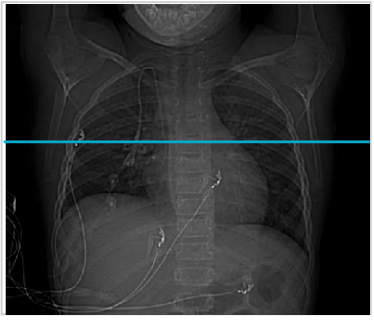
Same as previous study or as small as appropriate

Scan Description

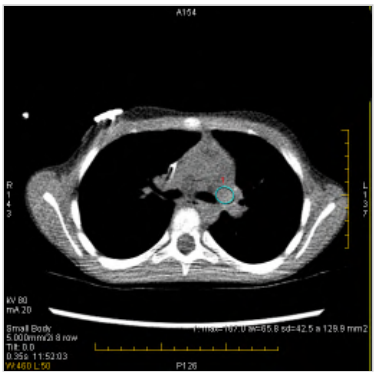
Chest only

- **Series 1** – PA & Lateral Scout: from base of neck through lung bases with inspiration

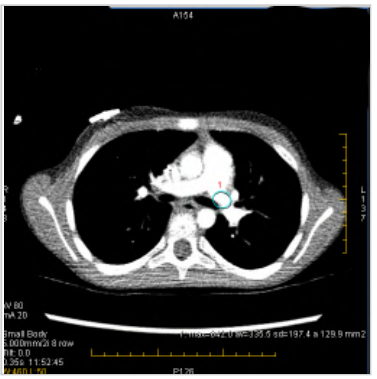
- **Series 2** - Helical: Scan from just above the lung apices and extend through lung bases with full inspiration.
- Smart prep: Place ROI on the pulmonary artery. Once it reaches the proper threshold, hit scan phase. The scan will then have a 12 second diagnostic delay built in. If enhancement threshold is not reach by 50 seconds, start the scan.



Scout



ROI Location

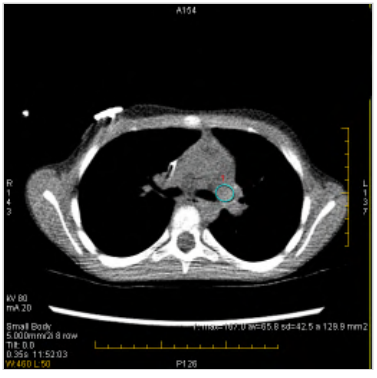


ROI Location

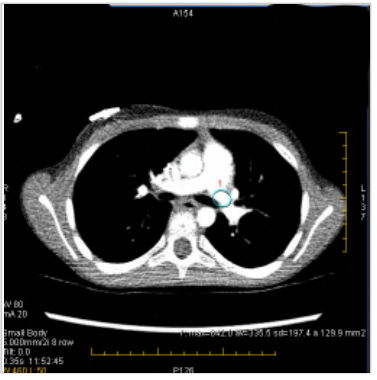
C/A/P

- **Series 1** – PA & Lateral Scout: from base of neck through pubic symphysis
- **Series 2** - Helical Phase: Scan Chest/ Abdomen/Pelvis in portal venous phase. Start scan just above the lung apices. For a Chest/Abdomen, end at the iliac crests and for a full CAP end at the pubic symphysis. **If the patient requires an adult medium or large protocol, please delete the abd/pel group and extend the chest through the pelvis, scan in one group, not two**. You may want to turn off your DMPR's and manually preform the reformats.
    - Smart prep: Center over the pulmonary artery. There is a built in diagnostic delay of 20 seconds after the smart prep enhancement threshold is reached.

Scout



ROI Location



ROI Location

Neck

- Series 1 – Scouts PA and Lateral: from the top of the orbit to the carina.
- Series 2 – Neck with Contrast: Begin Scanning **20 seconds** after the start of injection: Start the scan at the top of the orbit and scan to the carina. Remind the patient not to swallow during the scan.

Please remember to change the prep group delay in the neck protocol to 20 seconds

Reformat Instructions

Use DMPR on THIN ST.

Reformats

C/CAP

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
PEDS SA CHEST	THIN LUNG	Manual	Average	1500/-700	4	2	sagittal
PEDS CO CHEST	THIN LUNG	Manual	Average	1500/-700	4	2	coronal
SA PEDS	Thin ST	DMPR	Average	450/50	4	2	sagittal
CO PEDS	Thin ST	DMPR	Average	450/50	4	2	coronal
AX MIPS	THIN ST	Manual	MIP	1500/-700	10	5	Axial

Neck

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
CO ST	Thin ST	Manual	Average	400/60	3	1.5	Coronal
CO BONE	Thin Bone	Manual	Average	2500/350	1.5	0.75	Coronal
SA ST	Thin ST	Manual	Average	400/60	3	1.5	Sagittal
SA BONE	Thin Bone	Manual	Average	2500/350	1.5	0.75	Sagittal

Networking

- All Images to PACS (ALI_Store).
- Note: if smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

Miscellaneous

None

Acquisition Parameters

Use routine (or high image quality if you desire) pediatric CAP protocol followed by the routine pediatric Neck Protocol.

Chest - Standard (Routine and High-Resolution) (Higher Image Quality) 15.1.8/15.2.8/15.4.8/15.6.8/15.8.8

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Clinical Instructions for this protocol are identical to Chest - Standard (Routine and High-Resolution) 15.1.1/15.2.1/15.4.1/15.6.1/15.8.1

Acquisition Parameters

Series 1, Scout

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-60 cm
Scout 1 kV	**80**	**80**	**80**	**80**	**100**
Scout 1 mA	**10**	**10**	**10**	**10**	**10**
Scout 1 Angle	**180**	**180**	**180**	**180**	**180**
Scout 2 kV	**80**	**80**	**80**	**80**	**100**
Scout 2 mA	**40**	**40**	**40**	**40**	**40**
Scout 2 Angle	**90**	**90**	**90**	**90**	**90**
WW/WL for Scout	**500/50**	**500/50**	**500/50**	**500/50**	**500/50**

Series 2, Smart Prep

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-60 cm
mA	**20**	**40**	**40**	**40**	**40**
Monitoring Delay (sec)	**20.0**	**20.0**	**20.0**	**20.0**	**20.0**
Monitoring ISD (sec)	**2.0**	**2.0**	**2.0**	**2.0**	**2.0**
Enhancement Threshold (HU)	**50**	**50**	**50**	**50**	**50**
Diagnostic Delay	**12**	**12**	**12**	**12**	**12**

Series 2, Scan Phase

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-60 cm
Scan Type	**Helical**	**Helical**	**Helical**	**Helical**	**Helical**
Beam Collimation	**40**	**40**	**40**	**40**	**40**
Detector Rows	**64.0**	**64.0**	**64.0**	**64.0**	**64.0**
Detector Configuration	**64x0.625**	**64x0.625**	**64x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Small Body**	**Small Body**	**Small Body**	**Large Body**	**Large Body**
Pitch	**1.375**	**1.375**	**1.375**	**1.375**	**1.375**
Speed (mm/rot)	**55.00**	**55.00**	**55.00**	**55.00**	**55.00**
Rotation Time (s)	**0.5**	**0.5**	**0.5**	**0.6**	**0.7**
kV	**80**	**80**	**80**	**80**	**100**
AEC type	**smart mA**	**smart mA**	**smart mA**	**smart mA**	**smart mA**
mA Range	**(20-110)**	**(20-140)**	**(35-220)**	**(60-390)**	**(70-420)**
Manual mA	**70.0**	**90.0**	**140.0**	**240.0**	**270.0**
Noise Index	**10.5**	**12.0**	**13.5**	**15.0**	**15.0**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.25**	**2.25**	**2.25**	**2.25**	**2.25**

Series 2, Recons

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-60 cm
Recon 1 (Primary)					
DFOV	**20**	**20**	**20**	**25**	**25**
Recon Type	**Detail**	**Detail**	**Detail**	**Detail**	**Detail**
WW/WL	**450/50**	**450/50**	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**	**Plus**	**Plus**
Recon Option					
ASiR/ASiR256/DLIR	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.25**	**2.25**	**2.25**	**2.25**	**2.25**
Recon 2 (Secondary)					
DFOV	**20**	**20**	**20**	**25**	**25**
Recon Type	**Detail**	**Detail**	**Detail**	**Detail**	**Detail**
WW/WL	**450/50**	**450/50**	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**	**0.625**	**0.625**
Recon 3 (Secondary)					
DFOV	**20**	**20**	**20**	**25**	**25**
Recon Type	**BonePlus**	**BonePlus**	**BonePlus**	**Bone Plus**	**Bone Plus**
WW/WL	**1500/-700**	**1500/-700**	**1500/-700**	**1500/-700**	**1500/-700**
Recon Option	**Plus**	**Plus**	**Plus**	**Plus**	**Plus**
Recon Option					
ASiR/ASiR256/DLIR	**None**	**None**	**None**	**None**	**None**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.25**	**2.25**	**2.25**	**2.25**	**2.25**
Recon 4 (Secondary)					
DFOV	**20**	**20**	**20**	**25**	**25**
Recon Type	**BonePlus**	**BonePlus**	**BonePlus**	**Bone Plus**	**Bone Plus**
WW/WL	**1500/-700**	**1500/-700**	**1500/-700**	**1500/-700**	**1500/-700**
Recon Option	**Plus**	**Plus**	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**	**None**	**None**	**None**	**None**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**	**0.625**	**0.625**

Series 3, Scout

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-60 cm
Scout 1 kV	**80**	**80**	**80**	**80**	**100**
Scout 1 mA	**10**	**10**	**10**	**10**	**10**
Scout 1 Angle	**180**	**180**	**180**	**180**	**180**
Scout 2 kV	**80**	**80**	**80**	**80**	**100**
Scout 2 mA	**40**	**40**	**40**	**40**	**40**
Scout 2 Angle	**90**	**90**	**90**	**90**	**90**
WW/WL for Scout	**500/50**	**500/50**	**500/50**	**500/50**	**500/50**

Series 4, Scan Phase

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-60 cm
Scan Type	**Axial**	**Axial**	**Axial**	**Axial**	**Axial**
Beam Collimation	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**
Detector Rows	**2.0**	**2.0**	**2.0**	**2.0**	**2.0**
Detector Configuration	**2x0.625**	**2x0.625**	**2x0.625**	**2x0.625**	**2x0.625**
Scan FOV	**Small Body**	**Small Body**	**Small Body**	**Large Body**	**Large Body**
Pitch	**1**	**1**	**1**	**1**	**1**
Speed (mm/rot)	**1.30**	**1.30**	**1.30**	**1.30**	**1.30**
Rotation Time (s)	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**
kV	**80**	**80**	**80**	**80**	**100**
AEC type	**smart mA**	**smart mA**	**smart mA**	**smart mA**	**smart mA**
mA Range	**(10-50)**	**(10-70)**	**(15-110)**	**(35-230)**	**(45-280)**
Manual mA	**30.0**	**40.0**	**70.0**	**140.0**	**180.0**
Noise Index	**22.0**	**25.5**	**28.5**	**32.5**	**31.5**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**
Interval (mm)	**10**	**10**	**10**	**10**	**10**

Series 4, Recons

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-60 cm
Recon 1 (Primary)					
DFOV	**20**	**20**	**20**	**20**	**20**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**1500/-700**	**1500/-700**	**1500/-700**	**1500/-700**	**1500/-700**
Recon Option	**Full**	**Full**	**Full**	**Full**	**Full**
Recon Option					
ASiR/ASiR256/DLIR	**None**	**None**	**None**	**None**	**None**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**
Interval (mm)	**10**	**10**	**10**	**10**	**10**

Chest Pectus (Higher Image Quality) 15.1.10/15.2.10/15.4.10/15.6.10/15.8.10

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Clinical Instructions for this protocol are identical to Chest Pectus 15.1.3/15.2.3/15.4.3/15.6.3/15.8.3

Acquisition Parameters

Series 1, Scout

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-60 cm
Scout 1 kV	**80**	**80**	**80**	**80**	**100**
Scout 1 mA	**10**	**10**	**10**	**10**	**10**
Scout 1 Angle	**180**	**180**	**180**	**180**	**180**
Scout 2 kV	**80**	**80**	**80**	**80**	**100**
Scout 2 mA	**40**	**40**	**40**	**40**	**40**
Scout 2 Angle	**90**	**90**	**90**	**90**	**90**
WW/WL for Scout	**500/50**	**500/50**	**500/50**	**500/50**	**500/50**

Series 2, Scan Phase

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-60 cm
Scan Type	**Helical**	**Helical**	**Helical**	**Helical**	**Helical**
Beam Collimation	**20**	**20**	**20**	**40**	**40**
Detector Rows	**32.0**	**32.0**	**32.0**	**64.0**	**64.0**
Detector Configuration	**32x0.625**	**32x0.625**	**32x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Small Body**	**Small Body**	**Small Body**	**Large Body**	**Large Body**
Pitch	**1.375**	**1.375**	**1.375**	**1.375**	**1.375**
Speed (mm/rot)	**27.50**	**27.50**	**27.50**	**55.00**	**55.00**
Rotation Time (s)	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**
kV	**80**	**80**	**80**	**80**	**100**
AEC type	**smart mA**	**smart mA**	**smart mA**	**smart mA**	**smart mA**
mA Range	**(10-80)**	**(15-100)**	**(25-150)**	**(50-330)**	**(70-410)**
Manual mA	**50.0**	**60.0**	**100.0**	**200.0**	**260.0**
Noise Index	**12.5**	**14.5**	**16.0**	**18.5**	**17.5**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.25**	**2.25**	**2.25**	**2.25**	**2.25**

Series 2, Recons

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-60 cm
Recon 1 (Primary)					
DFOV	**20**	**20**	**20**	**25**	**25**
Recon Type	**Detail**	**Detail**	**Detail**	**Detail**	**Detail**
WW/WL	**450/50**	**450/50**	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**	**Plus**	**Plus**
Recon Option					
ASiR/ASiR256/DLIR	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.25**	**2.25**	**2.25**	**2.25**	**2.25**
Recon 2 (Secondary)					
DFOV	**20**	**20**	**20**	**25**	**25**
Recon Type	**Detail**	**Detail**	**Detail**	**Detail**	**Detail**
WW/WL	**450/50**	**450/50**	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**	**0.625**	**0.625**
Recon 3 (Secondary)					
DFOV	**20**	**20**	**20**	**25**	**25**
Recon Type	**BonePlus**	**BonePlus**	**BonePlus**	**Bone Plus**	**Bone Plus**
WW/WL	**1500/-700**	**1500/-700**	**1500/-700**	**1500/-700**	**1900/-475**
Recon Option	**Plus**	**Plus**	**Plus**	**Plus**	**Plus**
Recon Option					
ASiR/ASiR256/DLIR	**None**	**None**	**None**	**None**	**None**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.25**	**2.25**	**2.25**	**2.25**	**2.25**
Recon 4 (Secondary)					
DFOV	**20**	**20**	**20**	**25**	**25**
Recon Type	**BonePlus**	**BonePlus**	**BonePlus**	**Bone Plus**	**Bone Plus**
WW/WL	**1500/-700**	**1500/-700**	**1500/-700**	**1500/-700**	**1500/-700**
Recon Option	**Plus**	**Plus**	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**	**None**	**None**	**None**	**None**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**	**0.625**	**0.625**

Chest CTPA for PE (Higher Image Quality) 15.1.11/15.2.11/15.4.11/15.6.11/15.8.11

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Clinical Instructions for this protocol are identical to Chest CTPA for PE 15.1.4/15.2.4/15.4.4/15.6.4/15.8.4

Acquisition Parameters

Series 1, Scout

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-60 cm
Scout 1 kV	**80**	**80**	**80**	**80**	**100**
Scout 1 mA	**10**	**10**	**10**	**10**	**10**
Scout 1 Angle	**180**	**180**	**180**	**180**	**180**
Scout 2 kV	**80**	**80**	**80**	**80**	**100**
Scout 2 mA	**40**	**40**	**40**	**40**	**40**
Scout 2 Angle	**90**	**90**	**90**	**90**	**90**
WW/WL for Scout	**500/50**	**500/50**	**500/50**	**500/50**	**500/50**

Series 2, Smart Prep

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-60 cm
mA	**20**	**40**	**40**	**40**	**40**
Monitoring Delay (sec)	**10.0**	**10.0**	**10.0**	**10.0**	**10.0**
Monitoring ISD (sec)	**1.0**	**1.0**	**1.0**	**1.0**	**1.0**
Enhancement Threshold (HU)	**50**	**50**	**50**	**50**	**50**
Diagnostic Delay	**Auto Minimum**	**Auto Minimum**	**Auto Minimum**	**Auto Minimum**	**Auto Minimum**

Series 2, Scan Phase

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-60 cm
Scan Type	**Helical**	**Helical**	**Helical**	**Helical**	**Helical**
Beam Collimation	**40**	**40**	**40**	**40**	**40**
Detector Rows	**64.0**	**64.0**	**64.0**	**64.0**	**64.0**
Detector Configuration	**64x0.625**	**64x0.625**	**64x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Small Body**	**Small Body**	**Small Body**	**Large Body**	**Large Body**
Pitch	**1.375**	**1.375**	**1.375**	**1.375**	**1.375**
Speed (mm/rot)	**55.00**	**55.00**	**55.00**	**55.00**	**55.00**
Rotation Time (s)	**0.5**	**0.5**	**0.5**	**0.6**	**0.7**
kV	**80**	**80**	**80**	**80**	**100**
AEC type	**smart mA**	**smart mA**	**smart mA**	**smart mA**	**smart mA**
mA Range	**(20-110)**	**(20-140)**	**(35-220)**	**(60-390)**	**(70-420)**
Manual mA	**70.0**	**90.0**	**140.0**	**240.0**	**270.0**
Noise Index	**18.0**	**20.5**	**23.0**	**26.5**	**25.5**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**	**0.625**	**0.625**

Series 2, Recons

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-60 cm
Recon 1 (Primary)					
DFOV	**20**	**20**	**20**	**25**	**25**
Recon Type	**Detail**	**Detail**	**Detail**	**Detail**	**Detail**
WW/WL	**450/50**	**450/50**	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**	**0.625**	**0.625**
Recon 2 (Secondary)					
DFOV	**20**	**20**	**20**	**25**	**25**
Recon Type	**BonePlus**	**BonePlus**	**BonePlus**	**Bone Plus**	**Bone Plus**
WW/WL	**1500/-700**	**1500/-700**	**1500/-700**	**1500/-700**	**1500/-700**
Recon Option	**Plus**	**Plus**	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**	**None**	**None**	**None**	**None**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**	**0.625**	**0.625**

Routine Chest/Abd/Pelvis (Higher Image Quality) 15.1.12/15.2.12/15.4.12/15.6.12/15.8.12

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Clinical Instructions for this protocol are identical to Routine Chest/Abd/Pelvis 15.1.5/15.2.5/15.4.5/15.6.5/15.8.5

Acquisition Parameters

Series 1, Scout

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-60 cm
Scout 1 kV	**80**	**80**	**80**	**80**	**100**
Scout 1 mA	**10**	**10**	**10**	**10**	**10**
Scout 1 Angle	**180**	**180**	**180**	**180**	**180**
Scout 2 kV	**80**	**80**	**80**	**80**	**100**
Scout 2 mA	**40**	**40**	**40**	**40**	**40**
Scout 2 Angle	**90**	**90**	**90**	**90**	**90**
WW/WL for Scout	**500/50**	**500/50**	**500/50**	**500/50**	**500/50**

Series 2, Smart Prep

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-60 cm
mA	**20**	**40**	**40**	**40**	**40**
Monitoring Delay (sec)	**20.0**	**20.0**	**20.0**	**20.0**	**20.0**
Monitoring ISD (sec)	**2.0**	**2.0**	**2.0**	**2.0**	**2.0**
Enhancement Threshold (HU)	**30**	**30**	**30**	**30**	**30**
Diagnostic Delay	**20**	**20**	**20**	**20**	**20**

Series 2, Scan Phase

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-60 cm
Scan Type	**Helical**	**Helical**	**Helical**	**Helical**	**Helical**
Beam Collimation	**20**	**20**	**20**	**40**	**40**
Detector Rows	**32.0**	**32.0**	**32.0**	**64.0**	**64.0**
Detector Configuration	**32x0.625**	**32x0.625**	**32x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Small Body**	**Small Body**	**Small Body**	**Large Body**	**Large Body**
Pitch	**1.375**	**1.375**	**1.375**	**1.375**	**1.375**
Speed (mm/rot)	**27.50**	**27.50**	**27.50**	**55.00**	**55.00**
Rotation Time (s)	**0.5**	**0.5**	**0.5**	**0.8**	**0.9**
kV	**80**	**80**	**80**	**80**	**100**
AEC type	**smart mA**	**smart mA**	**smart mA**	**smart mA**	**smart mA**
mA Range	**(25-150)**	**(30-190)**	**(50-300)**	**(60-400)**	**(70-440)**
Manual mA	**100.0**	**120.0**	**190.0**	**250.0**	**280.0**
Noise Index	**9.0**	**10.0**	**11.5**	**13.0**	**12.5**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.25**	**2.25**	**2.25**	**2.25**	**2.25**

Series 2, Recons

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-60 cm
Recon 1 (Primary)					
DFOV	20	20	20	25	25
Recon Type	Detail	Detail	Detail	Detail	Detail
WW/WL	450/50	450/50	450/50	450/50	450/50
Recon Option	Plus	Plus	Plus	Plus	Plus
Recon Option					
ASiR/ASiR256/DLIR	40% / 20% / Medium	40% / 20% / Medium	40% / 20% / Medium	40% / 20% / Medium	40% / 20% / Medium
Slice Thickness (mm)	3.75	3.75	3.75	3.75	3.75
Interval (mm)	2.25	2.25	2.25	2.25	2.25
Recon 2 (Secondary)					
DFOV	20	20	20	25	25
Recon Type	Detail	Detail	Detail	Detail	Detail
WW/WL	450/50	450/50	450/50	450/50	450/50
Recon Option	Plus	Plus	Plus	Plus	Plus
Recon Option	IQ Enhance	IQ Enhance	IQ Enhance	IQ Enhance	IQ Enhance
ASiR/ASiR256/DLIR	40% / 20% / Medium	40% / 20% / Medium	40% / 20% / Medium	40% / 20% / Medium	40% / 20% / Medium
Slice Thickness (mm)	1.25	1.25	1.25	1.25	1.25
Interval (mm)	0.625	0.625	0.625	0.625	0.625
Recon 3 (Secondary)					
DFOV	20	20	20	25	25
Recon Type	BonePlus	BonePlus	BonePlus	Bone Plus	Bone Plus
WW/WL	1500/-700	1500/-700	1500/-700	1500/-700	1900/-475
Recon Option	Plus	Plus	Plus	Plus	Plus
Recon Option					
ASiR/ASiR256/DLIR	None	None	None	None	None
Slice Thickness (mm)	3.75	3.75	3.75	3.75	3.75
Interval (mm)	2.25	2.25	2.25	2.25	2.25
Recon 4 (Secondary)					
DFOV	20	20	20	25	25
Recon Type	BonePlus	BonePlus	BonePlus	Bone Plus	Bone Plus
WW/WL	1500/-700	1500/-700	1500/-700	1500/-700	1500/-700
Recon Option	Plus	Plus	Plus	Plus	Plus
Recon Option	IQ Enhance	IQ Enhance	IQ Enhance	IQ Enhance	IQ Enhance
ASiR/ASiR256/DLIR	None	None	None	None	None
Slice Thickness (mm)	1.25	1.25	1.25	1.25	1.25
Interval (mm)	0.625	0.625	0.625	0.625	0.625

Trauma Chest/Abd/Pelvis (Higher Image Quality) 15.1.13/15.2.13/15.4.13/15.6.13/15.8.13

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Clinical Instructions for this protocol are identical to Trauma Chest/Abd/Pelvis 15.1.6/15.2.6/15.4.6/15.6.6/15.8.6

Acquisition Parameters

Series 1, Scout

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-60 cm
Scout 1 kV	**80**	**80**	**80**	**80**	**100**
Scout 1 mA	**10**	**10**	**10**	**10**	**10**
Scout 1 Angle	**180**	**180**	**180**	**180**	**180**
Scout 2 kV	**80**	**80**	**80**	**80**	**100**
Scout 2 mA	**40**	**40**	**40**	**40**	**40**
Scout 2 Angle	**90**	**90**	**90**	**90**	**90**
WW/WL for Scout	**500/50**	**500/50**	**500/50**	**500/50**	**500/50**

Series 2, Smart Prep

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-60 cm
mA	**20**	**40**	**40**	**40**	**40**
Monitoring Delay (sec)	**10.0**	**10.0**	**10.0**	**10.0**	**15.0**
Monitoring ISD (sec)	**2.0**	**2.0**	**2.0**	**2.0**	**2.0**
Enhancement Threshold (HU)	**50**	**50**	**50**	**50**	**50**
Diagnostic Delay	**Auto Minimum**	**Auto Minimum**	**Auto Minimum**	**Auto Minimum**	**Auto Minimum**

Series 2, Group 1, Scan Phase

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-60 cm
Scan Type	**Helical**	**Helical**	**Helical**	**Helical**	**Helical**
Beam Collimation	**20**	**20**	**20**	**40**	**40**
Detector Rows	**32.0**	**32.0**	**32.0**	**64.0**	**64.0**
Detector Configuration	**32x0.625**	**32x0.625**	**32x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Small Body**	**Small Body**	**Small Body**	**Large Body**	**Large Body**
Pitch	**1.375**	**1.375**	**1.375**	**0.516**	**0.516**
Speed (mm/rot)	**27.50**	**27.50**	**27.50**	**20.60**	**20.60**
Rotation Time (s)	**0.5**	**0.5**	**0.7**	**0.6**	**0.6**
kV	**80**	**80**	**80**	**80**	**100**
AEC type	**smart mA**	**smart mA**	**smart mA**	**smart mA**	**smart mA**
mA Range	**(40-260)**	**(50-340)**	**(60-380)**	**(60-350)**	**(70-440)**
Manual mA	**170.0**	**210.0**	**240.0**	**220.0**	**280.0**
Noise Index	**7.0**	**7.5**	**8.5**	**10.0**	**9.5**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.25**	**2.25**	**2.25**	**2.25**	**2.25**

Series 2, Group 1, Recons

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-60 cm
Recon 1 (Primary)					
DFOV	20	20	20	25	25
Recon Type	Detail	Detail	Detail	Detail	Detail
WW/WL	450/50	450/50	450/50	450/50	450/50
Recon Option	Plus	Plus	Plus	Plus	Plus
Recon Option					
ASiR/ASiR256/DLIR	40% / 20% / Medium	40% / 20% / Medium	40% / 20% / Medium	40% / 20% / Medium	40% / 20% / Medium
Slice Thickness (mm)	3.75	3.75	3.75	3.75	3.75
Interval (mm)	2.25	2.25	2.25	2.25	2.25
Recon 2 (Secondary)					
DFOV	20	20	20	25	25
Recon Type	Detail	Detail	Detail	Detail	Detail
WW/WL	450/50	450/50	450/50	450/50	450/50
Recon Option	Plus	Plus	Plus	Plus	Plus
Recon Option	IQ Enhance	IQ Enhance	IQ Enhance	IQ Enhance	IQ Enhance
ASiR/ASiR256/DLIR	40% / 20% / Medium	40% / 20% / Medium	40% / 20% / Medium	40% / 20% / Medium	40% / 20% / Medium
Slice Thickness (mm)	1.25	1.25	1.25	1.25	1.25
Interval (mm)	0.625	0.625	0.625	0.625	0.625
Recon 3 (Secondary)					
DFOV	20	20	20	25	25
Recon Type	BonePlus	BonePlus	BonePlus	Bone Plus	Bone Plus
WW/WL	1500/-700	1500/-700	1500/-700	1500/-700	1500/-700
Recon Option	Plus	Plus	Plus	Plus	Plus
Recon Option	IQ Enhance	IQ Enhance	IQ Enhance	IQ Enhance	IQ Enhance
ASiR/ASiR256/DLIR	None	None	None	None	None
Slice Thickness (mm)	1.25	1.25	1.25	1.25	1.25
Interval (mm)	0.625	0.625	0.625	0.625	0.625

Recon 4 (Secondary)					
DFOV	15	15	15	16	16
Recon Type	Soft	Soft	Soft	Soft	Soft
WW/WL	450/50	450/50	450/50	450/50	450/50
Recon Option	Plus	Plus	Plus	Plus	Plus
Recon Option	IQ Enhance	IQ Enhance	IQ Enhance	IQ Enhance	IQ Enhance
ASiR/ASiR256/DLIR	60% / 30% / Medium	60% / 30% / Medium	60% / 30% / Medium	40% / 20% / Medium	40% / 20% / Medium
Slice Thickness (mm)	1.25	1.25	1.25	1.25	1.25
Interval (mm)	0.625	0.625	0.625	0.625	0.625
Recon 5 (Secondary)					
DFOV	15	15	15	16	16
Recon Type	Bone Plus	Bone Plus	Bone Plus	Bone Plus	Bone Plus
WW/WL	2500/350	2500/350	2500/350	2500/350	2500/350
Recon Option	Plus	Plus	Plus	Plus	Plus
Recon Option	IQ Enhance	IQ Enhance	IQ Enhance	IQ Enhance	IQ Enhance
ASiR/ASiR256/DLIR	None	None	None	None	None
Slice Thickness (mm)	1.25	1.25	1.25	1.25	1.25
Interval (mm)	0.625	0.625	0.625	0.625	0.625
Recon 6 (Secondary)					
DFOV	12	12	12	16	16
Recon Type	Bone Plus	Bone Plus	Bone Plus	Bone Plus	Bone Plus
WW/WL	2500/350	2500/350	2500/350	2500/350	2500/350
Recon Option	Plus	Plus	Plus	Plus	Plus
Recon Option	IQ Enhance	IQ Enhance	IQ Enhance	IQ Enhance	IQ Enhance
ASiR/ASiR256/DLIR	None	None	None	None	None
Slice Thickness (mm)	0.625	0.625	0.625	0.625	0.625
Interval (mm)	0.312	0.312	0.312	0.312	0.312

DLIR Limitations:

1. DLIR is not available on the Primary Recon.
2. DLIR is only compatible with the Standard Algorithm. So, in instances where the primary recon is Soft algorithm,(i.e. many Neuro Protocols) the subsequent recons will be in Standard Algorithm to enable DLIR. The slight difference between the Soft and Standard Algorithms is outweighed by the improvement in image quality with DLIR enabled.
3. DLIR requires an interval exactly half of the slice thickness.
4. DLIR doesn't allow an interval of 0.312 mm. So, if you are on a DLIR enabled scanner, the thin 0.625 recon will be at 0.625x0.625 mm. On all other scanners the thin recon will be at 0.625x0.312 mm.

Series 2, Group2, Scan Phase

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-60 cm
Scan Type	**Helical**	**Helical**	**Helical**	**Helical**	**Helical**
Beam Collimation	**20**	**20**	**20**	**40**	**40**
Detector Rows	**32.0**	**32.0**	**32.0**	**64.0**	**64.0**
Detector Configuration	**32x0.625**	**32x0.625**	**32x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Small Body**	**Small Body**	**Small Body**	**Large Body**	**Large Body**
Pitch	**1.375**	**1.375**	**1.375**	**0.516**	**0.516**
Speed (mm/rot)	**27.50**	**27.50**	**27.50**	**20.60**	**20.60**
Rotation Time (s)	**0.5**	**0.5**	**0.7**	**0.6**	**0.6**
kV	**80**	**80**	**80**	**80**	**100**
AEC type	**smart mA**	**smart mA**	**smart mA**	**smart mA**	**smart mA**
mA Range	**(40-260)**	**(50-340)**	**(60-380)**	**(60-350)**	**(70-440)**
Manual mA	**170.0**	**210.0**	**240.0**	**220.0**	**280.0**
Noise Index	**7.0**	**7.5**	**8.5**	**10.0**	**9.5**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.25**	**2.25**	**2.25**	**2.25**	**2.25**

Series 2, Group2, Recons

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-60 cm
Recon 1 (Primary)					
DFOV	**20**	**20**	**20**	**25**	**25**
Recon Type	**Detail**	**Detail**	**Detail**	**Detail**	**Detail**
WW/WL	**450/50**	**450/50**	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**	**Plus**	**Plus**
Recon Option					
ASiR/ASiR256/DLIR	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.25**	**2.25**	**2.25**	**2.25**	**2.25**
Recon 2 (Secondary)					
DFOV	**20**	**20**	**20**	**25**	**25**
Recon Type	**Detail**	**Detail**	**Detail**	**Detail**	**Detail**
WW/WL	**450/50**	**450/50**	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**	**0.625**	**0.625**

Recon 7 (Secondary)					
DFOV	**15**	**15**	**15**	**16**	**16**
Recon Type	**Soft**	**Soft**	**Soft**	**Soft**	**Soft**
WW/WL	**450/50**	**450/50**	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**60% / 30% / Medium**	**60% / 30% / Medium**	**60% / 30% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**	**0.625**	**0.625**
Recon 8 (Secondary)					
DFOV	**15**	**15**	**15**	**16**	**16**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**2500/350**	**2500/350**	**2500/350**	**2500/350**	**2500/350**
Recon Option	**Plus**	**Plus**	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**	**None**	**None**	**None**	**None**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**	**0.625**	**0.625**
Recon 9 (Secondary)					
DFOV	**12**	**12**	**12**	**16**	**16**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**2500/350**	**2500/350**	**2500/350**	**2500/350**	**2500/350**
Recon Option	**Plus**	**Plus**	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**	**None**	**None**	**None**	**None**
Slice Thickness (mm)	**0.625**	**0.625**	**0.625**	**0.625**	**0.625**
Interval (mm)	**0.312**	**0.312**	**0.312**	**0.312**	**0.312**

Series 3, Scan Phase

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-60 cm
Scan Type	**Helical**	**Helical**	**Helical**	**Helical**	**Helical**
Beam Collimation	**20**	**20**	**20**	**40**	**40**
Detector Rows	**32.0**	**32.0**	**32.0**	**64.0**	**64.0**
Detector Configuration	**32x0.625**	**32x0.625**	**32x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Small Body**	**Small Body**	**Small Body**	**Large Body**	**Large Body**
Pitch	**1.375**	**1.375**	**1.375**	**1.375**	**1.375**
Speed (mm/rot)	**27.50**	**27.50**	**27.50**	**55.00**	**55.00**
Rotation Time (s)	**0.5**	**0.5**	**0.5**	**0.8**	**0.9**
kV	**80**	**80**	**80**	**80**	**100**
AEC type	**smart mA**	**smart mA**	**smart mA**	**smart mA**	**smart mA**
mA Range	**(25-150)**	**(30-190)**	**(50-300)**	**(60-400)**	**(70-440)**
Manual mA	**100.0**	**120.0**	**190.0**	**250.0**	**280.0**
Noise Index	**9.0**	**10.0**	**11.5**	**13.0**	**12.5**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.25**	**2.25**	**2.25**	**2.25**	**2.25**

Series 3, Recons

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-60 cm
Recon 1 (Primary)					
DFOV	**20**	**20**	**20**	**25**	**25**
Recon Type	**Detail**	**Detail**	**Detail**	**Detail**	**Detail**
WW/WL	**450/50**	**450/50**	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**	**Plus**	**Plus**
Recon Option					
ASiR/ASiR256/DLIR	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.25**	**2.25**	**2.25**	**2.25**	**2.25**
Recon 2 (Secondary)					
DFOV	**20**	**20**	**20**	**25**	**25**
Recon Type	**Detail**	**Detail**	**Detail**	**Detail**	**Detail**
WW/WL	**450/50**	**450/50**	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**	**0.625**	**0.625**

Routine Abd/Pelvis (Higher Image Quality) 16.1.6/16.2.6/16.4.6/16.6.6/16.8.6

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Clinical Instructions for this protocol are identical to Routine Abd/Pelvis 16.1.1/16.2.1/16.4.1/16.6.1/16.8.1

Acquisition Parameters

Series 1, Scout

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-60 cm
Scout 1 kV	**80**	**80**	**80**	**80**	**100**
Scout 1 mA	**10**	**10**	**10**	**10**	**10**
Scout 1 Angle	**180**	**180**	**180**	**180**	**180**
Scout 2 kV	**80**	**80**	**80**	**80**	**100**
Scout 2 mA	**40**	**40**	**40**	**40**	**40**
Scout 2 Angle	**90**	**90**	**90**	**90**	**90**
WW/WL for Scout	**500/50**	**500/50**	**500/50**	**500/50**	**500/50**

Series 2, Smart Prep

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-60 cm
mA	**20**	**40**	**40**	**40**	**40**
Monitoring Delay (sec)	**20.0**	**20.0**	**25.0**	**25.0**	**30.0**
Monitoring ISD (sec)	**2.0**	**2.0**	**2.0**	**2.0**	**2.0**
Enhancement Threshold (HU)	**50**	**50**	**50**	**50**	**50**
Diagnostic Delay	**Auto Minimum**	**Auto Minimum**	**Auto Minimum**	**Auto Minimum**	**Auto Minimum**

Series 2, Scan Phase

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-60 cm
Scan Type	**Helical**	**Helical**	**Helical**	**Helical**	**Helical**
Beam Collimation	**20**	**20**	**20**	**40**	**40**
Detector Rows	**32.0**	**32.0**	**32.0**	**64.0**	**64.0**
Detector Configuration	**32x0.625**	**32x0.625**	**32x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Small Body**	**Small Body**	**Small Body**	**Large Body**	**Large Body**
Pitch	**1.375**	**1.375**	**1.375**	**1.375**	**1.375**
Speed (mm/rot)	**27.50**	**27.50**	**27.50**	**55.00**	**55.00**
Rotation Time (s)	**0.5**	**0.5**	**0.5**	**0.8**	**0.9**
kV	**80**	**80**	**80**	**80**	**100**
AEC type	**smart mA**	**smart mA**	**smart mA**	**smart mA**	**smart mA**
mA Range	**(25-150)**	**(30-190)**	**(50-300)**	**(60-400)**	**(70-440)**
Manual mA	**100.0**	**120.0**	**190.0**	**250.0**	**280.0**
Noise Index	**9.0**	**10.0**	**11.5**	**13.0**	**12.5**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.25**	**2.25**	**2.25**	**2.25**	**2.25**

Series 2, Recons

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-60 cm
Recon 1 (Primary)					
DFOV	**20**	**20**	**20**	**25**	**25**
Recon Type	**Detail**	**Detail**	**Detail**	**Detail**	**Detail**
WW/WL	**450/50**	**450/50**	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**	**Plus**	**Plus**
Recon Option					
ASiR/ASiR256/DLIR	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.25**	**2.25**	**2.25**	**2.25**	**2.25**
Recon 2 (Secondary)					
DFOV	**20**	**20**	**20**	**25**	**25**
Recon Type	**Detail**	**Detail**	**Detail**	**Detail**	**Detail**
WW/WL	**450/50**	**450/50**	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**	**0.625**	**0.625**

DLIR Limitations:

1. DLIR is not available on the Primary Recon.
2. DLIR is only compatible with the Standard Algorithm. So, in instances where the primary recon is Soft algorithm,(i.e. many Neuro Protocols) the subsequent recons will be in Standard Algorithm to enable DLIR. The slight difference between the Soft and Standard Algorithms is outweighed by the improvement in image quality with DLIR enabled.
3. DLIR requires an interval exactly half of the slice thickness.
4. DLIR doesn't allow an interval of 0.312 mm. So, if you are on a DLIR enabled scanner, the thin 0.625 recon will be at 0.625x0.625 mm. On all other scanners the thin recon will be at 0.625x0.312 mm.

Renal Stone/Flank Pain (Higher Image Quality) 16.1.6/16.2.6/16.4.6/16.6.6/16.8.6

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Clinical Instructions for this protocol are identical to Renal Stone/Flank Pain 16.1.1/16.2.1/16.4.1/16.6.1/16.8.1

Acquisition Parameters

Series 1, Scout

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-55 cm
Scout 1 kV	**80**	**80**	**80**	**80**	**100**
Scout 1 mA	**10**	**10**	**10**	**10**	**10**
Scout 1 Angle	**180**	**180**	**180**	**180**	**180**
Scout 2 kV	**80**	**80**	**80**	**80**	**100**
Scout 2 mA	**40**	**40**	**40**	**40**	**40**
Scout 2 Angle	**90**	**90**	**90**	**90**	**90**
WW/WL for Scout	**500/50**	**500/50**	**500/50**	**500/50**	**500/50**

Series 2, Scan Phase

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-55 cm
Scan Type	**Helical**	**Helical**	**Helical**	**Helical**	**Helical**
Beam Collimation	**20**	**20**	**20**	**40**	**40**
Detector Rows	**32.0**	**32.0**	**32.0**	**64.0**	**64.0**
Detector Configuration	**32x0.625**	**32x0.625**	**32x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Small Body**	**Small Body**	**Small Body**	**Large Body**	**Large Body**
Pitch	**1.375**	**1.375**	**1.375**	**1.375**	**1.375**
Speed (mm/rot)	**27.50**	**27.50**	**27.50**	**55.00**	**55.00**
Rotation Time (s)	**0.5**	**0.5**	**0.5**	**0.8**	**0.9**
kV	**80**	**80**	**80**	**80**	**100**
AEC type	**smart mA**	**smart mA**	**smart mA**	**smart mA**	**smart mA**
mA Range	**(25-150)**	**(30-190)**	**(50-300)**	**(60-400)**	**(70-440)**
Manual mA	**100.0**	**120.0**	**190.0**	**250.0**	**280.0**
Noise Index	**9.0**	**10.0**	**11.5**	**13.0**	**12.5**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.25**	**2.25**	**2.25**	**2.25**	**2.25**

Series 2, Recons

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-55 cm
Recon 1 (Primary)					
DFOV	**20**	**20**	**20**	**25**	**25**
Recon Type	**Detail**	**Detail**	**Detail**	**Detail**	**Detail**
WW/WL	**450/50**	**450/50**	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**	**Plus**	**Plus**
Recon Option					
ASiR/ASiR256/DLIR	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.25**	**2.25**	**2.25**	**2.25**	**2.25**
Recon 2 (Secondary)					
DFOV	**20**	**20**	**20**	**25**	**25**
Recon Type	**Detail**	**Detail**	**Detail**	**Detail**	**Detail**
WW/WL	**450/50**	**450/50**	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**	**0.625**	**0.625**

Acute Appendicitis - Abd/Pelvis (Higher Image Quality) 16.1.6/16.2.6/16.4.6/16.6.6/16.8.6

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Clinical Instructions for this protocol are identical to Acute Appendicitis - Abd/Pelvis 16.1.1/16.2.1/16.4.1/16.6.1/16.8.1

Acquisition Parameters

This protocol uses the same acquisition parameters as Routine Abd/Pelvis (Higher Image Quality) 16.1.6/16.2.6/16.4.6/16.6.6/16.8.6

CTA ABD - Triphasic Liver (Higher Image Quality) 16.1.8/16.2.8/16.4.8/16.6.8/16.8.8

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Clinical Instructions for this protocol are identical to CTA ABD - Triphasic Liver 16.1.3/16.2.3/16.4.3/16.6.3/16.8.3

Acquisition Parameters

Series 1, Scout

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-60 cm
Scout 1 kV	**80**	**80**	**80**	**80**	**100**
Scout 1 mA	**10**	**10**	**10**	**10**	**10**
Scout 1 Angle	**180**	**180**	**180**	**180**	**180**
Scout 2 kV	**80**	**80**	**80**	**80**	**100**
Scout 2 mA	**40**	**40**	**40**	**40**	**40**
Scout 2 Angle	**90**	**90**	**90**	**90**	**90**
WW/WL for Scout	**500/50**	**500/50**	**500/50**	**500/50**	**500/50**

Series 2, Smart Prep

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-60 cm
mA	**10**	**10**	**10**	**20**	**20**
Monitoring Delay (sec)	**10.0**	**10.0**	**10.0**	**10.0**	**10**
Monitoring ISD (sec)	**2.0**	**2.0**	**2.0**	**2.0**	**2.0**
Enhancement Threshold (HU)	**80**	**80**	**80**	**80**	**80**
Diagnostic Delay	**Auto Minimum**	**Auto Minimum**	**Auto Minimum**	**Auto Minimum**	**Auto Minimum**

Series 2, Group 1, Scan Phase

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-60 cm
Scan Type	**Helical**	**Helical**	**Helical**	**Helical**	**Helical**
Beam Collimation	**20**	**20**	**20**	**40**	**40**
Detector Rows	**32.0**	**32.0**	**32.0**	**64.0**	**64.0**
Detector Configuration	**32x0.625**	**32x0.625**	**32x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Small Body**	**Small Body**	**Small Body**	**Large Body**	**Large Body**
Pitch	**1.375**	**1.375**	**1.375**	**0.516**	**0.516**
Speed (mm/rot)	**27.50**	**27.50**	**27.50**	**20.60**	**20.60**
Rotation Time (s)	**0.5**	**0.5**	**0.7**	**0.6**	**0.6**
kV	**80**	**80**	**80**	**80**	**100**
AEC type	**smart mA**	**smart mA**	**smart mA**	**smart mA**	**smart mA**
mA Range	**(40-260)**	**(50-340)**	**(60-380)**	**(60-350)**	**(70-440)**
Manual mA	**170.0**	**210.0**	**240.0**	**220.0**	**280.0**
Noise Index	**7.0**	**7.5**	**8.5**	**10.0**	**9.5**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.25**	**2.25**	**2.25**	**2.25**	**2.25**

Series 2, Group 1, Recons

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-60 cm
Recon 1 (Primary)					
DFOV	**20**	**20**	**20**	**25**	**25**
Recon Type	**Detail**	**Detail**	**Detail**	**Detail**	**Detail**
WW/WL	**450/50**	**450/50**	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**	**Plus**	**Plus**
Recon Option					
ASiR/ASiR256/DLIR	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.25**	**2.25**	**2.25**	**2.25**	**2.25**
Recon 2 (Secondary)					
DFOV	**20**	**20**	**20**	**25**	**25**
Recon Type	**Detail**	**Detail**	**Detail**	**Detail**	**Detail**
WW/WL	**450/50**	**450/50**	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**	**0.625**	**0.625**

Series 2, Group 2, Scan Phase

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-60 cm
Scan Type	**Helical**	**Helical**	**Helical**	**Helical**	**Helical**
Beam Collimation	**20**	**20**	**20**	**40**	**40**
Detector Rows	**32.0**	**32.0**	**32.0**	**64.0**	**64.0**
Detector Configuration	**32x0.625**	**32x0.625**	**32x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Small Body**	**Small Body**	**Small Body**	**Large Body**	**Large Body**
Pitch	**1.375**	**1.375**	**1.375**	**1.375**	**1.375**
Speed (mm/rot)	**27.50**	**27.50**	**27.50**	**55.00**	**55.00**
Rotation Time (s)	**0.5**	**0.5**	**0.5**	**0.8**	**0.9**
kV	**80**	**80**	**80**	**80**	**100**
AEC type	**smart mA**	**smart mA**	**smart mA**	**smart mA**	**smart mA**
mA Range	**(25-150)**	**(30-190)**	**(50-300)**	**(60-400)**	**(70-440)**
Manual mA	**100.0**	**120.0**	**190.0**	**250.0**	**280.0**
Noise Index	**9.0**	**10.0**	**11.5**	**13.0**	**12.5**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.25**	**2.25**	**2.25**	**2.25**	**2.25**

Series 2, Group 2, Recons

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-60 cm
Recon 1 (Primary)					
DFOV	**20**	**20**	**20**	**25**	**25**
Recon Type	**Detail**	**Detail**	**Detail**	**Detail**	**Detail**
WW/WL	**450/50**	**450/50**	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**	**Plus**	**Plus**
Recon Option					
ASiR/ASiR256/DLIR	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.25**	**2.25**	**2.25**	**2.25**	**2.25**
Recon 2 (Secondary)					
DFOV	**20**	**20**	**20**	**25**	**25**
Recon Type	**Detail**	**Detail**	**Detail**	**Detail**	**Detail**
WW/WL	**450/50**	**450/50**	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**	**0.625**	**0.625**

Series 2, Group 3, Scan Phase

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-60 cm
Scan Type	**Helical**	**Helical**	**Helical**	**Helical**	**Helical**
Beam Collimation	**20**	**20**	**20**	**40**	**40**
Detector Rows	**32.0**	**32.0**	**32.0**	**64.0**	**64.0**
Detector Configuration	**32x0.625**	**32x0.625**	**32x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Small Body**	**Small Body**	**Small Body**	**Large Body**	**Large Body**
Pitch	**1.375**	**1.375**	**1.375**	**1.375**	**1.375**
Speed (mm/rot)	**27.50**	**27.50**	**27.50**	**55.00**	**55.00**
Rotation Time (s)	**0.5**	**0.5**	**0.5**	**0.8**	**0.9**
kV	**80**	**80**	**80**	**80**	**100**
AEC type	**smart mA**	**smart mA**	**smart mA**	**smart mA**	**smart mA**
mA Range	**(25-150)**	**(30-190)**	**(50-300)**	**(60-400)**	**(70-440)**
Manual mA	**100.0**	**120.0**	**190.0**	**250.0**	**280.0**
Noise Index	**9.0**	**10.0**	**11.5**	**13.0**	**12.5**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.25**	**2.25**	**2.25**	**2.25**	**2.25**

Series 2, Group 3, Recons

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-60 cm
Recon 1 (Primary)					
DFOV	**20**	**20**	**20**	**25**	**25**
Recon Type	**Detail**	**Detail**	**Detail**	**Detail**	**Detail**
WW/WL	**450/50**	**450/50**	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**	**Plus**	**Plus**
Recon Option					
ASiR/ASiR256/DLIR	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.25**	**2.25**	**2.25**	**2.25**	**2.25**
Recon 2 (Secondary)					
DFOV	**20**	**20**	**20**	**25**	**25**
Recon Type	**Detail**	**Detail**	**Detail**	**Detail**	**Detail**
WW/WL	**450/50**	**450/50**	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**	**0.625**	**0.625**

DLIR Limitations:

1. DLIR is not available on the Primary Recon.
2. DLIR is only compatible with the Standard Algorithm. So, in instances where the primary recon is Soft algorithm,(i.e. many Neuro Protocols) the subsequent recons will be in Standard Algorithm to enable DLIR. The slight difference between the Soft and Standard Algorithms is outweighed by the improvement in image quality with DLIR enabled.
3. DLIR requires an interval exactly half of the slice thickness.
4. DLIR doesn't allow an interval of 0.312 mm. So, if you are on a DLIR enabled scanner, the thin 0.625 recon will be at 0.625x0.625 mm. On all other scanners the thin recon will be at 0.625x0.312 mm.

Trauma Abd/Pelvis (Higher Image Quality) 16.1.9/16.2.9/16.4.9/16.6.9/16.8.9

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Clinical Instructions for this protocol are identical to Trauma Abd/Pelvis 16.1.4/16.2.4/16.4.4/16.6.4/16.8.4

Acquisition Parameters

Series 1, Scout

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-60 cm
Scout 1 kV	**80**	**80**	**80**	**80**	**100**
Scout 1 mA	**10**	**10**	**10**	**10**	**10**
Scout 1 Angle	**180**	**180**	**180**	**180**	**180**
Scout 2 kV	**80**	**80**	**80**	**80**	**100**
Scout 2 mA	**40**	**40**	**40**	**40**	**40**
Scout 2 Angle	**90**	**90**	**90**	**90**	**90**
WW/WL for Scout	**500/50**	**500/50**	**500/50**	**500/50**	**500/50**

Series 2, Smart Prep

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-60 cm
mA	**20**	**40**	**40**	**40**	**40**
Monitoring Delay (sec)	**20.0**	**20.0**	**25.0**	**25.0**	**30.0**
Monitoring ISD (sec)	**2.0**	**2.0**	**2.0**	**2.0**	**2.0**
Enhancement Threshold (HU)	**50**	**50**	**50**	**50**	**50**
Diagnostic Delay	**Auto Minimum**	**Auto Minimum**	**Auto Minimum**	**Auto Minimum**	**Auto Minimum**

Series 2, Scan Phase

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-60 cm
Scan Type	**Helical**	**Helical**	**Helical**	**Helical**	**Helical**
Beam Collimation	**20**	**20**	**20**	**40**	**40**
Detector Rows	**32.0**	**32.0**	**32.0**	**64.0**	**64.0**
Detector Configuration	**32x0.625**	**32x0.625**	**32x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Small Body**	**Small Body**	**Small Body**	**Large Body**	**Large Body**
Pitch	**1.375**	**1.375**	**1.375**	**0.516**	**0.516**
Speed (mm/rot)	**27.50**	**27.50**	**27.50**	**20.60**	**20.60**
Rotation Time (s)	**0.5**	**0.5**	**0.7**	**0.6**	**0.6**
kV	**80**	**80**	**80**	**80**	**100**
AEC type	**smart mA**	**smart mA**	**smart mA**	**smart mA**	**smart mA**
mA Range	**(40-260)**	**(50-340)**	**(60-380)**	**(60-350)**	**(70-440)**
Manual mA	**170.0**	**210.0**	**240.0**	**220.0**	**280.0**
Noise Index	**7.0**	**7.5**	**8.5**	**10.0**	**9.5**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.25**	**2.25**	**2.25**	**2.25**	**2.25**

Series 2, Recons

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-60 cm
Recon 1 (Primary)					
DFOV	20	20	20	25	25
Recon Type	Detail	Detail	Detail	Detail	Detail
WW/WL	450/50	450/50	450/50	450/50	450/50
Recon Option	Plus	Plus	Plus	Plus	Plus
Recon Option					
ASiR/ASiR256/DLIR	40% / 20% / Medium	40% / 20% / Medium	40% / 20% / Medium	40% / 20% / Medium	40% / 20% / Medium
Slice Thickness (mm)	3.75	3.75	3.75	3.75	3.75
Interval (mm)	2.25	2.25	2.25	2.25	2.25
Recon 2 (Secondary)					
DFOV	20	20	20	25	25
Recon Type	Detail	Detail	Detail	Detail	Detail
WW/WL	450/50	450/50	450/50	450/50	450/50
Recon Option	Plus	Plus	Plus	Plus	Plus
Recon Option	IQ Enhance	IQ Enhance	IQ Enhance	IQ Enhance	IQ Enhance
ASiR/ASiR256/DLIR	40% / 20% / Medium	40% / 20% / Medium	40% / 20% / Medium	40% / 20% / Medium	40% / 20% / Medium
Slice Thickness (mm)	1.25	1.25	1.25	1.25	1.25
Interval (mm)	0.625	0.625	0.625	0.625	0.625
Recon 3 (Secondary)					
DFOV	15	15	15	16	16
Recon Type	Soft	Soft	Soft	Soft	Soft
WW/WL	450/50	450/50	450/50	450/50	450/50
Recon Option	Plus	Plus	Plus	Plus	Plus
Recon Option	IQ Enhance	IQ Enhance	IQ Enhance	IQ Enhance	IQ Enhance
ASiR/ASiR256/DLIR	60% / 30% / Medium	60% / 30% / Medium	60% / 30% / Medium	40% / 20% / Medium	40% / 20% / Medium
Slice Thickness (mm)	1.25	1.25	1.25	1.25	1.25
Interval (mm)	0.625	0.625	0.625	0.625	0.625
Recon 4 (Secondary)					
DFOV	15	15	15	16	16
Recon Type	Bone Plus	Bone Plus	Bone Plus	Bone Plus	Bone Plus
WW/WL	2500/350	2500/350	2500/350	2500/350	2500/350
Recon Option	Plus	Plus	Plus	Plus	Plus
Recon Option	IQ Enhance	IQ Enhance	IQ Enhance	IQ Enhance	IQ Enhance
ASiR/ASiR256/DLIR	None	None	None	None	None
Slice Thickness (mm)	1.25	1.25	1.25	1.25	1.25
Interval (mm)	0.625	0.625	0.625	0.625	0.625
Recon 5 (Secondary)					
DFOV	12	12	12	12	12
Recon Type	Bone Plus	Bone Plus	Bone Plus	Bone Plus	Bone Plus
WW/WL	2500/350	2500/350	2500/350	2500/350	2500/350
Recon Option	Plus	Plus	Plus	Plus	Plus
Recon Option	IQ Enhance	IQ Enhance	IQ Enhance	IQ Enhance	IQ Enhance
ASiR/ASiR256/DLIR	None	None	None	None	None
Slice Thickness (mm)	0.625	0.625	0.625	0.625	0.625
Interval (mm)	0.312	0.312	0.312	0.312	0.312

Series 3, Scan Phase

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-60 cm
Scan Type	**Helical**	**Helical**	**Helical**	**Helical**	**Helical**
Beam Collimation	**20**	**20**	**20**	**40**	**40**
Detector Rows	**32.0**	**32.0**	**32.0**	**64.0**	**64.0**
Detector Configuration	**32x0.625**	**32x0.625**	**32x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Small Body**	**Small Body**	**Small Body**	**Large Body**	**Large Body**
Pitch	**1.375**	**1.375**	**1.375**	**1.375**	**1.375**
Speed (mm/rot)	**27.50**	**27.50**	**27.50**	**55.00**	**55.00**
Rotation Time (s)	**0.5**	**0.5**	**0.5**	**0.8**	**0.9**
kV	**80**	**80**	**80**	**80**	**100**
AEC type	**smart mA**	**smart mA**	**smart mA**	**smart mA**	**smart mA**
mA Range	**(25-150)**	**(30-190)**	**(50-300)**	**(60-400)**	**(70-440)**
Manual mA	**100.0**	**120.0**	**190.0**	**250.0**	**280.0**
Noise Index	**9.0**	**10.0**	**11.5**	**13.0**	**12.5**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.25**	**2.25**	**2.25**	**2.25**	**2.25**

Series 3, Recons

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-60 cm
Recon 1 (Primary)					
DFOV	**20**	**20**	**20**	**25**	**25**
Recon Type	**Detail**	**Detail**	**Detail**	**Detail**	**Detail**
WW/WL	**450/50**	**450/50**	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**	**Plus**	**Plus**
Recon Option					
ASiR/ASiR256/DLIR	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.25**	**2.25**	**2.25**	**2.25**	**2.25**
Recon 2 (Secondary)					
DFOV	**20**	**20**	**20**	**25**	**25**
Recon Type	**Detail**	**Detail**	**Detail**	**Detail**	**Detail**
WW/WL	**450/50**	**450/50**	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**	**0.625**	**0.625**

Pediatric Neck/Chest/Abd/Pelvis (HIQ)

Pediatric patients between the age of 18-20 yrs: to be scanned C/A/P in one scan. Do not scan using two groups.

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Indication

Chest with contrast: Initial evaluations for metastatic disease. Chest without contrast: Follow-up osteosarcoma mets

C/A/P: Neoplasm, fever of unknown origin, infection. Metastatic disease workup/follow-up.

Neck: mass, globus sensation, lymphadenopathy, head and neck cancer evaluation/follow-up, pharyngitis, tonsillar or peritonsillar abscess, neck abscess

Oral Contrast

These are target volumes for oral contrast. If the child is vomiting or otherwise unable to tolerate the total amount, it can obviously be decreased. For optimal interpretation of these scans, encourage the above amounts.

Hydrate ER patient if time allows

Mix 4mL Iohexol 300 (Omnipaque) in 200mL of a clear liquid.

Age	Weight (lbs)	Total Oral Contrast Quantity
0 - 1	10 - 25	100 mLs
1 - 3	20 - 40	200 mLs
3 - 5	30 - 60	400 mLs
5 - 10	40 - 90	600 mLs
11+	over 90	800 mLs +

Pre-Scan Instructions

CAP portion

- To properly select a pediatric protocol size:
  - First use the patient's age to select scout parameters
  - After acquiring the scout, measure the PA + Lateral widths
  - Scan using the protocol corresponding to the sum of the AP+Lateral measurements (you may need to select a protocol that does not match the patient's age)

Color Grouping	Pink	Red/Purple	Yellow/White	Blue/Orange	Green/Black
Age	Newborn	6 mo - 2.5 yr	3-7 yr	8-12 yr	13-18 yr
PA + Lat (cm)	0-26	27-31	32-37	38-43	44-60

- If the patient is bigger than 60 cm scan in a Medium Adult protocol and perform the adult reformats. If the patient requires an adult medium or large protocol, please delete the abd/pel group and extend the chest through the pelvis, **scan in one group**, **not two**.

Neck portion

- Patient supine, PA and lateral scouts from sella to mid chest (include the aortic arch), no gantry angle

- Have the patient remove any dentures or removable teeth, please place the shoulders as low possible
- Positioning: Tilt the patient's head so that a line connecting the lateral canthus of the eye and the EAC is perpendicular to the CT tabletop (see head CT protocol).
- Remove all metallic and high-density objects from the scanning area.
- If the indication is for neck mass, especially for first time scans, please have patient place a BB on the palpable mass.
- Right sided IV is always preferred (not required) for imaging of the neck due to contrast reflux into the brachiocephalic veins.
- Perform angled views if there are artifacts from dental fillings or metal hardware. Check with Radiologist before performing angled views on Pediatric patients, we rarely do these (see below)

IV Contrast Parameters

When scanning a pediatric Neck + C/A/P -OR- Neck + Chest with contrast (based on patient's weight)

1. Use the weight conversion tables provided below to get the TOTAL contrast volume needed for both exams

Weight Range	Contrast Volume
0 - 80 kg (0-175lbs)	1.3 mL/kg or (.6 mL/lb) Iohexol 350
Over 80kg (>176 lbs)	Use adult dosage

Weight Range	Contrast Volume
0 - 80 kg (0-175lbs)	1.5 mL/kg or (.7mL/lb) Iohexol 300
Over 80kg (>176 lbs)	Use adult dosage

2. Use the table below to determine how much contrast to inject for exam.

Scan Combination	Contrast Dosage	Injection Rate
C/A/P + Neck Combo split the total contrast into thirds.		
C/A/P	Use 2/3 total volume Iohexol 300 mgI/mL + 30 mL NaCl flush	1.5 - 3 mL/s
Neck	Use remaining 1/3 total volume Iohexol 300 mgI/mL + 20 mL NaCl flush	2 mL/s
Change the Prep Delay to 20 seconds (from 45 seconds) on the Neck protocol.		
Chest + Neck Combo split the total contrast in half.		
Chest	Use 1/2 total volume Iohexol 300 mgI/mL + 30 mL NaCl flush	1.5 - 3 mL/s
Neck	Use remaining 1/2 total volume Iohexol 300 mgI/mL + 20 mL NaCl flush	2 mL/s
Change the Prep Delay to 20 seconds (from 45 seconds) on the Neck protocol.		

Field of View

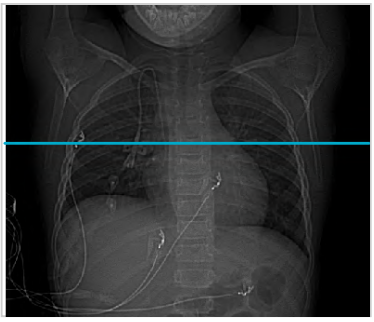
Same as previous study or as small as appropriate

Scan Description

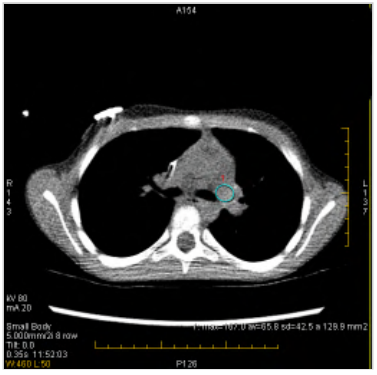
Chest only

- **Series 1** – PA & Lateral Scout: from base of neck through lung bases with inspiration

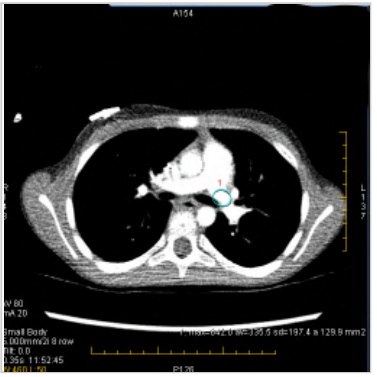
- **Series 2** - Helical: Scan from just above the lung apices and extend through lung bases with full inspiration.
- Smart prep: Place ROI on the pulmonary artery. Once it reaches the proper threshold, hit scan phase. The scan will then have a 12 second diagnostic delay built in. If enhancement threshold is not reach by 50 seconds, start the scan.



Scout



ROI Location

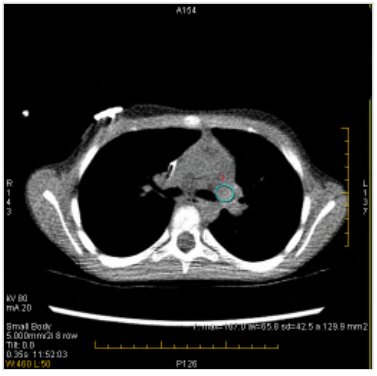


ROI Location

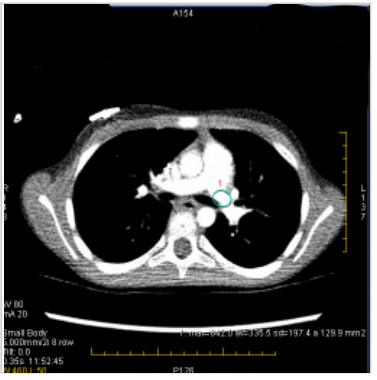
C/A/P

- **Series 1** – PA & Lateral Scout: from base of neck through pubic symphysis
- **Series 2** - Helical Phase: Scan Chest/ Abdomen/Pelvis in portal venous phase. Start scan just above the lung apices. For a Chest/Abdomen, end at the iliac crests and for a full CAP end at the pubic symphysis. **If the patient requires an adult medium or large protocol, please delete the abd/pel group and extend the chest through the pelvis, scan in one group, not two**. You may want to turn off your DMPR's and manually preform the reformats.
    - Smart prep: Center over the pulmonary artery. There is a built in diagnostic delay of 20 seconds after the smart prep enhancement threshold is reached.

Scout



ROI Location



ROI Location

Neck

- Series 1 – Scouts PA and Lateral: from the top of the orbit to the carina.
- Series 2 – Neck with Contrast: Begin Scanning **20 seconds** after the start of injection: Start the scan at the top of the orbit and scan to the carina. Remind the patient not to swallow during the scan.

Please remember to change the prep group delay in the neck protocol to 20 seconds

Reformat Instructions

Use DMPR on THIN ST.

Reformats

C/CAP

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
PEDS SA CHEST	THIN LUNG	Manual	Average	1500/-700	4	2	sagittal
PEDS CO CHEST	THIN LUNG	Manual	Average	1500/-700	4	2	coronal
SA PEDS	Thin ST	DMPR	Average	450/50	4	2	sagittal
CO PEDS	Thin ST	DMPR	Average	450/50	4	2	coronal
AX MIPS	THIN ST	Manual	MIP	1500/-700	10	5	Axial

Neck

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
CO ST	Thin ST	Manual	Average	400/60	3	1.5	Coronal
CO BONE	Thin Bone	Manual	Average	2500/350	1.5	0.75	Coronal
SA ST	Thin ST	Manual	Average	400/60	3	1.5	Sagittal
SA BONE	Thin Bone	Manual	Average	2500/350	1.5	0.75	Sagittal

Networking

- All Images to PACS (ALI_Store).
- Note: if smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

Miscellaneous

None

Acquisition Parameters

Use routine (or high image quality if you desire) pediatric CAP protocol followed by the routine pediatric Neck Protocol.

Pediatric Brain - Routine and NAT/Trauma (Helical Mode) 11.1/11.2/11.3

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

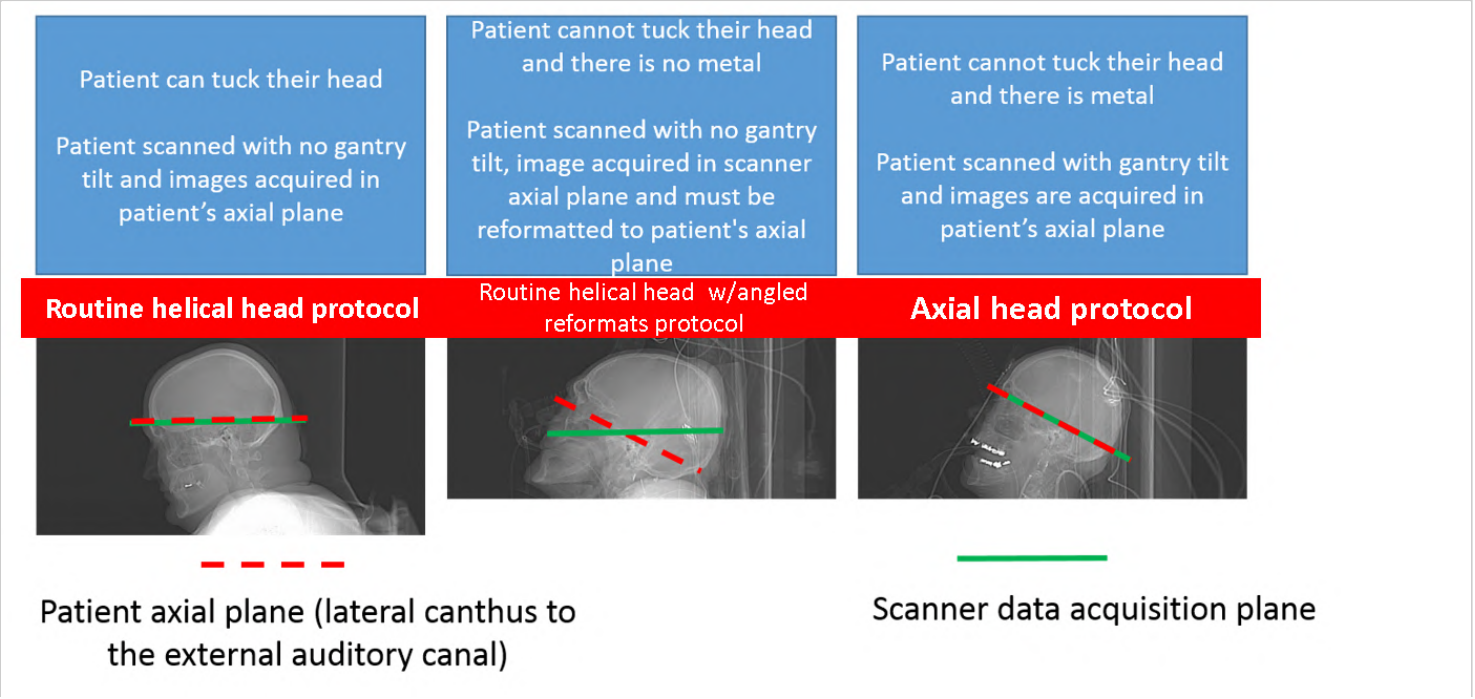
Indication

Mental status change, trauma, stroke, fall, intracranial hemorrhage.

Videos for this protocol

Routine head imaging

Head with contrast



Guidance on choosing the correct version of the routine head protocol

Oral Contrast

None

Pre-Scan Instructions

- Helical mode should be used routinely for head CT scans. Only use axial mode when you cannot move the patient's head into proper position (trauma, cervical collar, rigid neck), AND dental work would cause streak artifact in base of brain.
- Positioning: Tilt the patients head so that a line connecting the lateral canthus of the eye and the EAC is perpendicular to the CT tabletop (see below). Use axial mode and angle the gantry if you cannot place the patient's head within 15 degrees of the proper setup angle.

- Remove all metallic and high-density objects from the scanning area.

IV Contrast Parameters 350

Weight Ranges	Contrast Dosage	Injection Rate
0-87 kg (0-191 lbs)	1.3 mL/kg (0.6 ml/lbs) of Iohexol 350 mgI/mL	2 mL/sec
Begin scanning 5 minutes after end of injection (~6 minutes from start of injection)		

IV Contrast Parameters 300/370

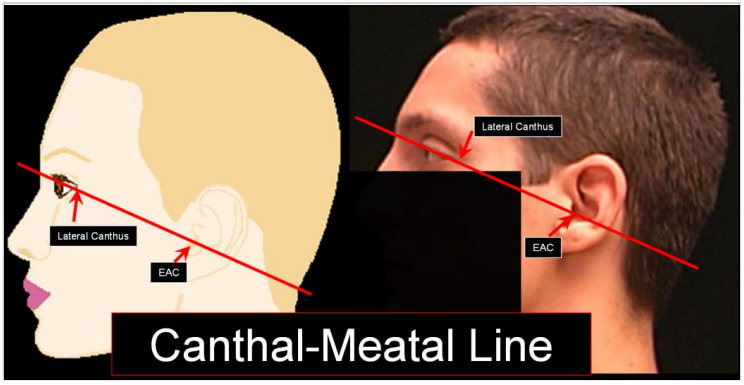
Weight Ranges	Contrast Dosage	Injection Rate
0-80 kg (0-175 lbs)	1.5 mL/kg (0.7 ml/lbs) of Iohexol 300 mgI/mL	2 mL/sec
Begin scanning 5 minutes after end of injection (~6 minutes from start of injection)		

Field of View

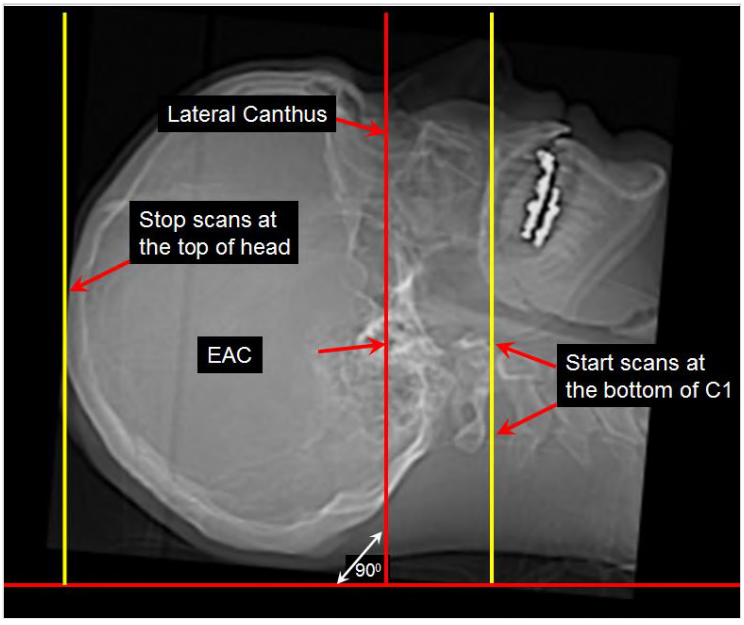
Preferred 22 cm

Scan Description

- Series 1-Scouts PA and Lateral
- Series 2-Scan Phase
  - Scan Range, start scans at the bottom of C1 and scan through the top of the head
  - If Pediatric NAT or Pediatric Trauma, turn on Recon 4 (1.25 mm bone) in order to make the Peds reformats (described in the table below)
  - If CT Head with IV Contrast only is ordered, skip the Head w/o series and use the next series.



Canthal-Meatal Line



Scan range for brain

Reformat Instructions

For Routine Peds CT Head imaging: see the general table below.

For NAT and Pediatric Trauma: See the additional Reformat Table AND Perform a 3D.

Reformats

Name (Peds)	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL (Peds)	Slice Thickness (mm) (Peds)	Interval (mm) (Peds)	Orientation
CO ST	THIN ST	Manual	Average	150/30	3	1.5	Coronal
SA ST	THIN ST	Manual	Average	150/30	3	1.5	Sagittal

Only for Pediatric NAT/Trauma, also do

Name (Peds NAT/Trauma)	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
CO BONE	THIN BONE	Manual	Average	2500/350	1.25	0.625	Coronal
SA BONE	THIN BONE	Manual	Average	2500/350	1.25	0.625	Sagittal

Networking

- All Images to PACS (ALI_Store).

- Note: if smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

Miscellaneous

Choose the CT scan factors on the scanner for the proper age range of the patient:

- Adult: (>= 18 years)
- Adolescent: (7 - 17 years)
- Child: (3 – 6 years)
- Infant: (0 – 2 years)

Acquisition Parameters

Series 1, Scout

	Infant	Child	Adolescent
Scout 1 kV	**80**	**100**	**120**
Scout 1 mA	**10**	**10**	**10**
Scout 1 Angle	**180**	**180**	**180**
Scout 2 kV	**80**	**100**	**120**
Scout 2 mA	**20**	**20**	**20**
Scout 2 Angle	**90**	**90**	**90**
WW/WL for Scout	**500/50**	**500/50**	**500/50**

Series 2, Scan Phase

	Infant	Child	Adolescent
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**20**	**20**	**20**
Detector Rows	**32.0**	**32.0**	**32.0**
Detector Configuration	**32x0.625**	**32x0.625**	**32x0.625**
Scan FOV	**Head**	**Head**	**Head**
Pitch	**0.531**	**0.531**	**0.531**
Speed (mm/rot)	**10.60**	**10.60**	**10.60**
Rotation Time (s)	**0.5**	**0.5**	**0.5**
kV	**80**	**100**	**120**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(130-400)**	**(130-440)**	**(130-440)**
Manual mA	**210.0**	**210.0**	**210.0**
Noise Index	**3.4**	**3.4**	**3.4**
Slice Thickness (mm)	**5**	**5**	**5**
Interval (mm)	**3.0**	**3.0**	**3.0**

Series 2, Recons

	Infant	Child	Adolescent
Recon 1 (Primary)			
DFOV	**22**	**22**	**22**
Recon Type	**Soft**	**Soft**	**Soft**
WW/WL	**80/25**	**80/25**	**80/25**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option			
ASiR/ASiR256/DLIR	**60% / 30% / Medium**	**60% / 30% / Medium**	**60% / 30% / Medium**
Slice Thickness (mm)	**5.0**	**5.0**	**5.0**
Interval (mm)	**3.0**	**3.0**	**3.0**
Recon 2 (Secondary)			
DFOV	**22**	**22**	**22**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**2500/350**	**2500/350**	**2500/350**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option			
ASiR/ASiR256/DLIR	**None**	**None**	**None**
Slice Thickness (mm)	**2.5**	**2.5**	**2.5**
Interval (mm)	**1.5**	**1.5**	**1.5**
Recon 3 (Secondary)			
DFOV	**22**	**22**	**22**
Recon Type	**Soft**	**Soft**	**Soft**
WW/WL	**180/25**	**180/25**	**180/25**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**80% / 40% / High**	**80% / 40% / High**	**80% / 40% / High**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Series 3, Scan Phase

	Infant	Child	Adolescent
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**20**	**20**	**20**
Detector Rows	**32.0**	**32.0**	**32.0**
Detector Configuration	**32x0.625**	**32x0.625**	**32x0.625**
Scan FOV	**Head**	**Head**	**Head**
Pitch	**0.531**	**0.531**	**0.531**
Speed (mm/rot)	**10.60**	**10.60**	**10.60**
Rotation Time (s)	**0.6**	**0.7**	**0.6**
kV	**80**	**80**	**100**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(110-370)**	**(110-390)**	**(130-450)**
Manual mA	**170.0**	**190.0**	**230.0**
Noise Index	**3.4**	**4.0**	**4.0**
Slice Thickness (mm)	**5**	**5**	**5**
Interval (mm)	**3.0**	**3.0**	**3.0**

Series 3, Recons

	Infant	Child	Adolescent
Recon 1 (Primary)			
DFOV	**22**	**22**	**22**
Recon Type	**Soft**	**Soft**	**Soft**
WW/WL	**80/25**	**80/25**	**80/25**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option			
ASiR/ASiR256/DLIR	**60% / 30% / Medium**	**60% / 30% / Medium**	**60% / 30% / Medium**
Slice Thickness (mm)	**5.0**	**5.0**	**5.0**
Interval (mm)	**3.0**	**3.0**	**3.0**
Recon 2 (Secondary)			
DFOV	**22**	**22**	**22**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**2500/350**	**2500/350**	**2500/350**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option			
ASiR/ASiR256/DLIR	**None**	**None**	**None**
Slice Thickness (mm)	**2.5**	**2.5**	**2.5**
Interval (mm)	**1.5**	**1.5**	**1.5**
Recon 3 (Secondary)			
DFOV	**22**	**22**	**22**
Recon Type	**Soft**	**Soft**	**Soft**
WW/WL	**180/25**	**180/25**	**180/25**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**80% / 40% / High**	**80% / 40% / High**	**80% / 40% / High**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Pediatric Brain - Helical Scan with Angled Axial Reformations 11.4/11.5/11.6

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

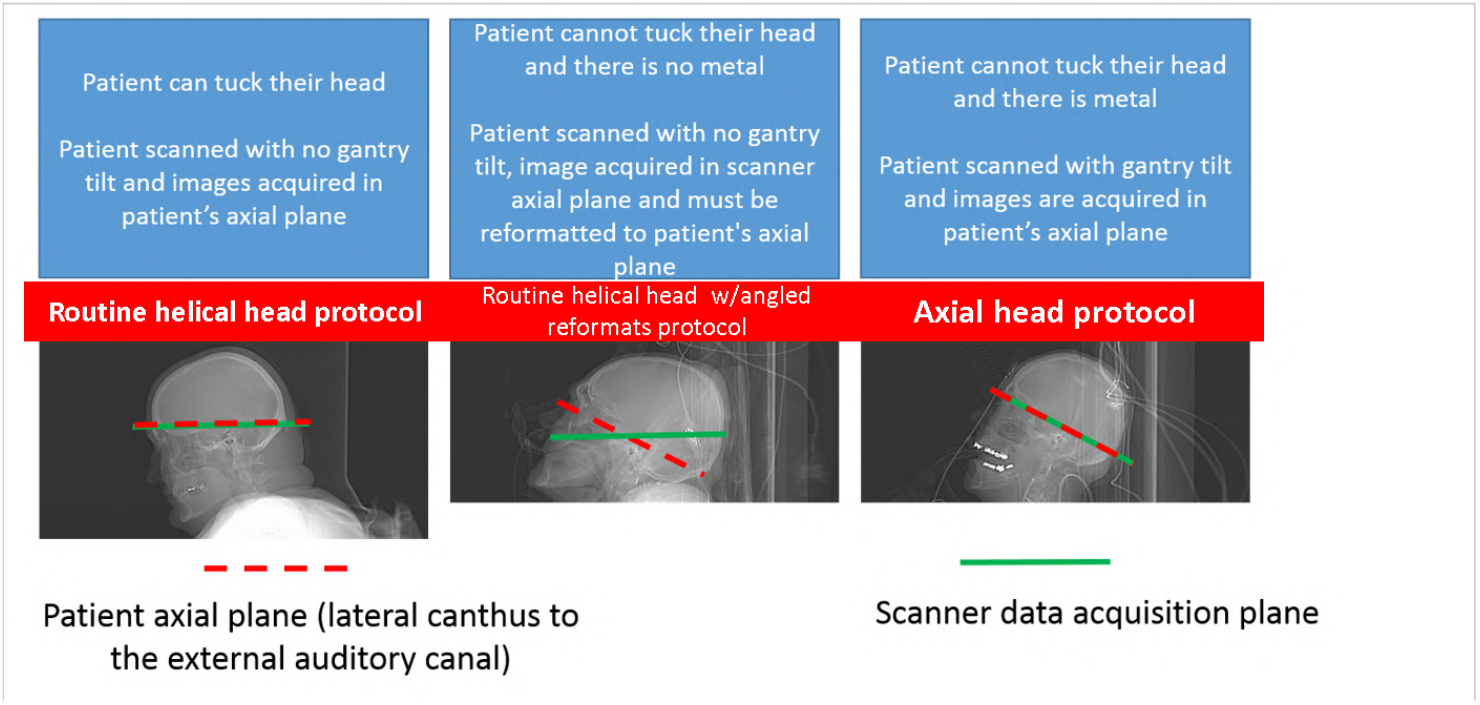
Indication

Mental status change, trauma, stroke, fall, intracranial hemorrhage.

Videos for this protocol

Routine head imaging

Head with contrast



Guidance on choosing the correct version of the routine head protocol

Oral Contrast

None

Pre-Scan Instructions

- 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).
- Important: Be certain that dental filling artifact does not extend across the brain on the helical raw data. If it does, then use the axial mode head protocol instead.
- Remove all metallic and high-density objects from the scanning area.

IV Contrast Parameters 350

Weight Ranges	Contrast Dosage	Injection Rate
0-87 kg (0-191 lbs)	1.3 mL/kg (0.6 ml/lbs) of Iohexol 350 mgI/mL	2 mL/sec
Begin scanning 5 minutes after end of injection (~6 minutes from start of injection)		

IV Contrast Parameters 300/370

Weight Ranges	Contrast Dosage	Injection Rate
0-80 kg (0-175 lbs)	1.5 mL/kg (0.7 ml/lbs) of Iohexol 300 mgI/mL	2 mL/sec
Begin scanning 5 minutes after end of injection (~6 minutes from start of injection)		

Field of View

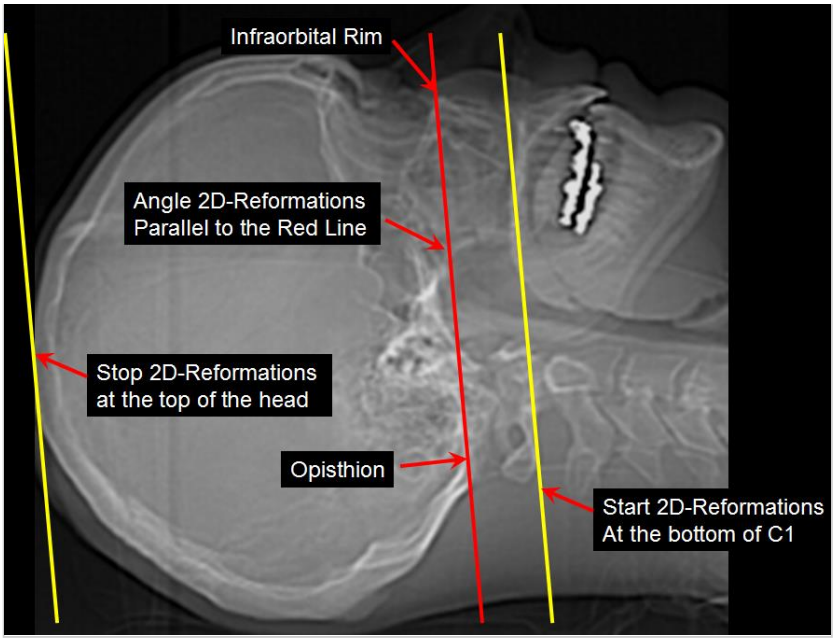
Preferred 22 cm

Scan Description

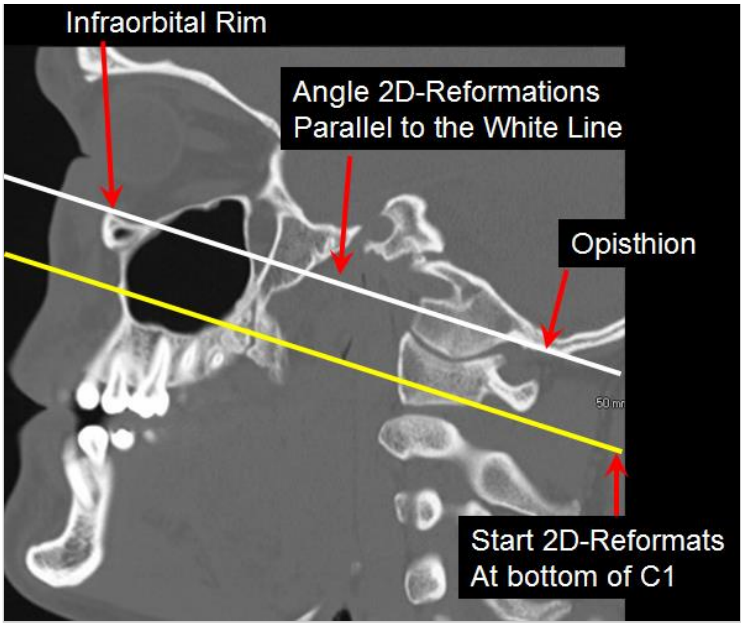
- Series 1 - Scouts PA and Lateral
- Series 2 – Start the scans at C1 and scan through the top of the head

Reformat Instructions

Obtain Axial 2D - reformats parallel to a line connecting the infraorbital rim with the opisthion (base of skull) (See below). Use Multi-oblique tool in reformat to correct for misaligned patient. Then scroll in Sagittal port to locate infraorbital rim and choose proper angle of reconstruction. Align Batch with infraorbital rim and opisthion (base of skull), starting bottom-up. Reset pointer, making sure to re-adjust your multi-oblique lines if necessary.



Helical Scan with Angled Axial Reformations



Helical

Reformats

Name (Peds)	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL (Peds)	Slice Thickness (mm) (Peds)	Interval (mm) (Peds)	Orientation
AX ST	THIN ST	Manual	Average	80/25	5	2.5	Axial
AX BONE	BONE	Manual	Average	2500/350	2.5	1.25	Axial
CO ST	THIN ST	Manual	Average	180/25	3	1.5	Coronal
SA ST	THIN ST	Manual	Average	180/25	3	1.5	Sagittal

Networking

- All Images to PACS (ALI_Store).
- Note: if smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

Miscellaneous

Choose the CT scan factors on the scanner for the proper age range of the patient:

- Adult: (>= 18 years)
- Adolescent: (7 - 17 years)
- Child: (3 – 6 years)
- Infant: (0 – 2 years)

Acquisition Parameters

Series 1, Scout

	Infant	Child	Adolescent
Scout 1 kV	80	100	120
Scout 1 mA	10	10	10
Scout 1 Angle	180	180	180
Scout 2 kV	80	100	120
Scout 2 mA	20	20	20
Scout 2 Angle	90	90	90
WW/WL for Scout	500/50	500/50	500/50

Series 2, Scan Phase

	Infant	Child	Adolescent
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**20**	**20**	**20**
Detector Rows	**32.0**	**32.0**	**32.0**
Detector Configuration	**32x0.625**	**32x0.625**	**32x0.625**
Scan FOV	**Head**	**Head**	**Head**
Pitch	**0.531**	**0.531**	**0.531**
Speed (mm/rot)	**10.60**	**10.60**	**10.60**
Rotation Time (s)	**0.5**	**0.5**	**0.5**
kV	**80**	**100**	**120**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(130-400)**	**(130-440)**	**(130-440)**
Manual mA	**210.0**	**210.0**	**210.0**
Noise Index	**6.8**	**6.8**	**6.8**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Series 2, Recons

	Infant	Child	Adolescent
Recon 1 (Primary)			
DFOV	**22**	**22**	**22**
Recon Type	**Soft**	**Soft**	**Soft**
WW/WL	**180/25**	**180/25**	**180/25**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**60% / 30% / High**	**60% / 30% / High**	**60% / 30% / High**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**
Recon 2 (Secondary)			
DFOV	**22**	**22**	**22**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**2500/350**	**2500/350**	**2500/350**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**	**None**	**None**
Slice Thickness (mm)	**0.625**	**0.625**	**0.625**
Interval (mm)	**0.312**	**0.312**	**0.312**

Series 3, Scan Phase

	Infant	Child	Adolescent
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**20**	**20**	**20**
Detector Rows	**32.0**	**32.0**	**32.0**
Detector Configuration	**32x0.625**	**32x0.625**	**32x0.625**
Scan FOV	**Head**	**Head**	**Head**
Pitch	**0.531**	**0.531**	**0.531**
Speed (mm/rot)	**10.60**	**10.60**	**10.60**
Rotation Time (s)	**0.6**	**0.7**	**0.6**
kV	**80**	**80**	**100**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(110-370)**	**(110-390)**	**(130-450)**
Manual mA	**170.0**	**190.0**	**230.0**
Noise Index	**6.8**	**8.0**	**8.0**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Series 3, Recons

	Infant	Child	Adolescent
Recon 1 (Primary)			
DFOV	**22**	**22**	**22**
Recon Type	**Soft**	**Soft**	**Soft**
WW/WL	**180/25**	**180/25**	**180/25**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**60% / 30% / High**	**60% / 30% / High**	**60% / 30% / High**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**
Recon 2 (Secondary)			
DFOV	**22**	**22**	**22**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**2500/350**	**2500/350**	**2500/350**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**	**None**	**None**
Slice Thickness (mm)	**0.625**	**0.625**	**0.625**
Interval (mm)	**0.312**	**0.312**	**0.312**

16 & 32 Slice Scanner Exceptions:

1. The 0.625mm slice thickness x 0.312mm interval Recon should be 1.25mm slice thickness x 0.625mm interval on 16 and 32 slice CT scanners. The 16 and 32 slice scanners are only able to recon down to 0.625mm slice thickness when using 10mm and/or 20mm beam collimation respectively. However, when using 20mm and/or 40mm beam collimation, they are only capable of reconstructing to 1.25mm slice thickness.
2. MARS feature is not an option.
3. IQ Enhance feature requires thin slices (1.25mm or less) with an interval of half (or less). On older scanner models, in order to enable IQ Enhance at 0.625 mm slice thickness, the interval must be set to 0.311 mm instead of 0.312 mm.

Pediatric Brain (Axial Mode) 11.7/11.8/11.9

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

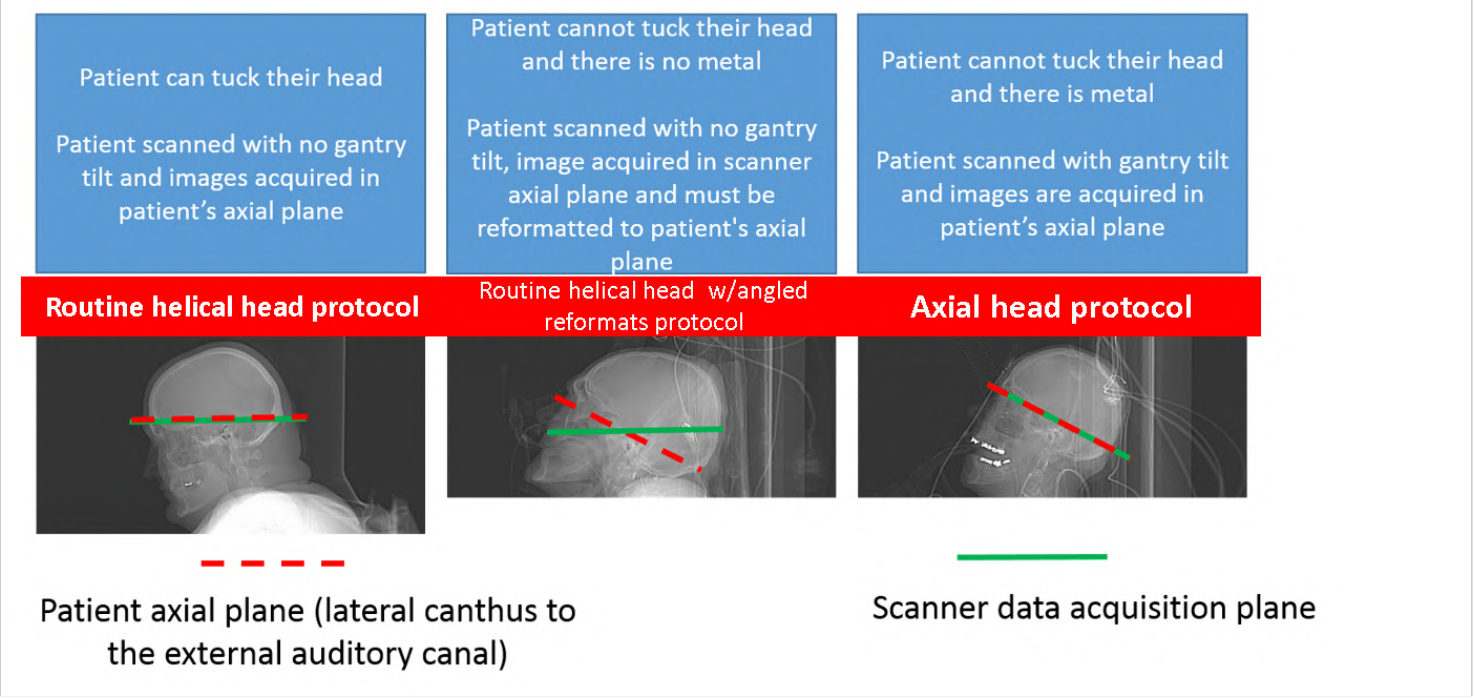
Indication

Mental status change, trauma, stroke, fall, intracranial hemorrhage.

Videos for this protocol

Routine head imaging

Head with contrast



Guidance on choosing the correct version of the routine head protocol

Oral Contrast

None

Pre-Scan Instructions

- Helical mode should be used routinely for head CT scans. Only use axial mode when you cannot move the patient's head into proper position (trauma, cervical collar, rigid neck). This mode can also be used in unstable patients in the ED when the CT scan time must be expedited.
- Patient Positioning: Using the lateral scout image, angle the gantry so that it is parallel to a line connecting the infraorbital rim with the opisthion (see below).
- Remove all metallic and high-density objects from the scanning area.

IV Contrast Parameters 350

Weight Ranges	Contrast Dosage	Injection Rate
0-87 kg (0-191 lbs)	1.3 mL/kg (0.6 ml/lbs) of Iohexol 350 mgI/mL	2 mL/sec
Begin scanning 5 minutes after end of injection (~6 minutes from start of injection)		

IV Contrast Parameters 300/370

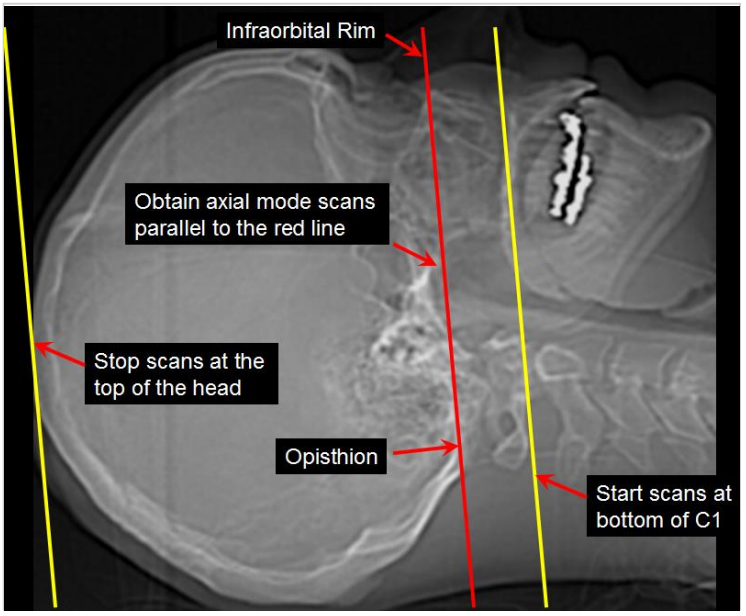
Weight Ranges	Contrast Dosage	Injection Rate
0-80 kg (0-175 lbs)	1.5 mL/kg (0.7 ml/lbs) of Iohexol 300 mgI/mL	2 mL/sec
Begin scanning 5 minutes after end of injection (~6 minutes from start of injection)		

Field of View

Preferred 22 cm

Scan Description

- Series 1 - Scouts PA and Lateral
- Series 2 – Start scans at the bottom of C1 and scan through the top of the head



sagittal brain

Reformat Instructions

No special reformat instructions, see the reformat section for basic details.

Reformats

Name (Peds)	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL (Peds)	Slice Thickness (mm) (Peds)	Interval (mm) (Peds)	Orientation
CO ST	THIN ST	Manual	Average	150/30	3	1.5	Coronal
SA ST	THIN ST	Manual	Average	150/30	3	1.5	Sagittal

Networking

- All Images to PACS (ALI_Store).
- Note: if smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

Miscellaneous

Choose the CT scan factors on the scanner for the proper age range of the patient:

- Adult: (>= 18 years)
- Adolescent: (7 - 17 years)
- Child: (3 – 6 years)
- Infant: (0 – 2 years)

Acquisition Parameters

Series 1, Scout

	Infant	Child	Adolescent
Scout 1 kV	**80**	**100**	**120**
Scout 1 mA	**10**	**10**	**10**
Scout 1 Angle	**180**	**180**	**180**
Scout 2 kV	**80**	**100**	**120**
Scout 2 mA	**20**	**20**	**20**
Scout 2 Angle	**90**	**90**	**90**
WW/WL for Scout	**500/50**	**500/50**	**500/50**

Series 2, Scan Phase

	Infant	Child	Adolescent
Scan Type	**Axial**	**Axial**	**Axial**
Beam Collimation	**10**	**10**	**10**
Detector Rows	**16.0**	**16.0**	**16.0**
Detector Configuration	**16x0.625**	**16x0.625**	**16x0.625**
Scan FOV	**Head**	**Head**	**Head**
Pitch	**1**	**1**	**1**
Speed (mm/rot)	**10.00**	**10.00**	**10.00**
Rotation Time (s)	**1**	**0.9**	**0.8**
kV	**80**	**100**	**120**
AEC type	**Manual mA**	**Manual mA**	**Manual mA**
mA Range	**(120-400)**	**(130-460)**	**(150-520)**
Manual mA	**290.0**	**330.0**	**370.0**
Noise Index	**3.5**	**3.6**	**3.4**
Slice Thickness (mm)	**5**	**5**	**5**
Interval (mm)	**10**	**10**	**10**

Series 2, Recons

	Infant	Child	Adolescent
Recon 1 (Primary)			
DFOV	**22**	**22**	**22**
Recon Type	**Soft**	**Soft**	**Soft**
WW/WL	**80/25**	**80/25**	**80/25**
Recon Option	**Full**	**Full**	**Full**
Recon Option			
ASiR/ASiR256/DLIR	**60% / 30% / High**	**60% / 30% / High**	**60% / 30% / High**
Slice Thickness (mm)	**5.0**	**5.0**	**5.0**
Interval (mm)	**N/A**	**N/A**	**N/A**
Recon 2 (Secondary)			
DFOV	**22**	**22**	**22**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**2500/350**	**2500/350**	**2500/350**
Recon Option	**Full**	**Full**	**Full**
Recon Option			
ASiR/ASiR256/DLIR	**None**	**None**	**None**
Slice Thickness (mm)	**2.5**	**2.5**	**2.5**
Interval (mm)	**N/A**	**N/A**	**N/A**
Recon 3 (Secondary)			
DFOV	**22**	**22**	**22**
Recon Type	**Soft**	**Soft**	**Soft**
WW/WL	**180/25**	**180/25**	**180/25**
Recon Option	**Full**	**Full**	**Full**
Recon Option			
ASiR/ASiR256/DLIR	**80% / 40% / High**	**80% / 40% / High**	**80% / 40% / High**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**N/A**	**N/A**	**N/A**

Series 3, Scan Phase

	Infant	Child	Adolescent
Scan Type	**Axial**	**Axial**	**Axial**
Beam Collimation	**10**	**10**	**10**
Detector Rows	**16.0**	**16.0**	**16.0**
Detector Configuration	**16x0.625**	**16x0.625**	**16x0.625**
Scan FOV	**Head**	**Head**	**Head**
Pitch	**1**	**1**	**1**
Speed (mm/rot)	**10.00**	**10.00**	**10.00**
Rotation Time (s)	**1**	**1**	**1**
kV	**80**	**80**	**100**
AEC type	**Manual mA**	**Manual mA**	**Manual mA**
mA Range	**(120-400)**	**(150-400)**	**(150-480)**
Manual mA	**290.0**	**380.0**	**380.0**
Noise Index	**3.9**	**4.6**	**4.4**
Slice Thickness (mm)	**5**	**5**	**5**
Interval (mm)	**10**	**10**	**10**

Series 3, Recons

	Infant	Child	Adolescent
Recon 1 (Primary)			
DFOV	**22**	**22**	**22**
Recon Type	**Soft**	**Soft**	**Soft**
WW/WL	**80/25**	**80/25**	**80/25**
Recon Option	**Full**	**Full**	**Full**
Recon Option			
ASiR/ASiR256/DLIR	**60% / 30% / High**	**60% / 30% / High**	**60% / 30% / High**
Slice Thickness (mm)	**5.0**	**5.0**	**5.0**
Interval (mm)	**N/A**	**N/A**	**N/A**
Recon 2 (Secondary)			
DFOV	**22**	**22**	**22**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**2500/350**	**2500/350**	**2500/350**
Recon Option	**Full**	**Full**	**Full**
Recon Option			
ASiR/ASiR256/DLIR	**None**	**None**	**None**
Slice Thickness (mm)	**2.5**	**2.5**	**2.5**
Interval (mm)	**N/A**	**N/A**	**N/A**
Recon 3 (Secondary)			
DFOV	**22**	**22**	**22**
Recon Type	**Soft**	**Soft**	**Soft**
WW/WL	**180/25**	**180/25**	**180/25**
Recon Option	**Full**	**Full**	**Full**
Recon Option			
ASiR/ASiR256/DLIR	**80% / 40% / High**	**80% / 40% / High**	**80% / 40% / High**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**N/A**	**N/A**	**N/A**

3D CT (Craniosynostosis, Congenital Facial Anomaly) 11.13/11.14/11.15

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Indication

Craniosynostosis, Cleft lip, Cleft Palate, septo-optic dysplasia

Oral Contrast

None

Pre-Scan Instructions

- Patient Supine, PA and lateral scouts, no gantry angle
- Remove all metallic and high-density objects from the scanning area.
- Patient Positioning: Tilt the patient's head so that a line connecting the lateral canthus and the EAC is perpendicular to the CT tabletop. (see head CT protocol)

IV Contrast Parameters

Only done without contrast.

Field of View

Preferred 22 cm (Must include the entire head, face, and mandible)

Scan Description

- Series 1 – Scouts PA and Lateral
- Series 2 – Crainio: Start just below the mandible and scan all the way through the top of the head (Get 1-2 air scans above the head and below the chin to allow the 3D program to show the entire head and mandible without artifacts)

Reformat Instructions

No reformats unless requested by a Radiologist

Reformats

None.

Networking

- All Images to PACS (ALI_Store).
- Note: if smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

Miscellaneous

Choose the CT scan factors on the scanner for the proper age range of the patient:

- Adult: (>= 18 years)

- Adolescent: (7 - 17 years)
- Child: (3 – 6 years)
- Infant: (0 – 2 years)

Acquisition Parameters

Series 1, Scout

	Infant	Child	Adolescent
Scout 1 kV	**80**	**100**	**120**
Scout 1 mA	**10**	**10**	**10**
Scout 1 Angle	**180**	**180**	**180**
Scout 2 kV	**80**	**100**	**120**
Scout 2 mA	**20**	**20**	**20**
Scout 2 Angle	**90**	**90**	**90**
WW/WL for Scout	**500/50**	**500/50**	**500/50**

Series 2, Scan Phase

	Infant	Child	Adolescent
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**20**	**20**	**20**
Detector Rows	**32.0**	**32.0**	**32.0**
Detector Configuration	**32x0.625**	**32x0.625**	**32x0.625**
Scan FOV	**Head**	**Head**	**Head**
Pitch	**0.531**	**0.531**	**0.531**
Speed (mm/rot)	**10.60**	**10.60**	**10.60**
Rotation Time (s)	**0.5**	**0.5**	**0.5**
kV	**80**	**100**	**120**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(130-400)**	**(130-440)**	**(130-440)**
Manual mA	**210.0**	**210.0**	**210.0**
Noise Index	**3.4**	**3.4**	**3.4**
Slice Thickness (mm)	**5**	**5**	**5**
Interval (mm)	**3.0**	**3.0**	**3.0**

Series 2, Recons

	Infant	Child	Adolescent
Recon 1 (Primary)			
DFOV	**22**	**22**	**22**
Recon Type	**Soft**	**Soft**	**Soft**
WW/WL	**80/25**	**80/25**	**80/25**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option			
ASiR/ASiR256/DLIR	**60% / 30% / Medium**	**60% / 30% / Medium**	**60% / 30% / Medium**
Slice Thickness (mm)	**5.0**	**5.0**	**5.0**
Interval (mm)	**3.0**	**3.0**	**3.0**
Recon 2 (Secondary)			
DFOV	**22**	**22**	**22**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**2500/350**	**2500/350**	**2500/350**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option			
ASiR/ASiR256/DLIR	**None**	**None**	**None**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**
Recon 3 (Secondary)			
DFOV	**22**	**22**	**22**
Recon Type	**Soft**	**Soft**	**Soft**
WW/WL	**180/25**	**180/25**	**180/25**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**80% / 40% / High**	**80% / 40% / High**	**80% / 40% / High**
Slice Thickness (mm)	**0.625**	**0.625**	**0.625**
Interval (mm)	**0.312**	**0.312**	**0.312**

16 & 32 Slice Scanner Exceptions:

1. The 0.625mm slice thickness x 0.312mm interval Recon should be 1.25mm slice thickness x 0.625mm interval on 16 and 32 slice CT scanners. The 16 and 32 slice scanners are only able to recon down to 0.625mm slice thickness when using 10mm and/or 20mm beam collimation respectively. However, when using 20mm and/or 40mm beam collimation, they are only capable of reconstructing to 1.25mm slice thickness.
2. MARS feature is not an option.
3. IQ Enhance feature requires thin slices (1.25mm or less) with an interval of half (or less). On older scanner models, in order to enable IQ Enhance at 0.625 mm slice thickness, the interval must be set to 0.311 mm instead of 0.312 mm.

DLIR Limitations:

1. DLIR is not available on the Primary Recon.
2. DLIR is only compatible with the Standard Algorithm. So, in instances where the primary recon is Soft algorithm,(i.e. many Neuro Protocols) the subsequent recons will be in Standard Algorithm to enable DLIR. The slight difference between the Soft and Standard Algorithms is outweighed by the improvement in image quality with DLIR enabled.
3. DLIR requires an interval exactly half of the slice thickness.
4. DLIR doesn't allow an interval of 0.312 mm. So, if you are on a DLIR enabled scanner, the thin 0.625 recon will be at 0.625x0.625 mm. On all other scanners the thin recon will be at 0.625x0.312 mm.

Peds Stroke Deluxe – Total Cerebrovascular 11.16/11.17/11.18

If you get an order for Perfusion only, please still scan the Without contrast and With contrast Head along with the Perfusion. Skip the CTA Head/Neck series.

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Indication

Stroke, mental status change, dissection, arterial embolism

Videos for this protocol

Stroke Deluxe

Perfusion

Oral Contrast

None

Pre-Scan Instructions

- Start an 18g right sided IV. If it is a stroke code and an IV is already placed, please do not re-stick the patient.
- Extend the scouts to include the aortic arch for smart prep.
- Patient Positioning: Tilt the patient's head so that a line connecting the lateral canthus of the eye and the EAC is perpendicular to the CT tabletop (see head CT protocol).
- Remove all metallic and high-density objects from the scanning area.

IV Contrast Parameters 350

Pediatrics CTA

Weight Ranges	Contrast Dosage	Injection Rate
0-87 kgs (0-191 lbs)	1.5 mL/kg (~0.75mL/lb) of Iohexol 350 mgI/mL + 10 mL NaCl flush	2 mL/sec

Neuro Pediatric CTA Perfusion Phase

Weight Ranges	Contrast Dosage	Injection Rate
0-87 kgs (0-191 lbs)	0.5 mL/kg (~0.25mL/lb) Iohexol 350 mgI/mL + 10 mL NaCl flush	3- 4 mL/sec
Administer Contrast Dose according to patient's weight in kg whenever possible.		
Injection Rate variable, depending on the size of patient and IV guage.		

IV Contrast Parameters 300/370

Pediatrics CTA

Weight Ranges	Contrast Dosage	Injection Rate
0-80 kgs (0-175 lbs)	1.5 mL/kg (~0.75mL/lb) of Iopamidol 370 mgI/mL (Isovue) + 10 mL NaCl flush	2 mL/sec

Neuro Pediatric CTA Perfusion Phase

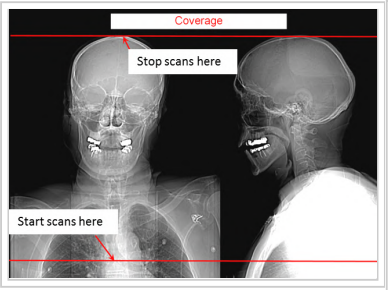
Weight Ranges	Contrast Dosage	Injection Rate
0-80 kgs (0-175 lbs)	0.5 mL/kg (~0.25mL/lb) Iopamidol 370 mgI/mL (Isovue) + 10 mL NaCl flush	3- 4 mL/sec
Administer Contrast Dose according to patient's weight in kg whenever possible.		
Injection Rate variable, depending on the size of patient and IV guage.		

Field of View

Preferred 22 cm

Scan Description

- **Series 1** – Scouts PA and Lateral
- **Series 2** – Routine CT Head without contrast (Helical)
- **Series 3** - CTA Head and Neck: Scan from bottom of carina to the top of head (bottom up)
  - Smart Prep: Aortic arch (initiate the scan at contrast entry)

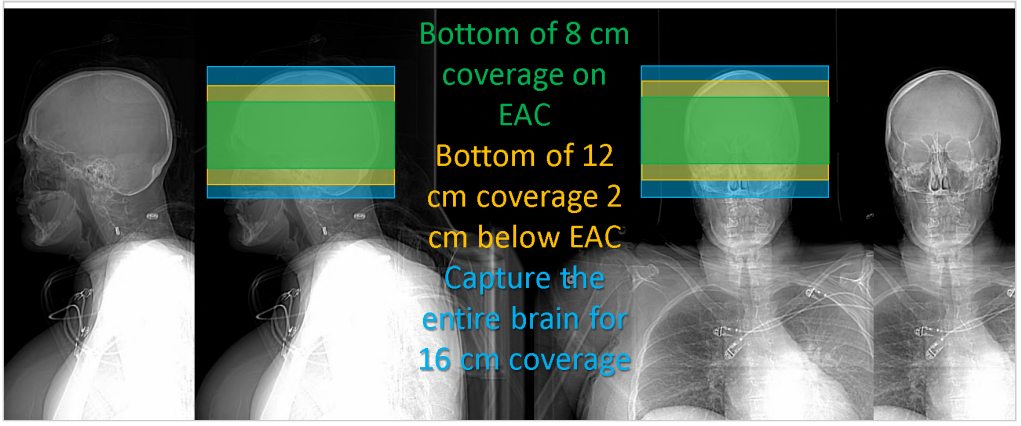


- **Series 4** – CT Perfusion: Peds Coverage - Depends on patient size. (80+mm of coverage can be too much for small patients.)
  - Infant: 40mm axial coverage (see perfusion levels in the supplemental perfusion information. See perfusion appendix page)
  - Child: 40mm axial coverage (see perfusion levels in the supplemental perfusion information. See perfusion appendix page)
  - Adolescent: Shuttle perfusion if scanner allows, bottom of scan range should start at the EAC. If your scanner does not offer Shuttle Perfusion Mode, use 40mm axial coverage (for larger pediatric patients, you may need to acquire two 40mm perfusion levels- see perfusion appendix page)

When to Scan Perfusion Series	
Scenario	Delay
If a Stroke Code:	Wait 30 seconds after CTA to begin
If a Non-Emergent case:	Wait 5 mins from start of CTA injection

- **Series 5** – Routine Head With contrast (Helical): Must be done AFTER perfusion. Delay allows more enhancement of lesions, but this is out-weighed by the necessity for urgency in a Stroke Code.

When to Scan Head with Series	
Scenario	**Delay**
If a Stroke Code:	**Start immediately after perfusion**
If a Non-Emergent case:	**Start immediately after perfusion**
If Stroke Code (no perfusion):	**Start 30 seconds after CTA injection**
If Non- Emergent (no perfusion):	**Wait 5 mins from start of CTA injection**



Perfusion Coverage Guidance. If a "whole brain" coverage is ordered, use the 16 cm coverage. Note, on non Rev256 scanners, you will only have 8 cm of coverage (i.e. shuttle mode). All three protocols will have the same scan time, approximately 60 seconds. 80 mm coverage = 352 images, 120 mm coverage = 528 images and 160 mm coverage = 704 images.

Reformat Instructions

Please send all images to PACS before starting reformats. See table below for reformat instructions.

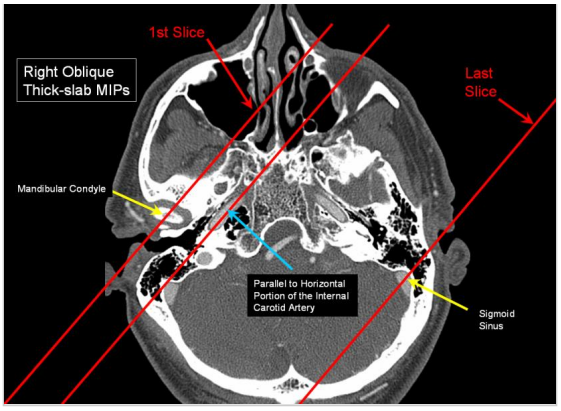
In the United States, CT Angiography CPT codes require the performance and documentation of 3D angiographic rendering, which may include maximum intensity projection (MIP), volumetric rendering, and/or surface rendering techniques.

Reformats

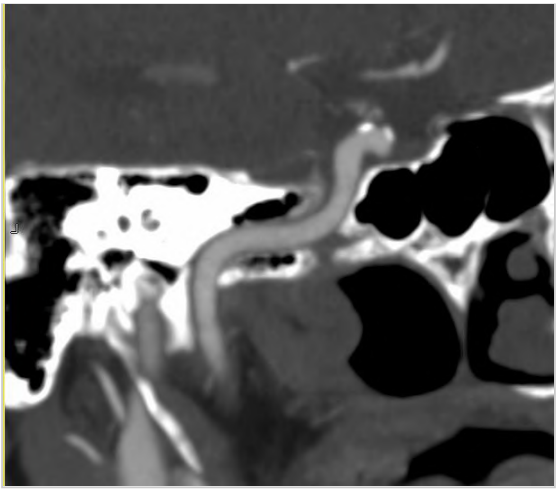
Thin MIP 2D-Reformations through the vertebral and carotid arteries

- Make sure the reference line is parallel to the carotid canal (see image below)
- Axial images to use for obtaining the oblique sagittal 2-D Reformations
- Use a DFOV of 10

Send to ALI Store (PACS)



Where to take reformats



What reformats should look like

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
RT OBL	Thin ST	Manual	MIP	800/200	1	1	Axial
LT OBL	Thin ST	Manual	MIP	800/200	1	1	Axial

2D Thick-Slab MIP Reformats of Head

- Do axial, sagittal, and coronal thick-slab MIPs through the entire head. (See examples below)

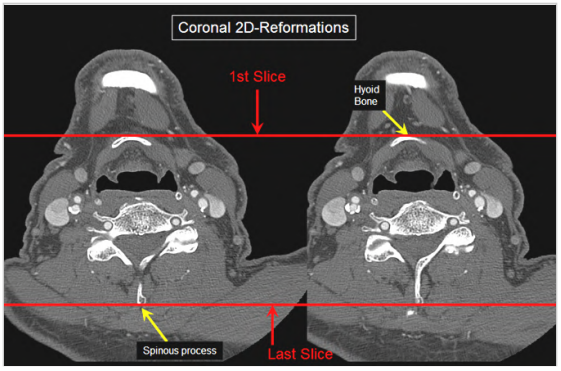
Send to ALI Store (PACS).

What reformats should look like

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
AX	Thin ST	Manual	MIP	600/200	10	2.5	axial
SA	Thin ST	Manual	MIP	600/200	10	2.5	sagittal
CO	Thin ST	Manual	MIP	600/200	10	2.5	coronal

2D MIP-Reformations through the vertebral and carotid arteries

- Use an axial image near the level of the hyoid bone at the carotid bifurcation to prescribe the correct oblique angles. Use an image that shows the external and internal carotid arteries.
- Choose only the axial images from the aortic arch to the EAC.
- Include both the carotid and vertebral arteries (See example below)
- Send all images to ALI Store(PACS).



Coronal and Sagittal 2D- MIP Reformats
Through Carotid Bifurcations

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
SA	Thin ST	Manual	MIP	800/200	10	2.5	sagittal
CO	Thin ST	Manual	MIP	800/200	10	2.5	coronal
SA ST	Thin ST	Manual	Average	300/35	3	1.5	Sagittal

Networking

- All Images to PACS (ALI_Store).
- Thin ST CTA is auto-networked to CTAW1/ 3D lab.
- Perfusion is set up to auto send to RAPID (outside facilities send to your own stroke processing software solution).
- Do not wait until the end of the exam to start sending images to PACS if the case is emergent, please send series as soon as they are reconstructed and send images as you reformat them to get the stroke care team images asap.
- Note: if smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

All MAR recons and reformats should be sent to PACS (ALI_Store). Label MAR reformats with the word "MAR" at the end, for example "CO ST MAR".

Miscellaneous

Choose the CT scan factors on the scanner for the proper age range of the patient:

- Adult: (>= 18 years)
- Adolescent: (7 - 17 years)
- Child: (3 – 6 years)
- Infant: (0 – 2 years)

Acquisition Parameters

Series 1, Scout

	Infant	Child	Adolescent
Scout 1 kV	80	100	120
Scout 1 mA	10	10	10
Scout 1 Angle	180	180	180
Scout 2 kV	80	100	120
Scout 2 mA	20	20	20
Scout 2 Angle	90	90	90
WW/WL for Scout	500/50	500/50	500/50

Series 2, Scan Phase

	Infant	Child	Adolescent
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**20**	**20**	**20**
Detector Rows	**32.0**	**32.0**	**32.0**
Detector Configuration	**32x0.625**	**32x0.625**	**32x0.625**
Scan FOV	**Head**	**Head**	**Head**
Pitch	**0.531**	**0.531**	**0.531**
Speed (mm/rot)	**10.60**	**10.60**	**10.60**
Rotation Time (s)	**0.5**	**0.5**	**0.5**
kV	**80**	**100**	**120**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(130-400)**	**(130-440)**	**(130-440)**
Manual mA	**210.0**	**210.0**	**210.0**
Noise Index	**3.4**	**3.4**	**3.4**
Slice Thickness (mm)	**5**	**5**	**5**
Interval (mm)	**3.0**	**3.0**	**3.0**

Series 2, Recons

	Infant	Child	Adolescent
Recon 1 (Primary)			
DFOV	**22**	**22**	**22**
Recon Type	**Soft**	**Soft**	**Soft**
WW/WL	**80/25**	**80/25**	**80/25**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option			
ASiR/ASiR256/DLIR	**60% / 30% / Medium**	**60% / 30% / Medium**	**60% / 30% / Medium**
Slice Thickness (mm)	**5.0**	**5.0**	**5.0**
Interval (mm)	**3.0**	**3.0**	**3.0**
Recon 2 (Secondary)			
DFOV	**22**	**22**	**22**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**2500/350**	**2500/350**	**2500/350**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option			
ASiR/ASiR256/DLIR	**None**	**None**	**None**
Slice Thickness (mm)	**2.5**	**2.5**	**2.5**
Interval (mm)	**1.5**	**1.5**	**1.5**
Recon 3 (Secondary)			
DFOV	**22**	**22**	**22**
Recon Type	**Soft**	**Soft**	**Soft**
WW/WL	**180/25**	**180/25**	**180/25**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**80% / 40% / High**	**80% / 40% / High**	**80% / 40% / High**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Series 3, Smart Prep

	Infant	Child	Adolescent
mA	**40**	**40**	**80**
Monitoring Delay (sec)	**10**	**10**	**10**
Monitoring ISD (sec)	**2.0**	**2.0**	**2**
Enhancement Threshold (HU)	**40**	**40**	**40**
Diagnostic Delay	**Auto Minimum**	**Auto Minimum**	**Auto Minimum**

Series 3, Scan Phase

	Infant	Child	Adolescent
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**40**	**40**	**40**
Detector Rows	**64.0**	**64.0**	**64.0**
Detector Configuration	**64x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Medium Body**	**Medium Body**	**Large Body**
Pitch	**0.516**	**0.516**	**0.516**
Speed (mm/rot)	**20.60**	**20.60**	**20.60**
Rotation Time (s)	**0.5**	**0.5**	**0.5**
kV	**80**	**100**	**120**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(190-400)**	**(240-480)**	**(240-560)**
Manual mA	**400.0**	**480.0**	**410.0**
Noise Index	**9.6**	**11.3**	**11.3**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Series 3, Recons

	Infant	Child	Adolescent
Recon 1 (Primary)			
DFOV	**22**	**22**	**22**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**60% / 30% / High**	**60% / 30% / High**	**60% / 30% / High**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**
Recon 2 (Secondary)			
DFOV	**22**	**22**	**22**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**2500/350**	**2500/350**	**2500/350**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
Recon Option	**None**	**None**	**None**
ASiR/ASiR256/DLIR	**1.25**	**1.25**	**1.25**
Slice Thickness (mm)	**0.625**	**0.625**	**0.625**
Interval (mm)			
Recon 3 (Secondary)			
DFOV	**22**	**22**	**22**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
Recon Option	**MARS On**	**MARS On**	**MARS On**
ASiR/ASiR256/DLIR	**80% / 40% / High**	**80% / 40% / High**	**80% / 40% / High**
Slice Thickness (mm)	**0.625**	**0.625**	**0.625**
Interval (mm)	**0.312**	**0.312**	**0.312**

DLIR Limitations:

1. DLIR is not available on the Primary Recon.
2. DLIR is only compatible with the Standard Algorithm. So, in instances where the primary recon is Soft algorithm,(i.e. many Neuro Protocols) the subsequent recons will be in Standard Algorithm to enable DLIR. The slight difference between the Soft and Standard Algorithms is outweighed by the improvement in image quality with DLIR enabled.
3. DLIR requires an interval exactly half of the slice thickness.
4. DLIR doesn't allow an interval of 0.312 mm. So, if you are on a DLIR enabled scanner, the thin 0.625 recon will be at 0.625x0.625 mm. On all other scanners the thin recon will be at 0.625x0.312 mm.

16 & 32 Slice Scanner Exceptions:

1. The 0.625mm slice thickness x 0.312mm interval Recon should be 1.25mm slice thickness x 0.625mm interval on 16 and 32 slice CT scanners. The 16 and 32 slice scanners are only able to recon down to 0.625mm slice thickness when using 10mm and/or 20mm beam collimation respectively. However, when using 20mm and/or 40mm beam collimation, they are only capable of reconstructing to 1.25mm slice thickness.
2. MARS feature is not an option.
3. IQ Enhance feature requires thin slices (1.25mm or less) with an interval of half (or less). On older scanner models, in order to enable IQ Enhance at 0.625 mm slice thickness, the interval must be set to 0.311 mm instead of 0.312 mm.

Series 4, Perfusion

Perfusion Details can be found on the perfusion appendix page

Series 5, Scan Phase

	Infant	Child	Adolescent
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**20**	**20**	**20**
Detector Rows	**32.0**	**32.0**	**32.0**
Detector Configuration	**32x0.625**	**32x0.625**	**32x0.625**
Scan FOV	**Head**	**Head**	**Head**
Pitch	**0.531**	**0.531**	**0.531**
Speed (mm/rot)	**10.60**	**10.60**	**10.60**
Rotation Time (s)	**0.6**	**0.7**	**0.6**
kV	**80**	**80**	**100**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(110-370)**	**(110-390)**	**(130-450)**
Manual mA	**170.0**	**190.0**	**230.0**
Noise Index	**3.4**	**4.0**	**4.0**
Slice Thickness (mm)	**5**	**5**	**5**
Interval (mm)	**3.0**	**3.0**	**3.0**

Series 5, Recons

	Infant	Child	Adolescent
Recon 1 (Primary)			
DFOV	**22**	**22**	**22**
Recon Type	**Soft**	**Soft**	**Soft**
WW/WL	**80/25**	**80/25**	**80/25**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option			
ASiR/ASiR256/DLIR	**60% / 30% / Medium**	**60% / 30% / Medium**	**60% / 30% / Medium**
Slice Thickness (mm)	**5.0**	**5.0**	**5.0**
Interval (mm)	**3.0**	**3.0**	**3.0**

Peds CTA Head Only (Stenosis, Aneurysm, Unknown Bleed) 11.19/11.20/11.21

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Indication

Stenosis, Aneurysm, Unknown Bleed

(If an order is asking for both a CTA and a CTV, please scan only the CTV, do not scan both.)

Videos for this protocol

CTA Head and Neck

Perfusion

Oral Contrast

None

Pre-Scan Instructions

- Start an 18g right sided IV. If it is a stroke code and an IV is already placed, please do not re-stick the patient.
- Extend the scouts to include the aortic arch for smart prep.
- Patient Positioning: Tilt the patient's head so that a line connecting the lateral canthus of the eye and the EAC is perpendicular to the CT tabletop (see head CT protocol).
- Remove all metallic and high-density objects from the scanning area.

IV Contrast Parameters 350

Pediatrics CTA

Weight Ranges	Contrast Dosage	Injection Rate
0-87 kgs (0-191 lbs)	1.5 mL/kg (~0.75mL/lb) of Iohexol 350 mgI/mL + 10 mL NaCl flush	2 mL/sec

Neuro Pediatric CTA Perfusion Phase

Weight Ranges	Contrast Dosage	Injection Rate
0-87 kgs (0-191 lbs)	0.5 mL/kg (~0.25mL/lb) Iohexol 350 mgI/mL + 10 mL NaCl flush	3- 4 mL/sec
Administer Contrast Dose according to patient's weight in kg whenever possible.		
Injection Rate variable, depending on the size of patient and IV guage.		

IV Contrast Parameters 300/370

Pediatrics CTA

Weight Ranges	Contrast Dosage	Injection Rate
0-80 kgs (0-175 lbs)	1.5 mL/kg (~0.75mL/lb) of Iopamidol 370 mgI/mL (Isovue) + 10 mL NaCl flush	2 mL/sec

Neuro Pediatric CTA Perfusion Phase

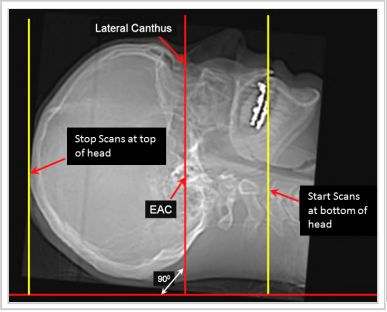
Weight Ranges	Contrast Dosage	Injection Rate
0-80 kgs (0-175 lbs)	0.5 mL/kg (~0.25mL/lb) Iopamidol 370 mgI/mL (Isovue) + 10 mL NaCl flush	3- 4 mL/sec
Administer Contrast Dose according to patient's weight in kg whenever possible.		
Injection Rate variable, depending on the size of patient and IV guage.		

Field of View

Preferred 22 cm

Scan Description

- **Series 1** – Scouts PA and Lateral
- **Series 2** – Routine CT Head without contrast (Helical)
- **Series 3** - CTA Head Only: Scan from bottom of C2 to the top of head (bottom up)
  - Smart Prep: Aortic arch (initiate the scan at contrast entry)

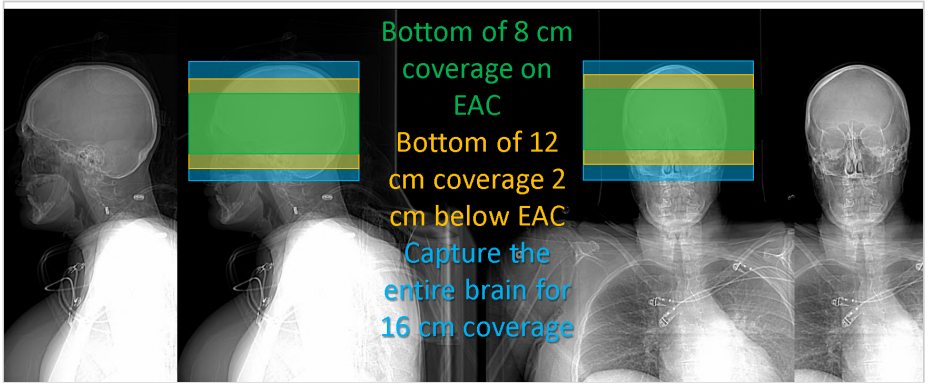


- **Series 4** – CT Perfusion: Peds Coverage - Depends on patient size. (80+mm of coverage can be too much for small patients.)
  - Infant: 40mm axial coverage (see perfusion levels in the supplemental perfusion information. See perfusion appendix page)
  - Child: 40mm axial coverage (see perfusion levels in the supplemental perfusion information. See perfusion appendix page)
  - Adolescent: Shuttle perfusion if scanner allows, bottom of scan range should start at the EAC. If your scanner does not offer Shuttle Perfusion Mode, use 40mm axial coverage (may need to acquire two 40mm perfusion levels- See perfusion appendix page)

When to Scan Perfusion Series	
Scenario	Delay
If a Stroke Code:	Wait 30 seconds after CTA to begin
If a Non-Emergent case:	Wait 5 mins from start of CTA injection

- **Series 5** – Routine Head With contrast (Helical): Must be done AFTER perfusion. Delay allows more enhancement of lesions, but this is out-weighed by the necessity for urgency in a Stroke Code.

When to Scan Head with Series	
Scenario	Delay
If a Stroke Code:	Start immediately after perfusion
If a Non-Emergent case:	Start immediately after perfusion
If Stroke Code (no perfusion):	Start 30 seconds after CTA injection
If Non- Emergent (no perfusion):	Wait 5 mins from start of CTA injection



Perfusion Coverage Guidance. If a "whole brain" coverage is ordered, use the 16 cm coverage. Note, on non Rev256 scanners, you will only have 8 cm of coverage (i.e. shuttle mode).

Reformat Instructions

Please send all images to PACS before starting reformats. See table below for reformat instructions.

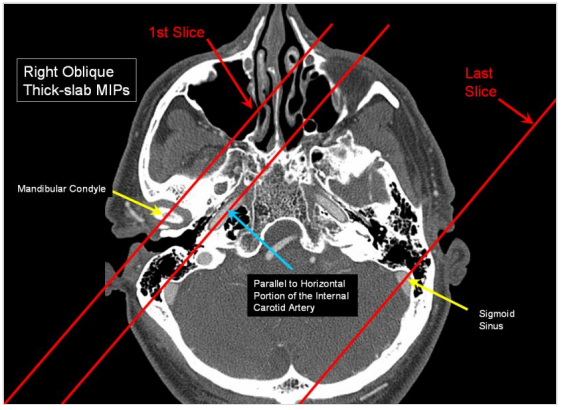
In the United States, CT Angiography CPT codes require the performance and documentation of 3D angiographic rendering, which may include maximum intensity projection (MIP), volumetric rendering, and/or surface rendering techniques.

Reformats

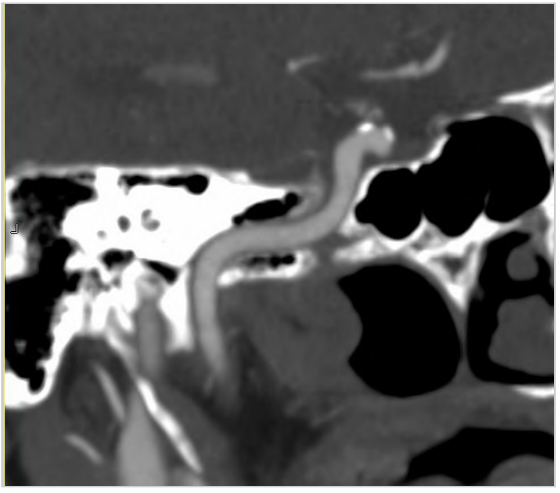
Thin MIP 2D-Reformations through the vertebral and carotid arteries

- Make sure the reference line is parallel to the carotid canal (see image below)
- Axial images to use for obtaining the oblique sagittal 2-D Reformations
- Use a DFOV of 10

Send to ALI Store (PACS)



Where to take reformats



What reformats should look like

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
RT OBL	Thin ST	Manual	MIP	800/200	1	1	Axial
LT OBL	Thin ST	Manual	MIP	800/200	1	1	Axial

2D Thick-Slab MIP Reformats of Head

Do axial, sagittal, and coronal thick-slab MIPs through the entire head. (See examples below)

Send to ALI Store (PACS).

What reformats should look like

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
AX	Thin ST	Manual	MIP	600/200	10	2.5	axial
SA	Thin ST	Manual	MIP	600/200	10	2.5	sagittal
CO	Thin ST	Manual	MIP	600/200	10	2.5	coronal

Networking

- All Images to PACS (ALI_Store).
- Thin ST CTA is auto-networked to CTAW1/ 3D lab.
- Perfusion is set up to auto send to RAPID (outside facilities send to your own stroke processing software solution).
- Do not wait until the end of the exam to start sending images to PACS if the case is emergent, please send series as soon as they are reconstructed and send images as you reformat them to get the stroke care team images asap.
- Note: if smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

All MAR recons and reformats should be sent to PACS (ALI_Store). Label MAR reformats with the word "MAR" at the end, for example "CO ST MAR".

Miscellaneous

Choose the CT scan factors on the scanner for the proper age range of the patient:

- Adult: (>= 18 years)
- Adolescent: (7 - 17 years)
- Child: (3 – 6 years)
- Infant: (0 – 2 years)

Acquisition Parameters

Series 1, Scout

	Infant	Child	Adolescent
Scout 1 kV	80	100	120
Scout 1 mA	10	10	10
Scout 1 Angle	180	180	180
Scout 2 kV	80	100	120
Scout 2 mA	20	20	20
Scout 2 Angle	90	90	90
WW/WL for Scout	500/50	500/50	500/50

Series 2, Scan Phase

	Infant	Child	Adolescent
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**20**	**20**	**20**
Detector Rows	**32.0**	**32.0**	**32.0**
Detector Configuration	**32x0.625**	**32x0.625**	**32x0.625**
Scan FOV	**Head**	**Head**	**Head**
Pitch	**0.531**	**0.531**	**0.531**
Speed (mm/rot)	**10.60**	**10.60**	**10.60**
Rotation Time (s)	**0.5**	**0.5**	**0.5**
kV	**80**	**100**	**120**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(130-400)**	**(130-440)**	**(130-440)**
Manual mA	**210.0**	**210.0**	**210.0**
Noise Index	**3.4**	**3.4**	**3.4**
Slice Thickness (mm)	**5**	**5**	**5**
Interval (mm)	**3.0**	**3.0**	**3.0**

Series 2, Recons

	Infant	Child	Adolescent
Recon 1 (Primary)			
DFOV	**22**	**22**	**22**
Recon Type	**Soft**	**Soft**	**Soft**
WW/WL	**80/25**	**80/25**	**80/25**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option			
ASiR/ASiR256/DLIR	**60% / 30% / Medium**	**60% / 30% / Medium**	**60% / 30% / Medium**
Slice Thickness (mm)	**5.0**	**5.0**	**5.0**
Interval (mm)	**3.0**	**3.0**	**3.0**
Recon 2 (Secondary)			
DFOV	**22**	**22**	**22**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**2500/350**	**2500/350**	**2500/350**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option			
ASiR/ASiR256/DLIR	**None**	**None**	**None**
Slice Thickness (mm)	**2.5**	**2.5**	**2.5**
Interval (mm)	**1.5**	**1.5**	**1.5**
Recon 3 (Secondary)			
DFOV	**22**	**22**	**22**
Recon Type	**Soft**	**Soft**	**Soft**
WW/WL	**180/25**	**180/25**	**180/25**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**80% / 40% / High**	**80% / 40% / High**	**80% / 40% / High**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Series 3, Smart Prep

	Infant	Child	Adolescent
mA	**40**	**40**	**80**
Monitoring Delay (sec)	**10**	**10**	**10**
Monitoring ISD (sec)	**2.0**	**2.0**	**2**
Enhancement Threshold (HU)	**40**	**40**	**40**
Diagnostic Delay	**Auto Minimum**	**Auto Minimum**	**Auto Minimum**

Series 3, Scan Phase

	Infant	Child	Adolescent
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**20**	**20**	**20**
Detector Rows	**32.0**	**32.0**	**32.0**
Detector Configuration	**32x0.625**	**32x0.625**	**32x0.625**
Scan FOV	**Head**	**Head**	**Head**
Pitch	**0.531**	**0.531**	**0.531**
Speed (mm/rot)	**10.60**	**10.60**	**10.60**
Rotation Time (s)	**0.6**	**0.7**	**0.6**
kV	**80**	**80**	**100**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(110-370)**	**(110-390)**	**(130-450)**
Manual mA	**170.0**	**190.0**	**230.0**
Noise Index	**6.8**	**8.0**	**8.0**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Series 3, Recons

	Infant	Child	Adolescent
Recon 1 (Primary)			
DFOV	**22**	**22**	**22**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**60% / 30% / High**	**60% / 30% / High**	**60% / 30% / High**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**
Recon 2 (Secondary)			
DFOV	**22**	**22**	**22**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**2500/350**	**2500/350**	**2500/350**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**	**None**	**None**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**
Recon 3 (Secondary)			
DFOV	**22**	**22**	**22**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**80% / 40% / High**	**80% / 40% / High**	**80% / 40% / High**
Slice Thickness (mm)	**0.625**	**0.625**	**0.625**
Interval (mm)	**0.312**	**0.312**	**0.312**

DLIR Limitations:

1. DLIR is not available on the Primary Recon.
2. DLIR is only compatible with the Standard Algorithm. So, in instances where the primary recon is Soft algorithm,(i.e. many Neuro Protocols) the subsequent recons will be in Standard Algorithm to enable DLIR. The slight difference between the Soft and Standard Algorithms is outweighed by the improvement in image quality with DLIR enabled.
3. DLIR requires an interval exactly half of the slice thickness.
4. DLIR doesn't allow an interval of 0.312 mm. So, if you are on a DLIR enabled scanner, the thin 0.625 recon will be at 0.625x0.625 mm. On all other scanners the thin recon will be at 0.625x0.312 mm.

16 & 32 Slice Scanner Exceptions:

1. The 0.625mm slice thickness x 0.312mm interval Recon should be 1.25mm slice thickness x 0.625mm interval on 16 and 32 slice CT scanners. The 16 and 32 slice scanners are only able to recon down to 0.625mm slice thickness when using 10mm and/or 20mm beam collimation respectively. However, when using 20mm and/or 40mm beam collimation, they are only capable of reconstructing to 1.25mm slice thickness.
2. MARS feature is not an option.
3. IQ Enhance feature requires thin slices (1.25mm or less) with an interval of half (or less). On older scanner models, in order to enable IQ Enhance at 0.625 mm slice thickness, the interval must be set to 0.311 mm instead of 0.312 mm.

Series 4, Perfusion

Perfusion Details can be found on the perfusion appendix page

Series 5, Scan Phase

	Infant	Child	Adolescent
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**20**	**20**	**20**
Detector Rows	**32.0**	**32.0**	**32.0**
Detector Configuration	**32x0.625**	**32x0.625**	**32x0.625**
Scan FOV	**Head**	**Head**	**Head**
Pitch	**0.531**	**0.531**	**0.531**
Speed (mm/rot)	**10.60**	**10.60**	**10.60**
Rotation Time (s)	**0.6**	**0.7**	**0.6**
kV	**80**	**80**	**100**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(110-370)**	**(110-390)**	**(130-450)**
Manual mA	**170.0**	**190.0**	**230.0**
Noise Index	**3.4**	**4.0**	**4.0**
Slice Thickness (mm)	**5**	**5**	**5**
Interval (mm)	**3.0**	**3.0**	**3.0**

Series 5, Recons

	Infant	Child	Adolescent
Recon 1 (Primary)			
DFOV	**22**	**22**	**22**
Recon Type	**Soft**	**Soft**	**Soft**
WW/WL	**80/25**	**80/25**	**80/25**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option			
ASiR/ASiR256/DLIR	**60% / 30% / Medium**	**60% / 30% / Medium**	**60% / 30% / Medium**
Slice Thickness (mm)	**5.0**	**5.0**	**5.0**
Interval (mm)	**3.0**	**3.0**	**3.0**

Peds CTA Neck Only (Cerebrovascular Disease) 11.22/11.23/11.24

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Indication

Carotid Stenosis, Vertebral stenosis, dissection, trauma, hemorrhage

Video for this protocol

Oral Contrast

None

Pre-Scan Instructions

- Start an 18g right sided IV. If it is a stroke code and an IV is already placed, please do not re-stick the patient.
- Extend the scouts to include the aortic arch for smart prep.
- Patient Positioning: Tilt the patient's head so that a line connecting the lateral canthus of the eye and the EAC is perpendicular to the CT tabletop (see head CT protocol).
- Remove all metallic and high-density objects from the scanning area.

IV Contrast Parameters 350

Pediatrics CTA

Weight Ranges	Contrast Dosage	Injection Rate
0-80 kgs (0-175 lbs)	1.1 mL/kg of Iohexol 350 mgI/mL + 10 mL NaCl flush	2 mL/sec

IV Contrast Parameters 300/375

Pediatrics CTA

Weight Ranges	Contrast Dosage	Injection Rate
0-80 kgs (0-175 lbs)	1 mL/kg (~0.5 mL/lb) of Iopamidol 370 mgI/mL (Isovue) + 10 mL NaCl flush	2 mL/sec

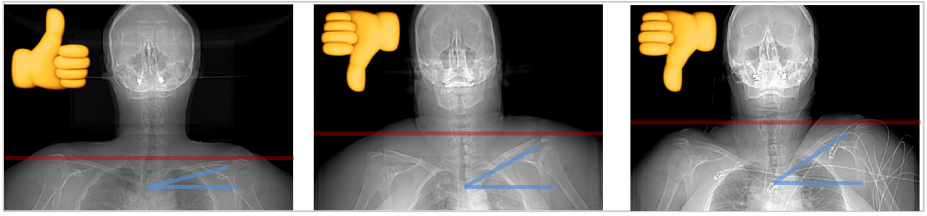
Field of View

Preferred 22 cm

Scan Description

- **Series 1** – Scouts PA and Lateral
- **Series 2** - CTA Neck Only: Scan from Carina and end at EAC (bottom to top.)
  - Smart Prep: place ROI on aortic arch (initiate the scan at contrast entry)

- **Series 3** - Optional - **For patients needing a Delay Routine CT Neck after the CTA Neck use the Routine CT neck protocol and obtain the scan at 80 seconds from the start of the contrast injection.**



Examples of good and bad shoulder position relative to the neck. The techniques listed above can get a patient from having a poor positioning of the shoulder to a good position. Note: try to recognize improper shoulder relaxation before you scout. If, however, you only notice this after you scout, there is no need to re-scout the patient after they move their shoulders.

Reformat Instructions

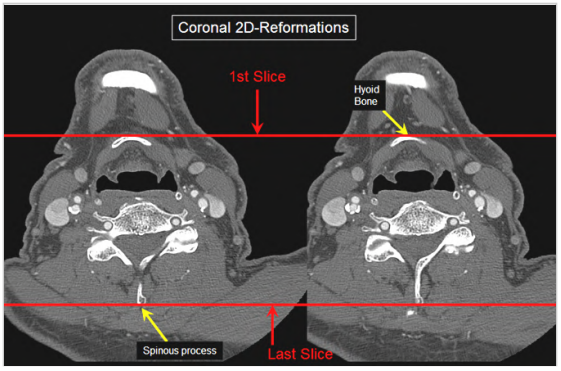
Please send all images to PACS before starting reformats. See table below for reformat instructions.

In the United States, CT Angiography CPT codes require the performance and documentation of 3D angiographic rendering, which may include maximum intensity projection (MIP), volumetric rendering, and/or surface rendering techniques.

Reformats

2D MIP-Reformations through the vertebral and carotid arteries

- Use an axial image near the level of the hyoid bone at the carotid bifurcation to prescribe the correct oblique angles. Use an image that shows the external and internal carotid arteries.
- Choose only the axial images from the aortic arch to the EAC.
- Include both the carotid and vertebral arteries (See example below)
- Send all images to ALI Store (PACS).



Coronal and Sagittal 2D- MIP Reformats
Through Carotid Bifurcations

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
SA	Thin ST	Manual	MIP	800/200	10	2.5	sagittal
CO	Thin ST	Manual	MIP	800/200	10	2.5	coronal
SA ST	Thin ST	Manual	Average	300/35	3	1.5	Sagittal

Networking

- All Images to PACS (ALI_Store).
- Note: if smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

All MAR recons and reformats should be sent to PACS (ALI_Store). Label MAR reformats with the word "MAR" at the end, for example "CO ST MAR".

Miscellaneous

Choose the CT scan factors on the scanner for the proper age range of the patient:

- Adult: (>= 18 years)
- Adolescent: (7 - 17 years)
- Child: (3 – 6 years)
- Infant: (0 – 2 years)

Acquisition Parameters

Series 1, Scout

	Infant	Child	Adolescent
Scout 1 kV	80	100	120
Scout 1 mA	10	10	10
Scout 1 Angle	180	180	180
Scout 2 kV	80	100	120
Scout 2 mA	20	20	20
Scout 2 Angle	90	90	90
WW/WL for Scout	500/50	500/50	500/50

Series 2, Smart Prep

	Infant	Child	Adolescent
mA	**40**	**40**	**80**
Monitoring Delay (sec)	**10**	**10**	**10**
Monitoring ISD (sec)	**2.0**	**2.0**	**2**
Enhancement Threshold (HU)	**40**	**40**	**40**
Diagnostic Delay	**Auto Minimum**	**Auto Minimum**	**Auto Minimum**

Series 2, Scan Phase

	Infant	Child	Adolescent
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**40**	**40**	**40**
Detector Rows	**64.0**	**64.0**	**64.0**
Detector Configuration	**64x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Medium Body**	**Medium Body**	**Large Body**
Pitch	**0.516**	**0.516**	**0.516**
Speed (mm/rot)	**20.60**	**20.60**	**20.60**
Rotation Time (s)	**0.5**	**0.5**	**0.5**
kV	**80**	**100**	**120**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(190-400)**	**(240-480)**	**(240-560)**
Manual mA	**400.0**	**480.0**	**410.0**
Noise Index	**9.6**	**11.3**	**11.3**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

16 & 32 Slice Scanner Exceptions:

1. The 0.625mm slice thickness x 0.312mm interval Recon should be 1.25mm slice thickness x 0.625mm interval on 16 and 32 slice CT scanners. The 16 and 32 slice scanners are only able to recon down to 0.625mm slice thickness when using 10mm and/or 20mm beam collimation respectively. However, when using 20mm and/or 40mm beam collimation, they are only capable of reconstructing to 1.25mm slice thickness.
2. MARS feature is not an option.
3. IQ Enhance feature requires thin slices (1.25mm or less) with an interval of half (or less). On older scanner models, in order to enable IQ Enhance at 0.625 mm slice thickness, the interval must be set to 0.311 mm instead of 0.312 mm.

Series 2, Recons

	Infant	Child	Adolescent
Recon 1 (Primary)			
DFOV	**22**	**22**	**22**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**60% / 30% / High**	**60% / 30% / High**	**60% / 30% / High**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**
Recon 2 (Secondary)			
DFOV	**22**	**22**	**22**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**2500/350**	**2500/350**	**2500/350**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**	**None**	**None**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**
Recon 3 (Secondary)			
DFOV	**22**	**22**	**22**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
Recon Option	**MARS On**	**MARS On**	**MARS On**
ASiR/ASiR256/DLIR	**60% / 30% / High**	**60% / 30% / High**	**60% / 30% / High**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Peds CT Venography Head & Neck 11.25/11.26/11.27

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Indication

Venous Sinus Thrombosis

If an order is asking for both a CTA and a CTV, please scan only the CTV, do not scan both.

Oral Contrast

None

Pre-Scan Instructions

- Extend the scouts to include the aortic arch for smart prep.
- Patient Positioning: Tilt the patient's head so that a line connecting the lateral canthus of the eye and the EAC is perpendicular to the CT tabletop (see head CT protocol).
- Remove all metallic and high-density objects from the scanning area.

IV Contrast Parameters 350

Pediatrics

Weight Ranges	Contrast Dosage	Injection Rate
0-80 kgs (0-175 lbs)	1 mL/kg (0.7 mL/lbs) Iohexol 350 mgI/mL 25 mL NaCl flush	Contrast: 2 mL/s NaCl flush: 1.5 mL/s

IV Contrast Parameters 300/370

Pediatrics

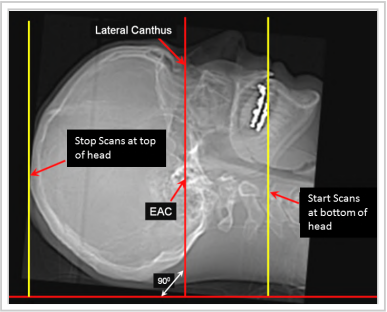
Weight Ranges	Contrast Dosage	Injection Rate
0-80 kgs (0-175 lbs)	1.5 mL/kg (0.7 mL/lbs) Iohexol 300 mgI/mLs 25 mL NaCl flush	Contrast: 2 mL/s NaCl flush: 1.5 mL/s

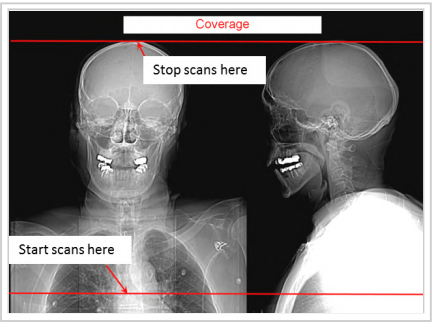
Field of View

Preferred 22 cm

Scan Description

- **Series 1** – Scouts PA and Lateral
- **Series 2** – Routine CT Head without contrast (Helical)
- **Series 3** - CTV Head Only -OR- CTV Head and Neck
- CTV Head Only: Scan from bottom of C2 to the top of head (bottom up)
- CTV Head and Neck: Scan from carina to top of head (bottom up)
    - Timing: There is a 7 second diagnostic delay built into the smart prep.
    - Smart Prep: Place ROI on aortic arch





- **Series 4** – Routine Head With contrast (Helical): Wait at least 5 min from start of CTV contrast injection before beginning scan.

Reformat Instructions

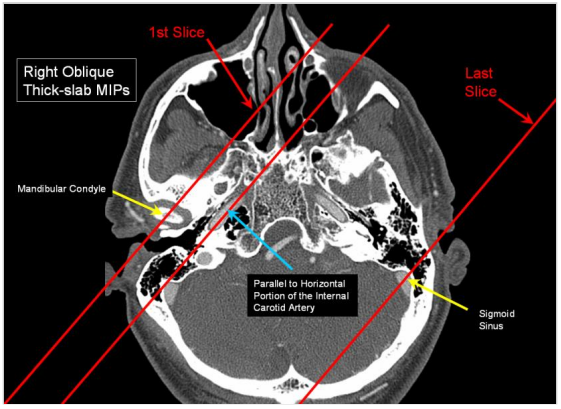
Please send all images to PACS before starting reformats. See table below for reformat instructions.

Reformats

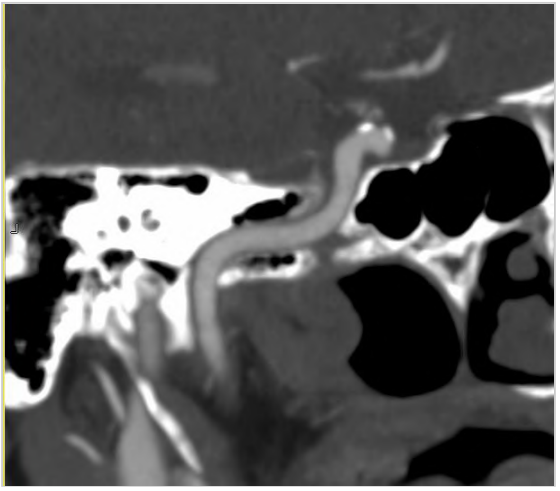
Thin MIP 2D-Reformations through the vertebral and carotid arteries

- Make sure the reference line is parallel to the carotid canal (see image below)
- Axial images to use for obtaining the oblique sagittal 2-D Reformations
- Use a DFOV of 10

Send to ALI Store (PACS)



Where to take reformats



What reformats should look like

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
RT OBL	Thin ST	Manual	MIP	800/200	1	1	Axial
LT OBL	Thin ST	Manual	MIP	800/200	1	1	Axial

2D Thick-Slab MIP Reformats of Head

- Do axial, sagittal, and coronal thick-slab MIPs through the entire head. (See examples below)

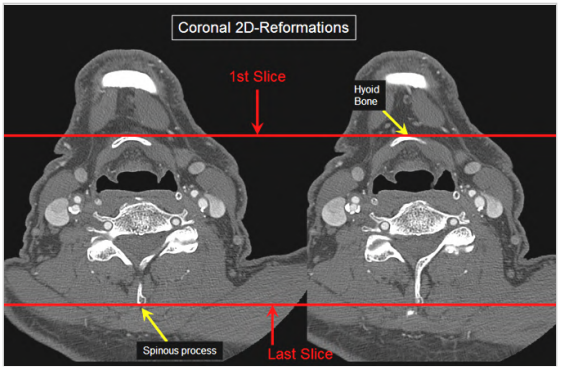
Send to ALI Store (PACS).

What reformats should look like

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
AX	Thin ST	Manual	MIP	600/200	10	2.5	axial
SA	Thin ST	Manual	MIP	600/200	10	2.5	sagittal
CO	Thin ST	Manual	MIP	600/200	10	2.5	coronal

2D MIP-Reformations through the vertebral and carotid arteries

- Use an axial image near the level of the hyoid bone at the carotid bifurcation to prescribe the correct oblique angles. Use an image that shows the external and internal carotid arteries.
- Choose only the axial images from the aortic arch to the EAC.
- Include both the carotid and vertebral arteries (See example below)
- Send all images to ALI Store(PACS).



Coronal and Sagittal 2D- MIP Reformats
Through Carotid Bifurcations

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
SA	Thin ST	Manual	MIP	800/200	10	2.5	sagittal
CO	Thin ST	Manual	MIP	800/200	10	2.5	coronal
SA ST	Thin ST	Manual	Average	300/35	3	1.5	Sagittal

Networking

- All Images to PACS (ALI_Store).
- Note: if smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

All MAR recons and reformats should be sent to PACS (ALI_Store). Label MAR reformats with the word "MAR" at the end, for example "CO ST MAR".

Miscellaneous

Choose the CT scan factors on the scanner for the proper age range of the patient:

- Adult: (>= 18 years)
- Adolescent: (7 - 17 years)
- Child: (3 – 6 years)
- Infant: (0 – 2 years)

Acquisition Parameters

Series 1, Scout

	Infant	Child	Adolescent
Scout 1 kV	80	100	120
Scout 1 mA	10	10	10
Scout 1 Angle	180	180	180
Scout 2 kV	80	100	120
Scout 2 mA	20	20	20
Scout 2 Angle	90	90	90
WW/WL for Scout	500/50	500/50	500/50

Series 2, Scan Phase

	Infant	Child	Adolescent
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**20**	**20**	**20**
Detector Rows	**32.0**	**32.0**	**32.0**
Detector Configuration	**32x0.625**	**32x0.625**	**32x0.625**
Scan FOV	**Head**	**Head**	**Head**
Pitch	**0.531**	**0.531**	**0.531**
Speed (mm/rot)	**10.60**	**10.60**	**10.60**
Rotation Time (s)	**0.5**	**0.5**	**0.5**
kV	**80**	**100**	**120**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(130-400)**	**(130-440)**	**(130-440)**
Manual mA	**210.0**	**210.0**	**210.0**
Noise Index	**3.4**	**3.4**	**3.4**
Slice Thickness (mm)	**5**	**5**	**5**
Interval (mm)	**3.0**	**3.0**	**3.0**

Series 2, Recons

	Infant	Child	Adolescent
Recon 1 (Primary)			
DFOV	**22**	**22**	**22**
Recon Type	**Soft**	**Soft**	**Soft**
WW/WL	**80/25**	**80/25**	**80/25**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option			
ASiR/ASiR256/DLIR	**60% / 30% / Medium**	**60% / 30% / Medium**	**60% / 30% / Medium**
Slice Thickness (mm)	**5.0**	**5.0**	**5.0**
Interval (mm)	**3.0**	**3.0**	**3.0**
Recon 2 (Secondary)			
DFOV	**22**	**22**	**22**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**2500/350**	**2500/350**	**2500/350**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option			
ASiR/ASiR256/DLIR	**None**	**None**	**None**
Slice Thickness (mm)	**2.5**	**2.5**	**2.5**
Interval (mm)	**1.5**	**1.5**	**1.5**
Recon 3 (Secondary)			
DFOV	**22**	**22**	**22**
Recon Type	**Soft**	**Soft**	**Soft**
WW/WL	**180/25**	**180/25**	**180/25**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**80% / 40% / High**	**80% / 40% / High**	**80% / 40% / High**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Series 3, Smart Prep

	Adolescent	Child	Infant
mA	**40**	**40**	**80**
Monitoring Delay (sec)	**10**	**10**	**10**
Monitoring ISD (sec)	**3.0**	**3.0**	**3**
Enhancement Threshold (HU)	**50**	**50**	**50**
Diagnostic Delay	**7**	**7**	**7**

Series 3, Scan Phase

	Infant	Child	Adolescent
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**40**	**40**	**40**
Detector Rows	**64.0**	**64.0**	**64.0**
Detector Configuration	**64x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Medium Body**	**Medium Body**	**Large Body**
Pitch	**0.516**	**0.516**	**0.516**
Speed (mm/rot)	**20.60**	**20.60**	**20.60**
Rotation Time (s)	**0.5**	**0.5**	**0.5**
kV	**80**	**100**	**120**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(190-400)**	**(240-480)**	**(240-560)**
Manual mA	**400.0**	**480.0**	**410.0**
Noise Index	**9.6**	**11.3**	**11.3**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Series 3, Recons

	Infant	Child	Adolescent
Recon 1 (Primary)			
DFOV	**22**	**22**	**22**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**60% / 30% / High**	**60% / 30% / High**	**60% / 30% / High**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**
Recon 2 (Secondary)			
DFOV	**22**	**22**	**22**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**2500/350**	**2500/350**	**2500/350**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**	**None**	**None**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**
Recon 3 (Secondary)			
DFOV	**22**	**22**	**22**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
Recon Option	**MARS On**	**MARS On**	**MARS On**
ASiR/ASiR256/DLIR	**80% / 40% / High**	**80% / 40% / High**	**80% / 40% / High**
Slice Thickness (mm)	**0.625**	**0.625**	**0.625**
Interval (mm)	**0.312**	**0.312**	**0.312**

16 & 32 Slice Scanner Exceptions:

1. The 0.625mm slice thickness x 0.312mm interval Recon should be 1.25mm slice thickness x 0.625mm interval on 16 and 32 slice CT scanners. The 16 and 32 slice scanners are only able to recon down to 0.625mm slice thickness when using 10mm and/or 20mm beam collimation respectively. However, when using 20mm and/or 40mm beam collimation, they are only capable of reconstructing to 1.25mm slice thickness.
2. MARS feature is not an option.
3. IQ Enhance feature requires thin slices (1.25mm or less) with an interval of half (or less). On older scanner models, in order to enable IQ Enhance at 0.625 mm slice thickness, the interval must be set to 0.311 mm instead of 0.312 mm.

DLIR Limitations:

1. DLIR is not available on the Primary Recon.
2. DLIR is only compatible with the Standard Algorithm. So, in instances where the primary recon is Soft algorithm,(i.e. many Neuro Protocols) the subsequent recons will be in Standard Algorithm to enable DLIR. The slight difference between the Soft and Standard Algorithms is outweighed by the improvement in image quality with DLIR enabled.
3. DLIR requires an interval exactly half of the slice thickness.
4. DLIR doesn't allow an interval of 0.312 mm. So, if you are on a DLIR enabled scanner, the thin 0.625 recon will be at 0.625x0.625 mm. On all other scanners the thin recon will be at 0.625x0.312 mm.

Series 4, Scan Phase

	Infant	Child	Adolescent
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**20**	**20**	**20**
Detector Rows	**32.0**	**32.0**	**32.0**
Detector Configuration	**32x0.625**	**32x0.625**	**32x0.625**
Scan FOV	**Head**	**Head**	**Head**
Pitch	**0.531**	**0.531**	**0.531**
Speed (mm/rot)	**10.60**	**10.60**	**10.60**
Rotation Time (s)	**0.6**	**0.7**	**0.6**
kV	**80**	**80**	**100**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(110-370)**	**(110-390)**	**(130-450)**
Manual mA	**170.0**	**190.0**	**230.0**
Noise Index	**3.4**	**4.0**	**4.0**
Slice Thickness (mm)	**5**	**5**	**5**
Interval (mm)	**3.0**	**3.0**	**3.0**

Series 4, Recons

	Infant	Child	Adolescent
Recon 1 (Primary)			
DFOV	**22**	**22**	**22**
Recon Type	**Soft**	**Soft**	**Soft**
WW/WL	**80/25**	**80/25**	**80/25**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option			
ASiR/ASiR256/DLIR	**60% / 30% / Medium**	**60% / 30% / Medium**	**60% / 30% / Medium**
Slice Thickness (mm)	**5.0**	**5.0**	**5.0**
Interval (mm)	**3.0**	**3.0**	**3.0**

Stereotactic Head (Whole Brain Treatment Planning) 11.28/11.29/11.30

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Indication

Stereotactic guidance imaging for use in the Operating Room.

Oral Contrast

None

Pre-Scan Instructions

- Patient Supine in Stealth Head Holder. If your site does not have a Stealth Head holder, next best option is table-top, use the Head Holder only if patient cannot hold still.
- Remove all metallic and high-density objects from the scanning area.
- Be sure to include the Entire nose.
- Have the patient close their eyes for the scan.
- No gantry angle.
- Using the lasers, line up patient so that the canthomeatal line is perpendicular to the CT table. This may require you to tilt the patients head either up or down slightly.

Stealth Head Holder

IV Contrast Parameters 350

Peds:

Weight Ranges	Contrast Dosage	Injection Rate
0-87 kg (0-191 lbs)	1.3 mL/kg (0.6 ml/lbs) of Iohexol 350 mgI/mL	2 mL/sec
Begin scanning 5 minutes after end of injection (~6 minutes from start of injection)		

IV Contrast Parameters 300/370

Peds:

Weight Ranges	Contrast Dosage	Injection Rate
0-80 kg (0-175 lbs)	1.5 mL/kg (0.7 ml/lbs) of Iohexol 300 mgI/mL	2 mL/sec
Begin scanning 5 minutes after end of injection (~6 minutes from start of injection)		

Field of View

25 cm

Scan Description

- Series 1 – Scouts PA and Lateral
- Series 2 - Stereotactic Head: Scan from the hard palate to the top of the head: Be sure to include the entire nose.

Reformat Instructions

No special reformat instructions, see the reformat section for basic details.

Reformats

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
AX ST	ST	Manual	Average	80/25	3	1.5	Axial
CO ST	ST	Manual	Average	80/25	3	1.5	Coronal
SA ST	ST	Manual	Average	80/25	3	1.5	Sagittal

Networking

- All Images to PACS (ALI_Store).
- Note: if smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

Miscellaneous

If there is ANY patient motion, start the scan over.

Choose the CT scan factors on the scanner for the proper age range of the patient:

- Adult: (>= 18 years)
- Adolescent: (7 - 17 years)
- Child: (3 – 6 years)
- Infant: (0 – 2 years)

Acquisition Parameters

Series 1, Scout

	Infant	Child	Adolescent
Scout 1 kV	80	100	120
Scout 1 mA	10	10	10
Scout 1 Angle	180	180	180
Scout 2 kV	80	100	120
Scout 2 mA	20	20	20
Scout 2 Angle	90	90	90
WW/WL for Scout	500/50	500/50	500/50

Series 2, Scan Phase

	Infant	Child	Adolescent
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**20**	**20**	**20**
Detector Rows	**32.0**	**32.0**	**32.0**
Detector Configuration	**32x0.625**	**32x0.625**	**32x0.625**
Scan FOV	**Head**	**Head**	**Head**
Pitch	**0.531**	**0.531**	**0.531**
Speed (mm/rot)	**10.60**	**10.60**	**10.60**
Rotation Time (s)	**0.5**	**0.5**	**0.5**
kV	**80**	**100**	**120**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(130-400)**	**(130-440)**	**(130-440)**
Manual mA	**210.0**	**210.0**	**210.0**
Noise Index	**6.8**	**6.8**	**6.8**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Note, image interval in the table above says 0.625 mm, it should be 1.25 mm for Recon 1 as shown below.

Series 2, Recons

	Infant	Child	Adolescent
Recon 1 (Primary)			
DFOV	**25**	**25**	**25**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**80/25**	**80/25**	**80/25**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**	**None**	**None**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**1.25**	**1.25**	**1.25**
Recon 2 (Secondary)			
DFOV	**25**	**25**	**25**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**2500/350**	**2500/350**	**2500/350**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**	**None**	**None**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**1.25**	**1.25**	**1.25**

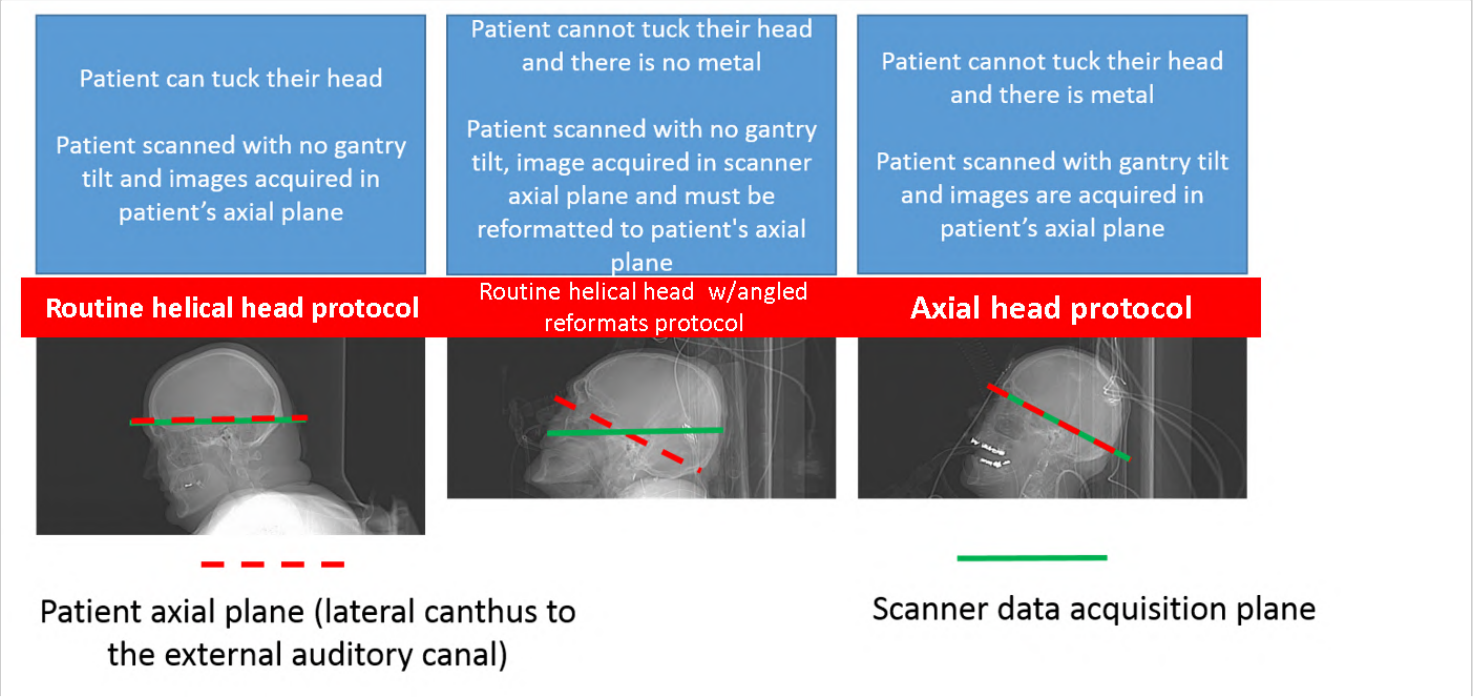
Pediatric Low - Dose Hydrocephalus 11.31/11.32

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Indication

Ventriculostomy shunt - concern for hydrocephalus, evaluate ventricle size



Guidance on choosing the correct version of the routine head protocol

Oral Contrast

None

Pre-Scan Instructions

- Helical mode should be used routinely for head CT scans. Only use axial mode when you cannot move the patient's head into proper position (trauma, cervical collar, rigid neck), AND dental work would cause streak artifact in base of brain.
- Positioning: Tilt the patients head so that a line connecting the lateral canthus of the eye and the EAC is perpendicular to the CT tabletop (see below). Use axial mode and angle the gantry if you cannot place the patient's head within 15 degrees of the proper setup angle.
- Remove all metallic and high-density objects from the scanning area.

IV Contrast Parameters

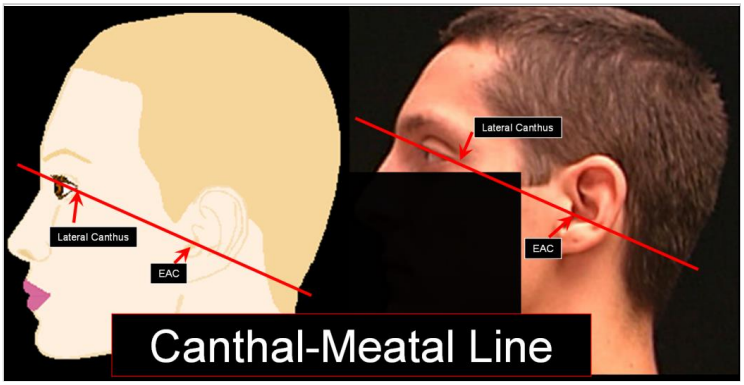
None

Field of View

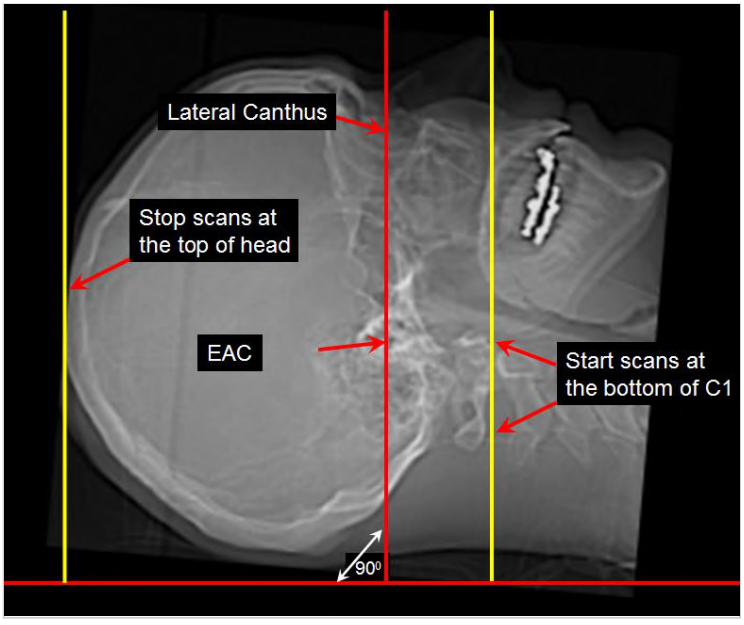
Preferred 22 cm

Scan Description

- Series 1-Scouts PA and Lateral
- Series 2-Scan Phase
  - Scan Range, start scans at the bottom of C1 and scan through the top of the head



Canthal-Meatal Line



scan range for brain

Reformat Instructions

See the table below.

If the patient's true axial plane is not aligned with the scanner's axial plane, please preform an additional axial soft tissue and axial bone reformat. You will have to manually align the images to the patient's true axial plane.

Reformats

Name (Peds)	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL (Peds)	Slice Thickness (mm) (Peds)	Interval (mm) (Peds)	Orientation
CO ST	THIN ST	Manual	Average	150/30	3	1.5	Coronal
SA ST	THIN ST	Manual	Average	150/30	3	1.5	Sagittal

Networking

- All Images to PACS (ALI_Store).
- Note: if smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

Miscellaneous

Choose the CT scan factors on the scanner for the proper age range of the patient:

- Adult: (>= 18 years)
- Adolescent: (7 - 17 years)
- Child: (3 – 6 years)
- Infant: (0 – 2 years)

Acquisition Parameters

Series 1, Scout

	Infant	Child
Scout 1 kV	**80**	**100**
Scout 1 mA	**10**	**10**
Scout 1 Angle	**180**	**180**
Scout 2 kV	**80**	**100**
Scout 2 mA	**20**	**20**
Scout 2 Angle	**90**	**90**
WW/WL for Scout	**500/50**	**500/50**

Series 2, Scan Phase

	Infant	Child
Scan Type	**Helical**	**Helical**
Beam Collimation	**20**	**20**
Detector Rows	**32.0**	**32.0**
Detector Configuration	**32x0.625**	**32x0.625**
Scan FOV	**Head**	**Head**
Pitch	**0.531**	**0.531**
Speed (mm/rot)	**10.60**	**10.60**
Rotation Time (s)	**0.5**	**0.5**
kV	**80**	**100**
AEC type	**smart mA**	**smart mA**
mA Range	**(30-110)**	**(30-110)**
Manual mA	**50.0**	**50.0**
Noise Index	**13.6**	**13.6**
Slice Thickness (mm)	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**

Series 2, Recons

	Infant	Child
Recon 1 (Primary)		
DFOV	**22**	**22**
Recon Type	**Soft**	**Soft**
WW/WL	**180/25**	**180/25**
Recon Option	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**80% / 40% / High**	**80% / 40% / High**
Slice Thickness (mm)	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**
Recon 2 (Secondary)		
DFOV	**22**	**22**
Recon Type	**Bone Plus**	**Bone Plus**
WW/WL	**2500/350**	**2500/350**
Recon Option	**Plus**	**Plus**
Recon Option		
ASiR/ASiR256/DLIR	**None**	**None**
Slice Thickness (mm)	**2.5**	**2.5**
Interval (mm)	**1.5**	**1.5**
Recon 3 (Secondary)		
DFOV	**22**	**22**
Recon Type	**Soft**	**Soft**
WW/WL	**80/25**	**80/25**
Recon Option	**Plus**	**Plus**
Recon Option		
ASiR/ASiR256/DLIR	**60% / 30% / Medium**	**60% / 30% / Medium**
Slice Thickness (mm)	**5.0**	**5.0**
Interval (mm)	**3.0**	**3.0**

DLIR Limitations:

1. DLIR is not available on the Primary Recon.
2. DLIR is only compatible with the Standard Algorithm. So, in instances where the primary recon is Soft algorithm,(i.e. many Neuro Protocols) the subsequent recons will be in Standard Algorithm to enable DLIR. The slight difference between the Soft and Standard Algorithms is outweighed by the improvement in image quality with DLIR enabled.
3. DLIR requires an interval exactly half of the slice thickness.
4. DLIR doesn't allow an interval of 0.312 mm. So, if you are on a DLIR enabled scanner, the thin 0.625 recon will be at 0.625x0.625 mm. On all other scanners the thin recon will be at 0.625x0.312 mm.

Peds Orbit - Routine 12.1/12.2/12.3

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Indication

Orbital Mass, Foreign Body, Trauma, Orbital / Periorbital cellulitis, proptosis

Oral Contrast

None

Pre-Scan Instructions

- Patient Positioning: Tilt the patients head so that a line connecting the lateral canthus of the eye and the EAC is perpendicular to the CT tabletop (see head CT protocol). You may need to put a foam pad under the occiput to get the head in this position.
- Ask the patient to look straight ahead and hold their eyes in a very still position.

IV Contrast Parameters 350

Pediatrics

Weight Ranges	Contrast Dosage	Injection Rate
0-80 kgs (0-175 lbs)	1.3 mL/kg (0.6 mL/lbs) of Iohexol 350 mgI/mL	2 mL/sec
Delay for Pediatrics: (Ages 0-17 Yrs) 45 sec after start of injection		

IV Contrast Parameters 300/370

Pediatrics

Weight Ranges	Contrast Dosage	Injection Rate
0-80 kgs (0-175 lbs)	1.5 mL/kg (0.7 mL/lbs) of Iohexol 300 mgI/mL	2 mL/sec
Delay for Pediatrics: (Ages 0-17 Yrs) 45 sec after start of injection		

Field of View

Preferred 16cm

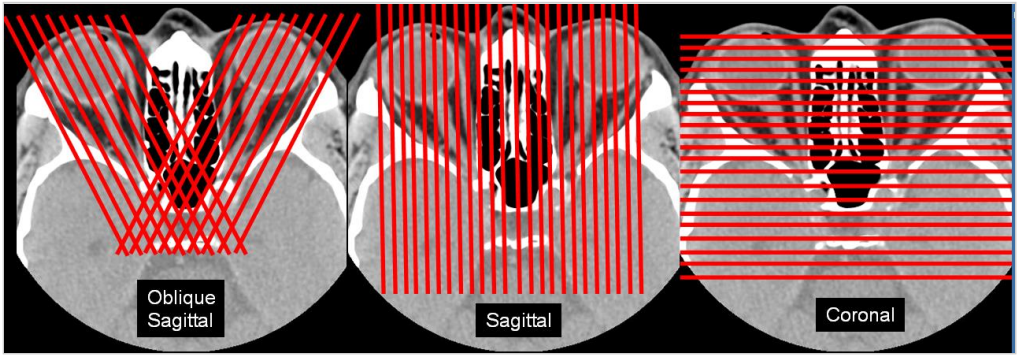
Scan Description

- Series 1 - Scouts PA and Lateral
- Series 2 – CT Orbit Without: Start the scans at the infraorbital rim and scan through the top of the orbit.
- Series 3 - CT Orbit With: Start the scans at the infraorbital rim and scan through the top of the orbit.
  - (If Indicated by protocol for Contrast) Delay: Pediatrics: 45 sec after start of injection. These Prep Delays are built into the protocols.

Reformat Instructions

- All 2-D reformats described below are to be done as 2 mm x 1 mm reformats. Do them in the coronal, sagittal, and bilateral oblique sagittal planes as shown in the image below.
- If this is an exam solely With contrast or solely Without contrast: Please perform 2D-reformats using both the ST AND the THIN BONE.
- If this is a “With & Without” contrast study: Please perform 2D reformats using ST from the With contrast series and THIN BONE from Non-Contrast series.

- Do not send the 0.625 mm bone images to PACS.



Orbit

Reformats

With or Without Contrast

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
CO ST	THIN ST	Manual	Average	300/0	2	1	Coronal
CO BONE	THIN BONE	Manual	Average	2500/350	2	1	Coronal
SA ST	THIN ST	Manual	Average	300/0	2	1	Sagittal
SA BONE	THIN BONE	Manual	Average	2500/350	2	1	Sagittal
RT OBL	THIN ST	Manual	Average	300/0	2	1	Oblique
RT OBL	THIN BONE	Manual	Average	2500/350	2	1	Oblique
LT OBL	THIN ST	Manual	Average	300/0	2	1	Oblique
LT OBL	THIN BONE	Manual	Average	2500/350	2	1	Oblique

With and Without Contrast (SOFT TISSUE reformats are made from the with contrast phase, BONE reformats are made from the without contrast phase)

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
CO ST	THIN ST (with contrast phase)	Manual	Average	300/0	2	1	Coronal
CO BONE	THIN BONE (without contrast phase)	Manual	Average	2500/350	2	1	Coronal
SA ST	THIN ST (with contrast phase)	Manual	Average	300/0	2	1	Sagittal
SA BONE	THIN BONE (without contrast phase)	Manual	Average	2500/350	2	1	Sagittal
RT OBL	THIN ST (with contrast phase)	Manual	Average	300/0	2	1	Oblique
RT OBL	THIN BONE (without contrast phase)	Manual	Average	2500/350	2	1	Oblique
LT OBL	THIN ST (with contrast phase)	Manual	Average	300/0	2	1	Oblique
LT OBL	THIN BONE (without contrast phase)	Manual	Average	2500/350	2	1	Oblique

Networking

- All Images to PACS (ALI_Store).
- Note: If smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

Miscellaneous

Choose the CT scan factors on the scanner for the proper age range of the patient:

- Adult: (>= 18 years)
- Adolescent: (7 - 17 years)
- Child: (3 – 6 years)
- Infant: (0 – 2 years)

Acquisition Parameters

Series 1, Scout

	Infant	Child	Adolescent
Scout 1 kV	**80**	**100**	**120**
Scout 1 mA	**10**	**10**	**10**
Scout 1 Angle	**180**	**180**	**180**
Scout 2 kV	**80**	**100**	**120**
Scout 2 mA	**20**	**20**	**20**
Scout 2 Angle	**90**	**90**	**90**
WW/WL for Scout	**500/50**	**500/50**	**500/50**

Series 2, Scan Phase

	Infant	Child	Adolescent
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**20**	**20**	**20**
Detector Rows	**32.0**	**32.0**	**32.0**
Detector Configuration	**32x0.625**	**32x0.625**	**32x0.625**
Scan FOV	**Head**	**Head**	**Head**
Pitch	**0.531**	**0.531**	**0.531**
Speed (mm/rot)	**10.60**	**10.60**	**10.60**
Rotation Time (s)	**0.5**	**0.5**	**0.5**
kV	**80**	**100**	**120**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(130-400)**	**(130-440)**	**(130-440)**
Manual mA	**210.0**	**210.0**	**210.0**
Noise Index	**6.8**	**6.8**	**6.8**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Series 2, Recons

	Infant	Child	Adolescent
Recon 1 (Primary)			
DFOV	**16**	**16**	**18**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**300/0**	**300/0**	**300/0**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**60% / 30% / High**	**60% / 30% / High**	**60% / 30% / High**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**
Recon 2 (Secondary)			
DFOV	**16**	**16**	**18**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**2500/350**	**2500/350**	**2500/350**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**	**None**	**None**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**
Recon 3 (Secondary)			
DFOV	**16**	**16**	**18**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**2500/350**	**2500/350**	**2500/350**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**	**None**	**None**
Slice Thickness (mm)	**0.625**	**0.625**	**0.625**
Interval (mm)	**0.312**	**0.312**	**0.312**

Series 3, Scan Phase

	Infant	Child	Adolescent
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**20**	**20**	**20**
Detector Rows	**32.0**	**32.0**	**32.0**
Detector Configuration	**32x0.625**	**32x0.625**	**32x0.625**
Scan FOV	**Head**	**Head**	**Head**
Pitch	**0.531**	**0.531**	**0.531**
Speed (mm/rot)	**10.60**	**10.60**	**10.60**
Rotation Time (s)	**0.6**	**0.7**	**0.6**
kV	**80**	**80**	**100**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(110-370)**	**(110-390)**	**(130-450)**
Manual mA	**170.0**	**190.0**	**230.0**
Noise Index	**6.8**	**8.0**	**8.0**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Series 3, Recons

	Infant	Child	Adolescent
Recon 1 (Primary)			
DFOV	**16**	**16**	**18**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**300/0**	**300/0**	**300/0**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**60% / 30% / High**	**60% / 30% / High**	**60% / 30% / High**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**
Recon 2 (Secondary)			
DFOV	**16**	**16**	**18**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**2500/350**	**2500/350**	**2500/350**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**	**None**	**None**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**
Recon 3 (Secondary)			
DFOV	**16**	**16**	**18**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**2500/350**	**2500/350**	**2500/350**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**	**None**	**None**
Slice Thickness (mm)	**0.625**	**0.625**	**0.625**
Interval (mm)	**0.312**	**0.312**	**0.312**

16 & 32 Slice Scanner Exceptions:

1. The 0.625mm slice thickness x 0.312mm interval Recon should be 1.25mm slice thickness x 0.625mm interval on 16 and 32 slice CT scanners. The 16 and 32 slice scanners are only able to recon down to 0.625mm slice thickness when using 10mm and/or 20mm beam collimation respectively. However, when using 20mm and/or 40mm beam collimation, they are only capable of reconstructing to 1.25mm slice thickness.
2. MARS feature is not an option.
3. IQ Enhance feature requires thin slices (1.25mm or less) with an interval of half (or less). On older scanner models, in order to enable IQ Enhance at 0.625 mm slice thickness, the interval must be set to 0.311 mm instead of 0.312 mm.

DLIR Limitations:

1. DLIR is not available on the Primary Recon.
2. DLIR is only compatible with the Standard Algorithm. So, in instances where the primary recon is Soft algorithm,(i.e. many Neuro Protocols) the subsequent recons will be in Standard Algorithm to enable DLIR. The slight difference between the Soft and Standard Algorithms is outweighed by the improvement in image quality with DLIR enabled.
3. DLIR requires an interval exactly half of the slice thickness.
4. DLIR doesn't allow an interval of 0.312 mm. So, if you are on a DLIR enabled scanner, the thin 0.625 recon will be at 0.625x0.625 mm. On all other scanners the thin recon will be at 0.625x0.312 mm.

Peds Temporal Bone 12.4/12.5/12.6

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Indication

Otitis / mastoiditis with concern for abscess, intracranial spread, venous thrombosis

Video for this protocol

Oral Contrast

None

Pre-Scan Instructions

- Patient Positioning: Tilt the patient's head so that a line connecting the lateral canthus of the eye and the EAC is perpendicular to the CT tabletop (see below).
- Remove all metallic and high-density objects from the scanning area.

IV Contrast Parameters 350

Pediatrics

Weight Ranges	Contrast Dosage	Injection Rate
0-80 kgs (0-175 lbs)	1.3 mL/kg (0.6 mL/lbs) of Iohexol 350 mgI/mL	2 mL/sec
Delay for Pediatrics: (Ages 0-17 Yrs) 45 sec after start of injection		

IV Contrast Parameters 300/370

Pediatrics

Weight Ranges	Contrast Dosage	Injection Rate
0-80 kgs (0-175 lbs)	1.5 mL/kg (0.7 mL/lbs) of Iohexol 300 mgI/mL	2 mL/sec
Delay for Pediatrics: (Ages 0-17 Yrs) 45 sec after start of injection		

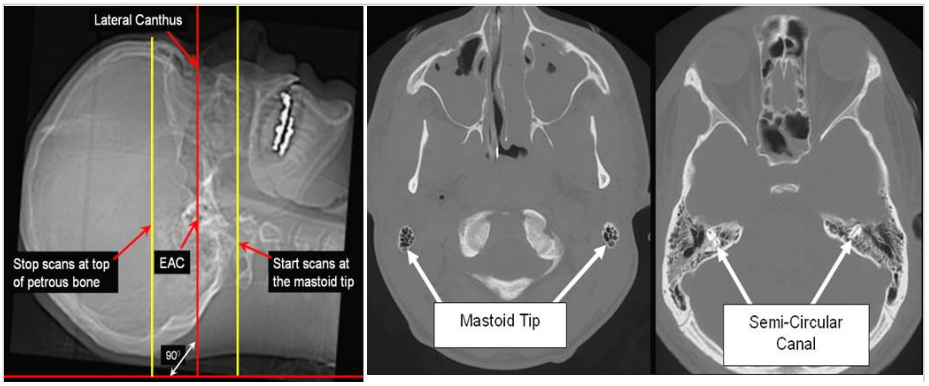
Field of View

1. Recon 1 and 4: Preferred 22 cm
2. Recon 2 and 3: Preferred 9.6 cm - Individual T-bones (right and left).

Scan Description

- Series 1 – Scout PA and Lateral
- Series 2 - Helical Scan - Select ONE of the 3 following options:
  - 1) T-bone WITHOUT
    - Coverage: Start scans at the mastoid tip and end at the top of the petrous bone (see image below).
  - 2) T-bone WITH
    - Coverage: Start scans at the mastoid tip and end at the top of the petrous bone (see image below).
    - Timing: Begin scanning 45 seconds (peds) after the start of contrast.
  - 3) T-Bone W/O and WITH
    - Coverage: Start scans at the mastoid tip and end at the top of the petrous bone (see image below).
    - Use "Repeat Series" to scan the WITH contrast phase, same coverage as WITHOUT series.

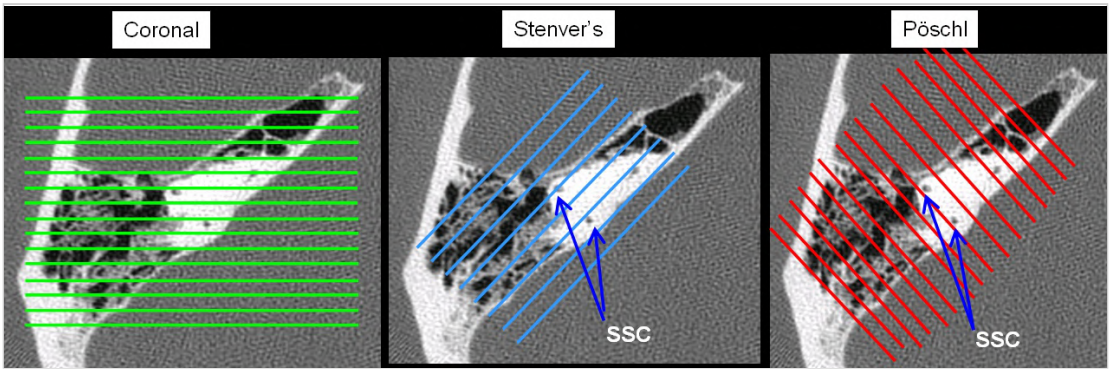
- Timing: Begin scanning 45 seconds (peds) after the start of contrast.



scan range for tbone

Reformat Instructions

- Do 1 mm by 0.5 mm 2D-reformats in the coronal, Stenver's, and Pöschl planes of each temporal bone using THIN BONE.



Sagittal and Coronal

Reformats

If ordered as without and with, do these reformats for each phase (12 total)

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
RT CO	THIN BONE	Manual	Average	2500/350	1	0.5	Coronal
RT STENV	THIN BONE	Manual	Average	2500/350	1	0.5	Oblique
RT POSCH	THIN BONE	Manual	Average	2500/350	1	0.5	Oblique
LT CO	THIN BONE	Manual	Average	2500/350	1	0.5	Coronal
LT STENV	THIN BONE	Manual	Average	2500/350	1	0.5	Oblique
LT POSCH	THIN BONE	Manual	Average	2500/350	1	0.5	Oblique

Networking

- All Images to PACS (ALI_Store).
- Note: if smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

Miscellaneous

Choose the CT scan factors on the scanner for the proper age range of the patient:

- Adult: (>= 18 years)

- Adolescent: (7 - 17 years)
- Child: (3 – 6 years)
- Infant: (0 – 2 years)

Acquisition Parameters

Series 1, Scout

	Infant	Child	Adolescent
Scout 1 kV	**80**	**100**	**120**
Scout 1 mA	**10**	**10**	**10**
Scout 1 Angle	**180**	**180**	**180**
Scout 2 kV	**80**	**100**	**120**
Scout 2 mA	**20**	**20**	**20**
Scout 2 Angle	**90**	**90**	**90**
WW/WL for Scout	**500/50**	**500/50**	**500/50**

Series 2, Scan Phase

	Infant	Child	Adolescent
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**20**	**20**	**20**
Detector Rows	**32.0**	**32.0**	**32.0**
Detector Configuration	**32x0.625**	**32x0.625**	**32x0.625**
Scan FOV	**Head**	**Head**	**Head**
Pitch	**0.531**	**0.531**	**0.531**
Speed (mm/rot)	**10.60**	**10.60**	**10.60**
Rotation Time (s)	**0.5**	**0.5**	**0.5**
kV	**80**	**100**	**120**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(130-400)**	**(130-440)**	**(130-440)**
Manual mA	**210.0**	**210.0**	**210.0**
Noise Index	**6.8**	**4.8**	**4.8**
Slice Thickness (mm)	**1.25**	**2.5**	**2.5**
Interval (mm)	**0.625**	**1.5**	**1.5**

Series 2, Recons

When on a Revolution 256 model scanner, we recommend switching the boneplus kernel to ULTRA for the 22 cm RFOV.

	Infant	Child	Adolescent
Recon 1 (Primary)			
DFOV	**22**	**22**	**22**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**2500/350**	**2500/350**	**2500/350**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option			
ASiR/ASiR256/DLIR	**None**	**None**	**None**
Slice Thickness (mm)	**1.25**	**2.5**	**2.5**
Interval (mm)	**0.625**	**1.5**	**1.5**
Recon 2 (Secondary)			
DFOV	**9.6**	**9.6**	**9.6**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**2500/350**	**2500/350**	**2500/350**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**	**None**	**None**
Slice Thickness (mm)	**0.625**	**0.625**	**0.625**
Interval (mm)	**0.312**	**0.312**	**0.312**
Recon 3 (Secondary)			
DFOV	**9.6**	**9.6**	**9.6**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**2500/350**	**2500/350**	**2500/350**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**	**None**	**None**
Slice Thickness (mm)	**0.625**	**0.625**	**0.625**
Interval (mm)	**0.312**	**0.312**	**0.312**
Recon 4 (Secondary)			
DFOV	**22**	**22**	**22**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**60% / 30% / High**	**60% / 30% / High**	**60% / 30% / High**
Slice Thickness (mm)	**1.25**	**2.5**	**2.5**
Interval (mm)	**0.625**	**1.5**	**1.5**

Peds Facial Trauma - Routine 12.7/12.8/12.9

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Indication

Facial Trauma / Reconstruction, Maxillofacial surgery follow-up

Oral Contrast

None

Pre-Scan Instructions

- Remove all metallic and high-density objects from the scanning area.
- Patient Positioning: Tilt the patient's head so that a line connecting the lateral canthus and the EAC is perpendicular to the CT tabletop (see head CT protocol).

IV Contrast Parameters 350

Pediatrics

Weight Ranges	Contrast Dosage	Injection Rate
0-80 kgs (0-175 lbs)	1.3 mL/kg (0.6 mL/lbs) of Iohexol 350 mgI/mL	2 mL/sec
Delay for Pediatrics: (Ages 0-17 Yrs) 45 sec after start of injection		

IV Contrast Parameters 300/370

Pediatrics

Weight Ranges	Contrast Dosage	Injection Rate
0-80 kgs (0-175 lbs)	1.5 mL/kg (0.7 mL/lbs) of Iohexol 300 mgI/mL	2 mL/sec
Delay for Pediatrics: (Ages 0-17 Yrs) 45 sec after start of injection		

Field of View

Preferred 16cm

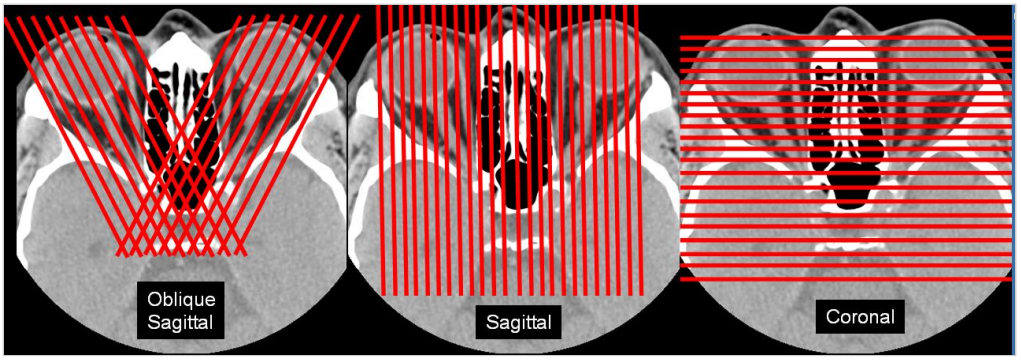
Scan Description

- Series 1 – Scouts PA and Lateral
- Series 2 – Facial Trauma Without Contrast: Start just below the mandible to the top of the frontal sinuses.
- Series 3 - Facial Trauma With Contrast: Start just below the mandible to the top of the frontal sinuses.
  - (If Indicated to do with contrast) Delay: Pediatrics: 45 sec after start of injection. These Prep Delays are built into the protocol.

Reformat Instructions

- All 2-D reformats described below are to be done as 2 mm x 1 mm reformats as shown in the image below
  - Oblique Sagittal: Through each orbit parallel to the optic nerves.
  - Sagittal: Through both orbits. Be sure to include both TMJs.
  - Coronal: From the anterior aspect of the superior orbital rim through the sella. Be sure to include all of the TMJ.
- If this is an exam solely With contrast or solely Without contrast: Please perform 2D-reformats using both the ST AND the THIN BONE.

- If this is a “With & Without” contrast study: Please perform 2D reformats using ST from the With contrast series and THIN BONE from Non-Contrast series.



Orbit

Reformats

With or Without Contrast

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
CO ST	THIN ST	Manual	Average	450/50	2	1	Coronal
CO BONE	THIN BONE	Manual	Average	2500/350	2	1	Coronal
SA ST	THIN ST	Manual	Average	450/50	2	1	Sagittal
SA BONE	THIN BONE	Manual	Average	2500/350	2	1	Sagittal
RT OBL	THIN ST	Manual	Average	450/50	2	1	Oblique
RT OBL	THIN BONE	Manual	Average	2500/350	2	1	Oblique
LT OBL	THIN ST	Manual	Average	450/50	2	1	Oblique
LT OBL	THIN BONE	Manual	Average	2500/350	2	1	Oblique

With and Without Contrast (SOFT TISSUE reformats are made from the with contrast phase, BONE reformats are made from the without contrast phase)

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
CO ST	THIN ST (with contrast phase)	Manual	Average	450/50	2	1	Coronal
CO BONE	THIN BONE (without contrast phase)	Manual	Average	2500/350	2	1	Coronal
SA ST	THIN ST (with contrast phase)	Manual	Average	450/50	2	1	Sagittal
SA BONE	THIN BONE (without contrast phase)	Manual	Average	2500/350	2	1	Sagittal
RT OBL	THIN ST (with contrast phase)	Manual	Average	450/50	2	1	Oblique
RT OBL	THIN BONE (without contrast phase)	Manual	Average	2500/350	2	1	Oblique
LT OBL	THIN ST (with contrast phase)	Manual	Average	450/50	2	1	Oblique
LT OBL	THIN BONE (without contrast phase)	Manual	Average	2500/350	2	1	Oblique

Networking

- All Images to PACS (ALI_Store).
- Note: if smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

All MAR recons and reformats should be sent to PACS (ALI_Store). Label MAR reformats with the word "MAR" at the end, for example "CO ST MAR".

Miscellaneous

Choose the CT scan factors on the scanner for the proper age range of the patient:

- Adult: (>= 18 years)
- Adolescent: (7 - 17 years)
- Child: (3 – 6 years)
- Infant: (0 – 2 years)

Acquisition Parameters

Series 1, Scout

	Infant	Child	Adolescent
Scout 1 kV	**80**	**100**	**120**
Scout 1 mA	**10**	**10**	**10**
Scout 1 Angle	**180**	**180**	**180**
Scout 2 kV	**80**	**100**	**120**
Scout 2 mA	**20**	**20**	**20**
Scout 2 Angle	**90**	**90**	**90**
WW/WL for Scout	**500/50**	**500/50**	**500/50**

Series 2, Scan Phase

	Infant	Child	Adolescent
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**20**	**20**	**20**
Detector Rows	**32.0**	**32.0**	**32.0**
Detector Configuration	**32x0.625**	**32x0.625**	**32x0.625**
Scan FOV	**Head**	**Head**	**Head**
Pitch	**0.531**	**0.531**	**0.531**
Speed (mm/rot)	**10.60**	**10.60**	**10.60**
Rotation Time (s)	**0.5**	**0.5**	**0.5**
kV	**80**	**100**	**120**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(130-400)**	**(130-440)**	**(130-440)**
Manual mA	**210.0**	**210.0**	**210.0**
Noise Index	**6.8**	**6.8**	**6.8**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Series 2, Recons

When on a Revolution 256 model scanner, we recommend switching the boneplus kernel to ULTRA.

	Infant	Child	Adolescent
Recon 1 (Primary)			
DFOV	**18**	**18**	**18**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**60% / 30% / High**	**60% / 30% / High**	**60% / 30% / High**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**
Recon 2 (Secondary)			
DFOV	**18**	**18**	**18**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**2500/350**	**2500/350**	**2500/350**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR			
Slice Thickness (mm)	**0.625**	**0.625**	**0.625**
Interval (mm)	**0.312**	**0.312**	**0.312**
Recon 3 (Secondary)			
DFOV	**18**	**18**	**18**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
Recon Option	**MARS On**	**MARS On**	**MARS On**
ASiR/ASiR256/DLIR	**60% / 30% / High**	**60% / 30% / High**	**60% / 30% / High**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Series 3, Scan Phase

	Infant	Child	Adolescent
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**20**	**20**	**20**
Detector Rows	**32.0**	**32.0**	**32.0**
Detector Configuration	**32x0.625**	**32x0.625**	**32x0.625**
Scan FOV	**Head**	**Head**	**Head**
Pitch	**0.531**	**0.531**	**0.531**
Speed (mm/rot)	**10.60**	**10.60**	**10.60**
Rotation Time (s)	**0.6**	**0.7**	**0.6**
kV	**80**	**80**	**100**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(110-370)**	**(110-390)**	**(130-450)**
Manual mA	**170.0**	**190.0**	**230.0**
Noise Index	**6.8**	**8.0**	**8.0**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Series 2, Recons

When on a Revolution 256 model scanner, we recommend switching the boneplus kernel to ULTRA.

	Infant	Child	Adolescent
Recon 1 (Primary)			
DFOV	**18**	**18**	**18**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**60% / 30% / High**	**60% / 30% / High**	**60% / 30% / High**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**
Recon 2 (Secondary)			
DFOV	**18**	**18**	**18**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**2500/350**	**2500/350**	**2500/350**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR			
Slice Thickness (mm)	**0.625**	**0.625**	**0.625**
Interval (mm)	**0.312**	**0.312**	**0.312**
Recon 3 (Secondary)			
DFOV	**18**	**18**	**18**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
Recon Option	**MARS On**	**MARS On**	**MARS On**
ASiR/ASiR256/DLIR	**60% / 30% / High**	**60% / 30% / High**	**60% / 30% / High**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Peds Sinus - Diagnostic 12.10/12.11/12.12

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Indication

Rhinosinusitis, Sinusitis, Nasal Discharge, Facial pain, Sinus surgery planning. If the indication is for pre-transplant workup - please be sure to include the mandible.

Video for this protocol

Oral Contrast

None

Pre-Scan Instructions

- Positioning: Tilt the patient's head so that a line connecting the lateral canthus of the eye and the EAC is perpendicular to the CT tabletop (see below). The tip of the nose and both zygomatic bones must be on the scan.
- Use Axial CT Mode with patient positioned prone if a Coronal plane scan is ordered.
- Remove all metallic and high-density objects from the scanning area.

IV Contrast Parameters 350

Pediatrics

Weight Ranges	Contrast Dosage	Injection Rate
0-80 kgs (0-175 lbs)	1.3 mL/kg (0.6 mL/lbs) of Iohexol 350 mgI/mL	2 mL/sec
Delay for Pediatrics: (Ages 0-17 Yrs) 45 sec after start of injection		

IV Contrast Parameters 300/370

Pediatrics

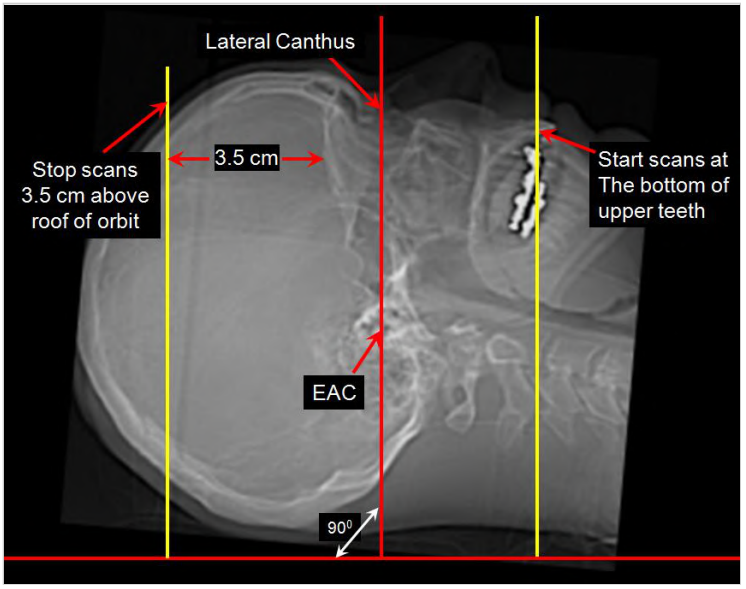
Weight Ranges	Contrast Dosage	Injection Rate
0-80 kgs (0-175 lbs)	1.5 mL/kg (0.7 mL/lbs) of Iohexol 300 mgI/mL	2 mL/sec
Delay for Pediatrics: (Ages 0-17 Yrs) 45 sec after start of injection		

Field of View

Preferred 14 cm

Scan Description

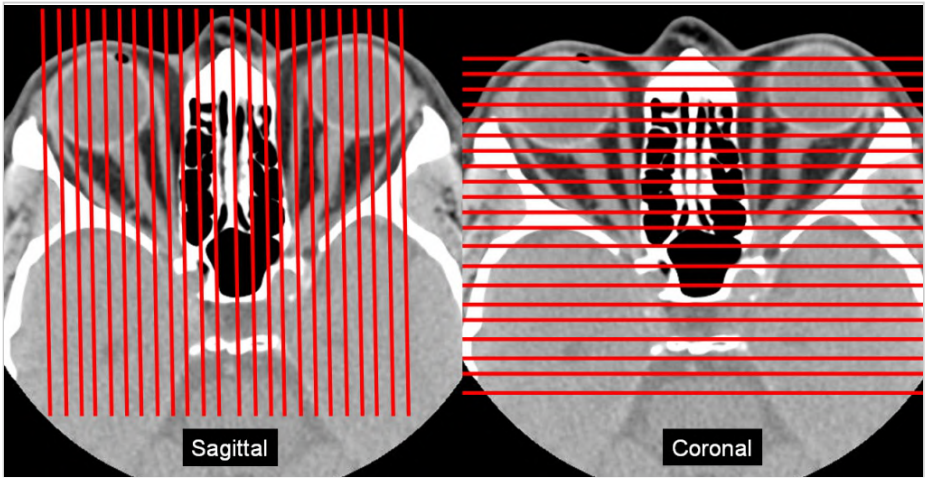
- Series 1 – Scouts PA and Lateral
- Series 2 – CT Sinus Without Contrast:
  - Peds: Scan from bottom of upper teeth to top of frontal sinuses
- Series 3 – (If Indicated to do with contrast) Delay: Pediatrics: 45 sec after start of injection
- Series 3 – CT Sinus With Contrast:
  - Peds: Scan from bottom of upper teeth to top of frontal sinuses.



scan range for sinus

Reformat Instructions

- All 2-D reformats described below are to be done as 2 mm x 1 mm reformats (see below)
  - Sagittal: Through both orbits. Be sure to include both TMJs.
  - Coronal: From the anterior aspect of the superior orbital rim through the sella. Be sure to include all of the TMJ.
- If this is an exam solely With contrast or solely Without contrast: Please perform 2D-reformats using both the ST AND the THIN BONE.
- If this is a "With & Without" contrast study: Please perform 2D reformats using ST from the With contrast series and THIN BONE from Non-Contrast series.



Sagittal and Coronal

Reformats

With or Without Contrast

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
CO ST	THIN ST	Manual	Average	400/30	2	1	Coronal
CO BONE	THIN BONE	Manual	Average	2500/350	2	1	Coronal
SA ST	THIN ST	Manual	Average	400/30	2	1	Sagittal
SA BONE	THIN BONE	Manual	Average	2500/350	2	1	Sagittal

With and Without Contrast (SOFT TISSUE reformats are made from the with contrast phase, BONE reformats are made from the without contrast phase)

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
CO ST	THIN ST (with contrast phase)	Manual	Average	400/30	2	1	Coronal
CO BONE	THIN BONE (without contrast phase)	Manual	Average	2500/350	2	1	Coronal
SA ST	THIN ST (with contrast phase)	Manual	Average	400/30	2	1	Sagittal
SA BONE	THIN BONE (without contrast phase)	Manual	Average	2500/350	2	1	Sagittal

Networking

- All Images to PACS (ALI_Store).
- Note: if smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

Miscellaneous

Choose the CT scan factors on the scanner for the proper age range of the patient:

- Adult: (>= 18 years)
- Adolescent: (7 - 17 years)
- Child: (3 – 6 years)
- Infant: (0 – 2 years)

Acquisition Parameters

Series 1, Scout

	Infant	Child	Adolescent
Scout 1 kV	80	100	120
Scout 1 mA	10	10	10
Scout 1 Angle	180	180	180
Scout 2 kV	80	100	120
Scout 2 mA	20	20	20
Scout 2 Angle	90	90	90
WW/WL for Scout	500/50	500/50	500/50

Series 2, Scan Phase

	Infant	Child	Adolescent
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**20**	**20**	**20**
Detector Rows	**32.0**	**32.0**	**32.0**
Detector Configuration	**32x0.625**	**32x0.625**	**32x0.625**
Scan FOV	**Head**	**Head**	**Head**
Pitch	**0.531**	**0.531**	**0.531**
Speed (mm/rot)	**10.60**	**10.60**	**10.60**
Rotation Time (s)	**0.5**	**0.5**	**0.5**
kV	**80**	**100**	**120**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(30-110)**	**(30-110)**	**(30-110)**
Manual mA	**50.0**	**50.0**	**50.0**
Noise Index	**13.6**	**13.6**	**13.6**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Series 2, Recons

	Infant	Child	Adolescent
Recon 1 (Primary)			
DFOV	**14**	**14**	**14**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**400/30**	**400/30**	**400/30**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**80% / 40% / High**	**80% / 40% / High**	**80% / 40% / High**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**
Recon 2 (Secondary)			
DFOV	**14**	**14**	**14**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**2500/350**	**2500/350**	**2500/350**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**	**None**	**None**
Slice Thickness (mm)	**0.625**	**0.625**	**0.625**
Interval (mm)	**0.312**	**0.312**	**0.312**
Recon 3 (Secondary)			
DFOV	**14**	**14**	**14**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**400/30**	**400/30**	**400/30**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
Recon Option	**MARS On**	**MARS On**	**MARS On**
ASiR/ASiR256/DLIR	**80% / 40% / High**	**80% / 40% / High**	**80% / 40% / High**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

16 & 32 Slice Scanner Exceptions:

1. The 0.625mm slice thickness x 0.312mm interval Recon should be 1.25mm slice thickness x 0.625mm interval on 16 and 32 slice CT scanners. The 16 and 32 slice scanners are only able to recon down to 0.625mm slice thickness when using 10mm and/or 20mm beam collimation respectively. However, when using 20mm and/or 40mm beam collimation, they are only capable of reconstructing to 1.25mm slice thickness.
2. MARS feature is not an option.
3. IQ Enhance feature requires thin slices (1.25mm or less) with an interval of half (or less). On older scanner models, in order to enable IQ Enhance at 0.625 mm slice thickness, the interval must be set to 0.311 mm instead of 0.312 mm.

Series 3, Scan Phase

	Infant	Child	Adolescent
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**20**	**20**	**20**
Detector Rows	**32.0**	**32.0**	**32.0**
Detector Configuration	**32x0.625**	**32x0.625**	**32x0.625**
Scan FOV	**Head**	**Head**	**Head**
Pitch	**0.531**	**0.531**	**0.531**
Speed (mm/rot)	**10.60**	**10.60**	**10.60**
Rotation Time (s)	**0.5**	**0.5**	**0.5**
kV	**80**	**80**	**100**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(30-110)**	**(40-140)**	**(40-140)**
Manual mA	**50.0**	**70.0**	**70.0**
Noise Index	**13.6**	**16.0**	**16.0**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Series 3, Recons

	Infant	Child	Adolescent
Recon 1 (Primary)			
DFOV	**14**	**14**	**14**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**400/30**	**400/30**	**400/30**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**80% / 40% / High**	**80% / 40% / High**	**80% / 40% / High**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**
Recon 2 (Secondary)			
DFOV	**14**	**14**	**14**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**2500/350**	**2500/350**	**2500/350**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**	**None**	**None**
Slice Thickness (mm)	**0.625**	**0.625**	**0.625**
Interval (mm)	**0.312**	**0.312**	**0.312**
Recon 3 (Secondary)			
DFOV	**14**	**14**	**14**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**400/30**	**400/30**	**400/30**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
Recon Option	**MARS On**	**MARS On**	**MARS On**
ASiR/ASiR256/DLIR	**80% / 40% / High**	**80% / 40% / High**	**80% / 40% / High**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

16 & 32 Slice Scanner Exceptions:

1. The 0.625mm slice thickness x 0.312mm interval Recon should be 1.25mm slice thickness x 0.625mm interval on 16 and 32 slice CT scanners. The 16 and 32 slice scanners are only able to recon down to 0.625mm slice thickness when using 10mm and/or 20mm beam collimation respectively. However, when using 20mm and/or 40mm beam collimation, they are only capable of reconstructing to 1.25mm slice thickness.
2. MARS feature is not an option.
3. IQ Enhance feature requires thin slices (1.25mm or less) with an interval of half (or less). On older scanner models, in order to enable IQ Enhance at 0.625 mm slice thickness, the interval must be set to 0.311 mm instead

of 0.312 mm.

DentaScan 12.13/12.14/12.15

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Indication

Low Dose scan of Maxilla and Mandible. This exam is meant to replace a diagnostic Panorex X-ray. Indications include: 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.

Oral Contrast

None

Pre-Scan Instructions

- Positioning: Tilt the patient's head so that a line connecting the lateral canthus of the eye and the EAC is perpendicular to the CT tabletop (see below). The tip of the nose and both zygomatic bones must be on the scan.
- Remove all metallic and high-density objects from the scanning area.

IV Contrast Parameters

None

Field of View

Preferred 18cm FOV to include TMJs

Scan Description

- Series 1 – Scouts PA and Lateral
- Series 2 – CT DentaScan Without Contrast: Limited Coverage.
    - Start scan at the mandible and scan to the bottom of orbital floor. Be sure to include entire jaw, and both TMJs.

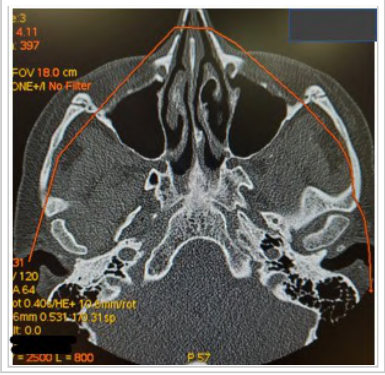
Reformat Instructions

All 2-D reformats described below are to be done as 2 mm x 1 mm reformats (see below)

- **Sagittal**: Be sure to include both TMJs.
- **Coronal**: From the anterior aspect of the mandible through the TMJs
- **Curved**: DentaScan Curved Reformat Instructions
- Load the Thin Bone series in reformat
- Change the top left port to curved. NOTE: The port will go black and say UNDEFINED CURVE.
- Under Display Tab, click on the rotate/translate button (See images above)
- Choose translate tab and change to 1 mm
- In the Axial port, scroll back and forth through the image. Find an image where you can see the entire jawline, most importantly both TMJs
- IF necessary, use the multi-oblique tool to properly align the jaw.
- Hold the shift key and use the left mouse button, to click points along the contour of the skin-line. (see reference image #1) Be sure to start/end beyond the TMJ's. Use as many points as you want. You may also hold the alt key, then the small green boxes become active and they can be moved to better fit along the skinline.

Scroll up and down in the axial port to ensure all the anatomy of the jaw will be included. (see reference images #3 and #4)
    - If you are clipping, or the image is coming out crooked, feel free to adjust your drop points anywhere in-between the skin-line and bony jawline. Keep in mind, the sharper the curve, the more distortion will be present in your reformat.
- Change window width/level to 2500/800 (I feel like this looks better/a little darker?)
- Click back in the curved box to make it active. Next click on batch, choose loop. Scroll to find the first image and click on set start, then scroll to find the last image and click on set end. Change the spacing to 1 mm. You can preview it if you wish. (see reference image #2)
- Series Description should be labeled: "Curved Reformat"
- Send reformat to PACS

Reference Images



Reformats

With or Without Contrast

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
CO ST	THIN ST	Manual	Average	450/50	2	1	Coronal
CO BONE	THIN BONE	Manual	Average	2500/350	2	1	Coronal
SA ST	THIN ST	Manual	Average	450/50	2	1	Sagittal
SA BONE	THIN BONE	Manual	Average	2500/350	2	1	Sagittal

Networking

- All Images to PACS (ALI_Store).
- Note: if smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

Acquisition Parameters

Series 1, Scout

	Infant	Child	Adolescent
Scout 1 kV	**80**	**100**	**120**
Scout 1 mA	**10**	**10**	**10**
Scout 1 Angle	**180**	**180**	**180**
Scout 2 kV	**80**	**100**	**120**
Scout 2 mA	**20**	**20**	**20**
Scout 2 Angle	**90**	**90**	**90**
WW/WL for Scout	**500/50**	**500/50**	**500/50**

Series 2, Scan Phase

	Infant	Child	Adolescent
Scan Type	**Helical**	**Helical**	**Helical**
Beam Collimation	**20**	**20**	**20**
Detector Rows	**32.0**	**32.0**	**32.0**
Detector Configuration	**32x0.625**	**32x0.625**	**32x0.625**
Scan FOV	**Head**	**Head**	**Head**
Pitch	**0.531**	**0.531**	**0.531**
Speed (mm/rot)	**10.60**	**10.60**	**10.60**
Rotation Time (s)	**0.5**	**0.5**	**0.5**
kV	**80**	**100**	**120**
AEC type	**smart mA**	**smart mA**	**smart mA**
mA Range	**(30-110)**	**(30-110)**	**(30-110)**
Manual mA	**50.0**	**50.0**	**50.0**
Noise Index	**13.6**	**13.6**	**13.6**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

Series 2, Recons

	Infant	Child	Adolescent
Recon 1 (Primary)			
DFOV	**14**	**14**	**14**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**400/30**	**400/30**	**400/30**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**80% / 40% / High**	**80% / 40% / High**	**80% / 40% / High**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**
Recon 2 (Secondary)			
DFOV	**14**	**14**	**14**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**2500/350**	**2500/350**	**2500/350**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**	**None**	**None**
Slice Thickness (mm)	**0.625**	**0.625**	**0.625**
Interval (mm)	**0.312**	**0.312**	**0.312**
Recon 3 (Secondary)			
DFOV	**14**	**14**	**14**
Recon Type	**Standard**	**Standard**	**Standard**
WW/WL	**400/30**	**400/30**	**400/30**
Recon Option	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
Recon Option	**MARS On**	**MARS On**	**MARS On**
ASiR/ASiR256/DLIR	**80% / 40% / High**	**80% / 40% / High**	**80% / 40% / High**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**

16 & 32 Slice Scanner Exceptions:

1. The 0.625mm slice thickness x 0.312mm interval Recon should be 1.25mm slice thickness x 0.625mm interval on 16 and 32 slice CT scanners. The 16 and 32 slice scanners are only able to recon down to 0.625mm slice thickness when using 10mm and/or 20mm beam collimation respectively. However, when using 20mm and/or 40mm beam collimation, they are only capable of reconstructing to 1.25mm slice thickness.
2. MARS feature is not an option.
3. IQ Enhance feature requires thin slices (1.25mm or less) with an interval of half (or less). On older scanner models, in order to enable IQ Enhance at 0.625 mm slice thickness, the interval must be set to 0.311 mm instead of 0.312 mm.

Pediatric Neck - Routine 13.1.1/13.4.1/13.8.1

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Indication

- Neck mass, globus sensation, lymphadenopathy, head and neck cancer evaluation/follow-up, pharyngitis, tonsillar or peritonsillar abscess, neck abscess.
- If the indication is for neck mass, especially for first time scans, please have patient place a BB on the palpable mass.
- GSI limited neck series will be requested by the Radiologist. This will be requested on patients to diagnosis head or neck cancer. See specific coverage options below.

Video for this protocol

Oral Contrast

None

Pre-Scan Instructions

- Patient supine, PA and lateral scouts from sella to mid chest (include the aortic arch), no gantry angle
- Have the patient remove any dentures or removable teeth, please place the shoulders as low possible
- Positioning: Tilt the patient's head so that a line connecting the lateral canthus of the eye and the EAC is perpendicular to the CT tabletop (see head CT protocol).
- Remove all metallic and high-density objects from the scanning area.
- If the indication is for neck mass, especially for first time scans, please have patient place a BB on the palpable mass.
- Right sided IV is always preferred (not required) for imaging of the neck due to contrast reflux into the brachiocephalic veins.
- Perform angled views if there are artifacts from dental fillings or metal hardware. Check with Radiologist before performing angled views on Pediatric patients, we rarely do these (see below)

IV Contrast Parameters 350

PEDIATRICS

Weight Ranges	Contrast Dosage	Injection Rate
0-80 kgs (0-175 lbs)	1.3 mL/kg (0.6 mL/lbs) Iohexol 350 mgI/mL + 20 mL NaCl flush	Contrast: 1.5 mL/sec NaCl flush: 1.5 mL/sec
Delay for Pediatrics: (0-6 Yrs) 45 sec after start of injection		

IV Contrast Parameters 300/370

PEDIATRICS

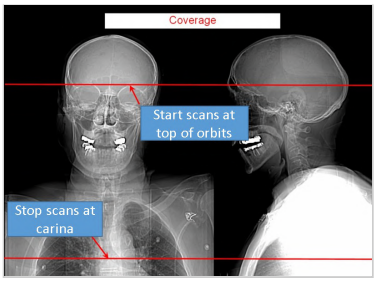
Weight Ranges	Contrast Dosage	Injection Rate
0-80 kgs (0-175 lbs)	1.5 mL/kg (0.7 mL/lbs) Iohexol 300 mgI/mL + 20 mL NaCl flush	Contrast: 1.5 mL/sec NaCl flush: 1.5 mL/sec
Delay for Pediatrics: 45 sec after start of injection		

Field of View

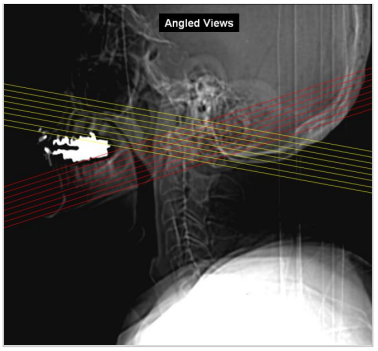
Preferred 30 cm

Scan Description

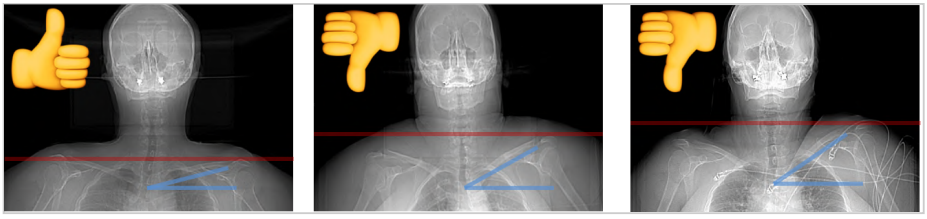
- **Series 1** – Scouts PA and Lateral
- **Series 2** – Neck with Contrast: Start the scan at the top of the orbits and scan to the carina. Remind the patient not to swallow during the scan.
  - Timing: 45 seconds after the start of injection. This prep delays is built into the protocol. NOTE: If scanning a NECK C/A/P please reduce Prep Delay to 20 seconds due to smaller contrast bolus.
- **Series 3** - Angled Axials- If there is a significant amount of metal artifact from dental work, perform angled axials at 2 different angels. (see below picture)



scan range for neck



Angled Views



Examples of good and bad shoulder position relative to the neck. The techniques listed above can get a patient from having a poor positioning of the shoulder to a good position. Note: try to recognize improper shoulder relaxation before you scout. If, however, you only notice this after you scout, there is no need to re-scout the patient after they move their shoulders.

NOTE - if the patient has lymphoma and the study is a follow-up, use the small neck protocol (regardless of the patients actual size) since it will provide a lower dose

- Verify that the arms are outside of the CT wrap, and that the shoulders are relaxed down toward the feet as far as possible. Measure the width of the shoulders through the level of the mid-humeral head, as shown below.
- Select small, medium and large based on the table below.

Size Bin	Small	Medium	Large
Measure width through mid-humeral heads	Pink, Red/Purple (Newborn- 2.5 yrs)	Yellow/White, Blue/Orange (3-12 yrs)	Green/Black (13-18 yrs)
	Shoulder width 10-24 cm	Shoulder Width 25-33 cm	Shoulder width 34-45cm

Reformat Instructions

- Reformats should cover from the tip of the nose through the back of the neck.
- Only send STD AND BONE to PACS. Use THIN ST for the soft tissue Reformats. Use THIN BONE for the bone Reformats.**For the soft tissue: Perform 2D reformats from Recon 3 in both the coronal and sagittal planes, using a 3 mm thickness and 1.5 mm increment.
- For bone: Perform 2D reformats from THIN BONE for both the coronal and sagittal planes, using a 1.5 mm thickness and 0.75 mm increment.

Reformats

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
CO ST	Thin ST	Manual	Average	400/60	3	1.5	Coronal
CO BONE	Thin Bone	Manual	Average	2500/350	1.5	0.75	Coronal
SA ST	Thin ST	Manual	Average	400/60	3	1.5	Sagittal
SA BONE	Thin Bone	Manual	Average	2500/350	1.5	0.75	Sagittal

Networking

- All Images to PACS (ALI_Store).
- Note: if smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

Miscellaneous

None

Acquisition Parameters

Series 1, Scout

	Pink/Newborn/10-24cm	Red Purple/6 mo.-2.5 years/10-24cm	Yellow White/3-7 years/25-33 cm	Blue Orange/8-12 years/25-33 cm	Green Black/13-18 years/34-45 cm
Scout 1 kV	80	80	100	100	120
Scout 1 mA	10	10	10	10	10
Scout 1 Angle	180	180	180	180	180
Scout 2 kV	80	80	100	100	120
Scout 2 mA	40	40	40	40	40
Scout 2 Angle	90	90	90	90	90
WW/WL for Scout	500/50	500/50	500/50	500/50	500/50

Series 2, Scan Phase

	Pink/Newborn/10-24cm	Red Purple/6 mo.-2.5 years/10-24cm	Yellow White/3-7 years/25-33 cm	Blue Orange/8-12 years/25-33 cm	Green Black/13-18 years/34-45 cm
Scan Type	**Helical**	**Helical**	**Helical**	**Helical**	**Helical**
Beam Collimation	**20**	**20**	**20**	**20**	**20**
Detector Rows	**32.0**	**32.0**	**32.0**	**32.0**	**32.0**
Detector Configuration	**32x0.625**	**32x0.625**	**32x0.625**	**32x0.625**	**32x0.625**
Scan FOV	**Small Body**	**Small Body**	**Large Body**	**Large Body**	**Large Body**
Pitch	**0.969**	**0.969**	**0.531**	**0.531**	**0.531**
Speed (mm/rot)	**19.40**	**19.40**	**10.60**	**10.60**	**10.60**
Rotation Time (s)	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**
kV	**80**	**80**	**80**	**80**	**100**
AEC type	**smart mA**	**smart mA**	**smart mA**	**smart mA**	**smart mA**
mA Range	**(100-180)**	**(100-180)**	**(180-340)**	**(180-340)**	**(220-420)**
Manual mA	**140.0**	**140.0**	**260.0**	**260.0**	**340.0**
Noise Index	**11.7**	**11.7**	**15.0**	**15.0**	**14.6**
Slice Thickness (mm)	**2.5**	**2.5**	**2.5**	**2.5**	**2.5**
Interval (mm)	**1.5**	**1.5**	**1.5**	**1.5**	**1.5**

Series 2, Recons

	Pink/Newborn/10-24cm	Red Purple/6 mo.-2.5 years/10-24cm	Yellow White/3-7 years/25-33 cm	Blue Orange/8-12 years/25-33 cm	Green Black/13-18 years/34-45 cm
Recon 1 (Primary)					
DFOV	30	30	30	30	30
Recon Type	Standard	Standard	Standard	Standard	Standard
WW/WL	300/35	300/35	300/35	300/35	300/35
Recon Option	Plus	Plus	Plus	Plus	Plus
Recon Option					
ASiR/ASiR256/DLIR	60% / 30% / Medium	60% / 30% / Medium	60% / 30% / Medium	60% / 30% / Medium	60% / 30% / Medium
Slice Thickness (mm)	2.5	2.5	2.5	2.5	2.5
Interval (mm)	1.5	1.5	1.5	1.5	1.5
Recon 2 (Secondary)					
DFOV	22	22	22	22	22
Recon Type	Bone Plus	Bone Plus	Bone Plus	Bone Plus	Bone Plus
WW/WL	2500/350	2500/350	2500/350	2500/350	2500/350
Recon Option	Plus	Plus	Plus	Plus	Plus
Recon Option	IQ Enhance	IQ Enhance	IQ Enhance	IQ Enhance	IQ Enhance
ASiR/ASiR256/DLIR	None	None	None	None	None
Slice Thickness (mm)	1.25	1.25	1.25	1.25	1.25
Interval (mm)	0.625	0.625	0.625	0.625	0.625
Recon 3 (Secondary)					
DFOV	30	30	30	30	30
Recon Type	Standard	Standard	Standard	Standard	Standard
WW/WL	300/35	300/35	300/35	300/35	300/35
Recon Option	Plus	Plus	Plus	Plus	Plus
Recon Option	IQ Enhance	IQ Enhance	IQ Enhance	IQ Enhance	IQ Enhance
ASiR/ASiR256/DLIR	80% / 40% / High	80% / 40% / High	80% / 40% / High	80% / 40% / High	80% / 40% / High
Slice Thickness (mm)	1.25	1.25	1.25	1.25	1.25
Interval (mm)	0.625	0.625	0.625	0.625	0.625
Recon 4 (Secondary)					
DFOV	30	30	30	30	30
Recon Type	Bone Plus	Bone Plus	Bone Plus	Bone Plus	Bone Plus
WW/WL	2500/350	2500/350	2500/350	2500/350	2500/350
Recon Option	Plus	Plus	Plus	Plus	Plus
Recon Option	IQ Enhance	IQ Enhance	IQ Enhance	IQ Enhance	IQ Enhance
ASiR/ASiR256/DLIR	None	None	None	None	None
Slice Thickness (mm)	0.625	0.625	0.625	0.625	0.625
Interval (mm)	0.312	0.312	0.312	0.312	0.312

16 & 32 Slice Scanner Exceptions:

1. The 0.625mm slice thickness x 0.312mm interval Recon should be 1.25mm slice thickness x 0.625mm interval on 16 and 32 slice CT scanners. The 16 and 32 slice scanners are only able to recon down to 0.625mm slice thickness when using 10mm and/or 20mm beam collimation respectively. However, when using 20mm and/or 40mm beam collimation, they are only capable of reconstructing to 1.25mm slice thickness.
2. MARS feature is not an option.
3. IQ Enhance feature requires thin slices (1.25mm or less) with an interval of half (or less). On older scanner models, in order to enable IQ Enhance at 0.625 mm slice thickness, the interval must be set to 0.311 mm instead of 0.312 mm.

DLIR Limitations:

1. DLIR is not available on the Primary Recon.
2. DLIR is only compatible with the Standard Algorithm. So, in instances where the primary recon is Soft algorithm,(i.e. many Neuro Protocols) the subsequent recons will be in Standard Algorithm to enable DLIR. The

slight difference between the Soft and Standard Algorithms is outweighed by the improvement in image quality with DLIR enabled.

3. DLIR requires an interval exactly half of the slice thickness.
4. DLIR doesn't allow an interval of 0.312 mm. So, if you are on a DLIR enabled scanner, the thin 0.625 recon will be at 0.625x0.625 mm. On all other scanners the thin recon will be at 0.625x0.312 mm.

Series 3, Scan Phase

	Pink/Newborn/10-24cm	Red Purple/6 mo.-2.5 years/10-24cm	Yellow White/3-7 years/25-33 cm	Blue Orange/8-12 years/25-33 cm	Green Black/13-18 years/34-45 cm
Scan Type	**Axial**	**Axial**	**Axial**	**Axial**	**Axial**
Beam Collimation	**20**	**20**	**20**	**20**	**20**
Detector Rows	**32.0**	**32.0**	**32.0**	**32.0**	**32.0**
Detector Configuration	**32x0.625**	**32x0.625**	**32x0.625**	**32x0.625**	**32x0.625**
Scan FOV	**Small Body**	**Small Body**	**Small Body**	**Large Body**	**Large Body**
Pitch	**1**	**1**	**1**	**1**	**1**
Speed (mm/rot)	**20.00**	**20.00**	**20.00**	**20.00**	**20.00**
Rotation Time (s)	**1**	**1**	**1**	**1**	**1**
kV	**80**	**80**	**80**	**100**	**100**
AEC type	**Manual mA**	**Manual mA**	**Manual mA**	**Manual mA**	**Manual mA**
mA Range	**(120-400)**	**(120-400)**	**(120-400)**	**(120-480)**	**(120-480)**
Manual mA	**290.0**	**290.0**	**290.0**	**290.0**	**290.0**
Noise Index	**4.8**	**4.8**	**4.8**	**4.8**	**4.8**
Slice Thickness (mm)	**2.5**	**2.5**	**2.5**	**2.5**	**2.5**
Interval (mm)	**20**	**20**	**20**	**20**	**20**

Series 3, Recons

	Pink/Newborn/10-24 cm	Red Purple/6 mo.-2.5 years/10-24 cm	Yellow White/3-7 years/25-33 cm	Blue Orange/8-12 years/25-33 cm	Green Black/13-18 years/34-45 cm
Recon 1 (Primary)					
DFOV	**22**	**22**	**22**	**22**	**22**
Recon Type	**Standard**	**Standard**	**Standard**	**Standard**	**Standard**
WW/WL	**300/35**	**300/35**	**300/35**	**300/35**	**300/35**
Recon Option	**Full**	**Full**	**Full**	**Full**	**Full**
Recon Option					
ASiR/ASiR256/DLIR	**60% / 30% / Medium**	**60% / 30% / Medium**	**60% / 30% / Medium**	**60% / 30% / Medium**	**60% / 30% / Medium**
Slice Thickness (mm)	**2.5**	**2.5**	**2.5**	**2.5**	**2.5**
Interval (mm)	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**
Recon 2 (Secondary)					
DFOV	**22**	**22**	**22**	**22**	**22**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**2500/350**	**2500/350**	**2500/350**	**2500/350**	**2500/350**
Recon Option	**Full**	**Full**	**Full**	**Full**	**Full**
Recon Option					
ASiR/ASiR256/DLIR	**None**	**None**	**None**	**None**	**None**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**
Interval (mm)	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**

Pediatric Cervical Spine 13.1.4/13.4.4/13.8.4

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Indication

Trauma, neck pain, cervical stenosis, radiculopathy, fracture, evaluate ixation hardware

Video for this protocol

Oral Contrast

None

Pre-Scan Instructions

- Extend the scouts to include the aortic arch for smart prep if IV contrast is to be used.
- Patient Positioning:
  - Warning: Do not flex or extend the neck if there has been recent spine trauma or if the patient is in a C-Spine trauma collar.
  - If no recent trauma, tilt the patient's head so that a line connecting the lateral canthus of the eye and the EAC is perpendicular to the CT tabletop.
  - The shoulders should be pulled down as much as possible
- Remove all metallic and high-density objects from the scanning area.
- Post T and L Spine Myelogram patients: Please remember to roll the patient 360 degrees before scanning in order to distribute the contrast evenly in the spinal canal.

IV Contrast Parameters 350

Weight Ranges	Contrast Dosage	Injection Rate
0-80 kg (0-175 lbs)	1.3 mL/kg (0.6 mL/lbs) of Iohexol 350 mgI/mL	2 mL/sec

IV Contrast Parameters 300/370

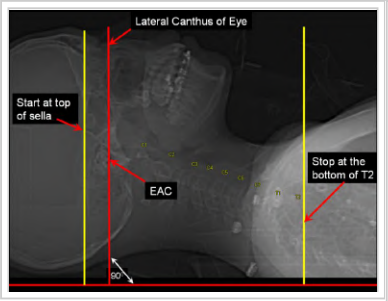
Weight Ranges	Contrast Dosage	Injection Rate
0-80 kg (0-175 lbs)	1.5 mL/kg (0.7 mL/lbs) of Iohexol 300 mgI/mL	2 mL/sec

Field of View

Preferred 16cm

Scan Description

- Series 1 – Scouts PA and Lateral
- Series 2 – CT Cspine without: Scan from the top of the sella to the bottom of T2
- Series 3 - CT Cspine with: Scan from the top of the sella to the bottom of T2
  - Smart Prep: Place ROI on the aortic arch.
    - CT scan delay after arrival of contrast in aortic arch:
    - 8 sec (16 slice scanners), 10 sec (64 slice scanners)

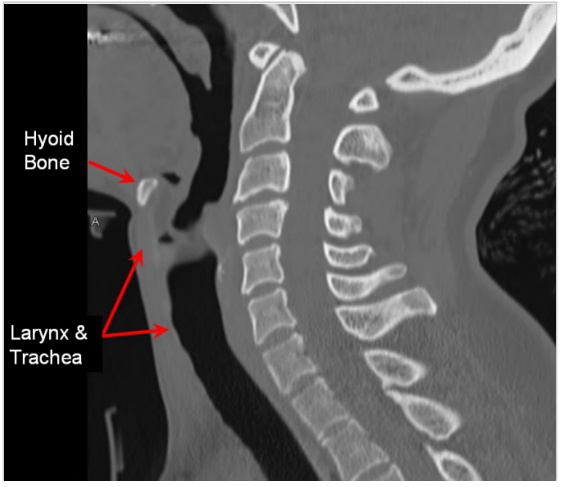


- Select small, medium or large based on the table below

Size Bin	Small	Medium	Large
Measure width through mid-humeral heads	Pink, Red/Purple (Newborn- 2.5 yrs)	Yellow/White, Blue/Orange (3-12 yrs)	Green/Black (13-18 yrs)
	Shoulder width 10-24 cm	Shoulder Width 25-33 cm	Shoulder width 34-45cm

Reformat Instructions

- If the patient has a lot of metal in their teeth please use the MARS recons for the reformats. MAR is enabled on Adult protocols and Adolescent protocols (ages 7 -17 yrs.).
- If this is an exam solely With contrast or solely Without contrast: Please perform 2D-reformats using both the ST AND the THIN BONE.
- If this is a "With & Without" contrast study: Please perform 2D reformats using ST from the With contrast series and THIN BONE from Non-Contrast series.



Reformats

With or Without Contrast

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
CO ST	Thin ST	Manual	Average	450/50	3	1.5	Coronal
CO BONE	Thin Bone	Manual	Average	2500/350	1.5	0.75	Coronal
SA ST	Thin ST	Manual	Average	450/50	3	1.5	Sagittal
SA BONE	Thin Bone	Manual	Average	2500/350	1.5	0.75	Sagittal

With and Without Contrast

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
CO ST	THIN ST (with contrast phase)	Manual	Average	450/50	3	1.5	Coronal
CO BONE	THIN BONE (without contrast phase)	Manual	Average	2500/350	1.5	0.75	Coronal
SA ST	THIN ST (with contrast phase)	Manual	Average	450/50	3	1.5	Sagittal
SA BONE	THIN BONE (without contrast phase)	Manual	Average	2500/350	1.5	0.75	Sagittal

Networking

- All Images to PACS (ALI_Store). Do not send Thin Bone, these recons are made solely to build reformats from.
- If Metal is present, send THIN ST MAR and build reformats from that series.
- Note: if smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

Miscellaneous

None

Acquisition Parameters

Series 1, Scout

	Pink/Newborn/10-24 cm	Red Purple/6 mo.-2.5 years/10-24 cm	Yellow White/3-7 years/25-33 cm	Blue Orange/8-12 years/25-33 cm	Green Black/13-18 years/34-45 cm
Scout 1 kV	80	80	100	100	120
Scout 1 mA	10	10	10	10	10
Scout 1 Angle	180	180	180	180	180
Scout 2 kV	80	80	100	100	120
Scout 2 mA	40	40	40	40	40
Scout 2 Angle	90	90	90	90	90
WW/WL for Scout	500/50	500/50	500/50	500/50	500/50

Series 2, Scan Phase

	Pink/Newborn/10-24 cm	Red Purple/6 mo.-2.5 years/10-24 cm	Yellow White/3-7 years/25-33 cm	Blue Orange/8-12 years/25-33 cm	Green Black/13-18 years/34-45 cm
Scan Type	Helical	Helical	Helical	Helical	Helical
Beam Collimation	20	20	20	20	20
Detector Rows	32.0	32.0	32.0	32.0	32.0
Detector Configuration	32x0.625	32x0.625	32x0.625	32x0.625	32x0.625
Scan FOV	Small Body	Small Body	Large Body	Large Body	Large Body
Pitch	0.969	0.969	0.969	0.969	0.531
Speed (mm/rot)	19.40	19.40	19.40	19.40	10.60
Rotation Time (s)	0.5	0.5	0.5	0.5	0.5
kV	80	80	100	100	120
AEC type	smart mA	smart mA	smart mA	smart mA	smart mA
mA Range	(100-180)	(100-180)	(230-420)	(230-420)	(180-340)
Manual mA	140.0	140.0	330.0	330.0	270.0
Noise Index	16.6	16.6	16.8	16.8	17.1
Slice Thickness (mm)	1.25	1.25	1.25	1.25	1.25
Interval (mm)	0.625	0.625	0.625	0.625	0.625

Series 2, Recons

	Pink/Newborn/10-24 cm	Red Purple/6 mo.-2.5 years/10-24 cm	Yellow White/3-7 years/25-33 cm	Blue Orange/8-12 years/25-33 cm	Green Black/13-18 years/34-45 cm
Recon 1 (Primary)					
DFOV	**16**	**16**	**16**	**16**	**16**
Recon Type	**Soft**	**Soft**	**Soft**	**Soft**	**Soft**
WW/WL	**450/50**	**450/50**	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**60% / 30% / High**	**60% / 30% / High**	**60% / 30% / High**	**60% / 30% / High**	**60% / 30% / High**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**	**0.625**	**0.625**
Recon 2 (Secondary)					
DFOV	**16**	**16**	**16**	**16**	**16**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**2500/350**	**2500/350**	**2500/350**	**2500/350**	**2500/350**
Recon Option	**Plus**	**Plus**	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**	**None**	**None**	**None**	**None**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**	**0.625**	**0.625**
Recon 3 (Secondary)					
DFOV	**16**	**16**	**16**	**16**	**16**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**2500/350**	**2500/350**	**2500/350**	**2500/350**	**2500/350**
Recon Option	**Plus**	**Plus**	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**	**None**	**None**	**None**	**None**
Slice Thickness (mm)	**0.625**	**0.625**	**0.625**	**0.625**	**0.625**
Interval (mm)	**0.312**	**0.312**	**0.312**	**0.312**	**0.312**

If metal is present, also provide the physician with these recons. (note, not all GE scanners have MARS, and MARS only works at helical pitches below 1)

	All Sizes
Recon 4 (Secondary)	
DFOV	**16**
Recon Type	**Soft**
WW/WL	**450/50**
Recon Option	**Plus**
Recon Option	**IQ Enhance**
Recon Option	**MARS On**
ASiR/ASiR256/DLIR	**60% / 30% / High**
Slice Thickness (mm)	**1.25**
Interval (mm)	**0.625**

16 & 32 Slice Scanner Exceptions:

1. The 0.625mm slice thickness x 0.312mm interval Recon should be 1.25mm slice thickness x 0.625mm interval on 16 and 32 slice CT scanners. The 16 and 32 slice scanners are only able to recon down to 0.625mm slice thickness when using 10mm and/or 20mm beam collimation respectively. However, when using 20mm and/or 40mm beam collimation, they are only capable of reconstructing to 1.25mm slice thickness.
2. MARS feature is not an option.
3. IQ Enhance feature requires thin slices (1.25mm or less) with an interval of half (or less). On older scanner models, in order to enable IQ Enhance at 0.625 mm slice thickness, the interval must be set to 0.311 mm instead of 0.312 mm.

DLIR Limitations:

1. DLIR is not available on the Primary Recon.
2. DLIR is only compatible with the Standard Algorithm. So, in instances where the primary recon is Soft algorithm,(i.e. many Neuro Protocols) the subsequent recons will be in Standard Algorithm to enable DLIR. The slight difference between the Soft and Standard Algorithms is outweighed by the improvement in image quality with DLIR enabled.
3. DLIR requires an interval exactly half of the slice thickness.
4. DLIR doesn't allow an interval of 0.312 mm. So, if you are on a DLIR enabled scanner, the thin 0.625 recon will be at 0.625x0.625 mm. On all other scanners the thin recon will be at 0.625x0.312 mm.

Series 3, Smart Prep

	Pink/Newborn/10-24 cm	Red Purple/6 mo.-2.5 years/10-24 cm	Yellow White/3-7 years/25-33 cm	Blue Orange/8-12 years/25-33 cm	Green Black/13-18 years/34-45 cm
mA	**40**	**40**	**40**	**40**	**40**
Monitoring Delay (sec)	**10**	**10**	**10**	**10**	**10**
Monitoring ISD (sec)	**3.0**	**3.0**	**3.0**	**3.0**	**3.0**
Enhancement Threshold (HU)	**50**	**50**	**50**	**50**	**50**
Diagnostic Delay	**10**	**10**	**10**	**10**	**10**

Series 3, Scan Phase

	Pink/Newborn/10-24 cm	Red Purple/6 mo.-2.5 years/10-24 cm	Yellow White/3-7 years/25-33 cm	Blue Orange/8-12 years/25-33 cm	Green Black/13-18 years/34-45 cm
Scan Type	**Helical**	**Helical**	**Helical**	**Helical**	**Helical**
Beam Collimation	**20**	**20**	**20**	**20**	**20**
Detector Rows	**32.0**	**32.0**	**32.0**	**32.0**	**32.0**
Detector Configuration	**32x0.625**	**32x0.625**	**32x0.625**	**32x0.625**	**32x0.625**
Scan FOV	**Small Body**	**Small Body**	**Large Body**	**Large Body**	**Large Body**
Pitch	**0.969**	**0.969**	**0.969**	**0.969**	**0.531**
Speed (mm/rot)	**19.40**	**19.40**	**19.40**	**19.40**	**10.60**
Rotation Time (s)	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**
kV	**80**	**80**	**100**	**100**	**120**
AEC type	**smart mA**	**smart mA**	**smart mA**	**smart mA**	**smart mA**
mA Range	**(100-180)**	**(100-180)**	**(230-420)**	**(230-420)**	**(180-340)**
Manual mA	**140.0**	**140.0**	**330.0**	**330.0**	**270.0**
Noise Index	**16.6**	**16.6**	**16.8**	**16.8**	**17.1**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**	**0.625**	**0.625**

Series 3, Recons

	Pink/Newborn/10-24 cm	Red Purple/6 mo.-2.5 years/10-24 cm	Yellow White/3-7 years/25-33 cm	Blue Orange/8-12 years/25-33 cm	Green Black/13-18 years/34-45 cm
Recon 1 (Primary)					
DFOV	**16**	**16**	**16**	**16**	**16**
Recon Type	**Soft**	**Soft**	**Soft**	**Soft**	**Soft**
WW/WL	**450/50**	**450/50**	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**60% / 30% / High**	**60% / 30% / High**	**60% / 30% / High**	**60% / 30% / High**	**60% / 30% / High**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**	**0.625**	**0.625**
Recon 2 (Secondary)					
DFOV	**16**	**16**	**16**	**16**	**16**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**2500/350**	**2500/350**	**2500/350**	**2500/350**	**2500/350**
Recon Option	**Plus**	**Plus**	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**	**None**	**None**	**None**	**None**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**	**0.625**	**0.625**
Recon 3 (Secondary)					
DFOV	**16**	**16**	**16**	**16**	**16**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**2500/350**	**2500/350**	**2500/350**	**2500/350**	**2500/350**
Recon Option	**Plus**	**Plus**	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**	**None**	**None**	**None**	**None**
Slice Thickness (mm)	**0.625**	**0.625**	**0.625**	**0.625**	**0.625**
Interval (mm)	**0.312**	**0.312**	**0.312**	**0.312**	**0.312**

16 & 32 Slice Scanner Exceptions:

1. The 0.625mm slice thickness x 0.312mm interval Recon should be 1.25mm slice thickness x 0.625mm interval on 16 and 32 slice CT scanners. The 16 and 32 slice scanners are only able to recon down to 0.625mm slice thickness when using 10mm and/or 20mm beam collimation respectively. However, when using 20mm and/or 40mm beam collimation, they are only capable of reconstructing to 1.25mm slice thickness.
2. MARS feature is not an option.
3. IQ Enhance feature requires thin slices (1.25mm or less) with an interval of half (or less). On older scanner models, in order to enable IQ Enhance at 0.625 mm slice thickness, the interval must be set to 0.311 mm instead of 0.312 mm.

DLIR Limitations:

1. DLIR is not available on the Primary Recon.
2. DLIR is only compatible with the Standard Algorithm. So, in instances where the primary recon is Soft algorithm,(i.e. many Neuro Protocols) the subsequent recons will be in Standard Algorithm to enable DLIR. The slight difference between the Soft and Standard Algorithms is outweighed by the improvement in image quality with DLIR enabled.
3. DLIR requires an interval exactly half of the slice thickness.
4. DLIR doesn't allow an interval of 0.312 mm. So, if you are on a DLIR enabled scanner, the thin 0.625 recon will be at 0.625x0.625 mm. On all other scanners the thin recon will be at 0.625x0.312 mm.

Pediatric Lumbar Spine 17.1.1/17.2.1/17.4.1/17.6.1/17.8.1/

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Indication

Trauma, neck pain, lumbar stenosis, radiculopathy, fracture, evaluate fixation hardware

Oral Contrast

None

Pre-Scan Instructions

- Extend the scouts to include the aortic arch for smart prep if IV contrast is to be used.
- Remove all metallic and high-density objects from the scanning area.
- Scan from the top of T12 to the top of S2
- Post myelography patients: Please remember to roll the patient 360 degrees before scanning to distribute the contrast evenly in the spinal canal.
- **Only if both CT T and L Spines are ordered**
  - Please start scanning T and L Spines together (scanning acquisition parameters are identical so we will be saving the patients some radiation dose due to avoiding any overlap).
  - Do separate coronal and sagittal reformats and send to PACS as 2 different exams using exam split.
  - Axial images of the entire Spine (T and L) should be sent to both T and L Spine exams. Sagittal and coronal reformats for the T-Spine should go from C7 to L1, and the sag and cor reformats from the L-Spine go from T12 to S2.
  - Also include the entire T/L Spine sagittal reformat. Do not include a coronal reformat of the entire T/L Spine.

IV Contrast Parameters 350

Weight Ranges	Contrast Dosage	Injection Rate
0-62 kgs (0-137 lbs)	1.3 mL/kg (0.6 mL/lbs) Iohexol 350 mgI/mL	2 mL/sec
> 63 kgs (137 lbs)	Weight based Medrad P3T or UW ConCal Routine Peds protocol	2 mL/sec

IV Contrast Parameters 300/370

Weight Ranges	Contrast Dosage	Injection Rate
0-80 kgs (0-175 lbs)	1.5 mL/kg (0.7 mL/lbs) Iohexol 300 mgI/mL	2 mL/sec

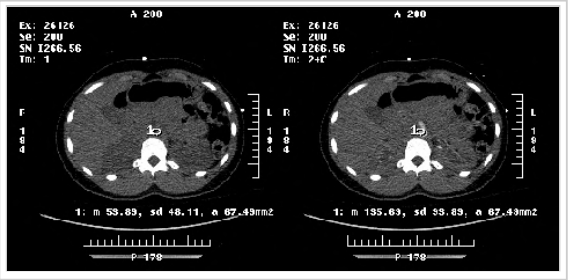
Field of View

Preferred 16cm

Scan Description

- Series 1 – Scouts PA and Lateral
- Series 2 – CT L-Spine without: Scan from the top of T12 to the top of S2
- Series 3 - CT L-Spine with: Scan from the top of T12 to the top of S2
  - Smart Prep: Place ROI on the abdominal aorta.
    - CT scan delay after arrival of contrast in abdominal aorta:

- 8 sec (16 slice scanners), 10 sec (64 slice scanners) These diagnostic delays are built into the protocol.



Reformat Instructions

- Do not send the 0.625 mm bone images (Recon 2) to PACS
- Do 2 x 1 mm coronal and sagittal 2D-reformats.
- If exam is solely with contrast or solely without contrast: Do 2D-reformats using both the standard 1.25 mm images (Recon 1) AND the bone 0.625 mm images (Recon 2)
- If this is a “with & without” contrast study: Do not do Recons 2 and 3 on the non-contrast part
- If this is a “with & without” contrast study: Do 2D-reformats only from the contrast portion of the study using standard 1.25 mm images (Recon 1) AND bone 0.625 mm images (Recon 2)

Reformats

With or Without Contrast

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
CO ST	Thin ST	Manual	Average	450/50	2	1	Coronal
CO BONE	Thin Bone	Manual	Average	2500/350	2	1	Coronal
SA ST	Thin ST	Manual	Average	450/50	2	1	Sagittal
SA BONE	Thin Bone	Manual	Average	2500/350	2	1	Sagittal

With and Without Contrast

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
CO ST	THIN ST (with contrast phase)	Manual	Average	450/50	2	1	Coronal
CO BONE	THIN BONE (with contrast phase)	Manual	Average	2500/350	2	1	Coronal
SA ST	THIN ST (with contrast phase)	Manual	Average	450/50	2	1	Sagittal
SA BONE	THIN BONE (with contrast phase)	Manual	Average	2500/350	2	1	Sagittal

Networking

- All Images to PACS (ALI_Store). Do not send Thin Bone, these recons are made solely to build reformats from.
- If Metal is present, send THIN ST MAR and build reformats from that series.
- Note: if smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

Miscellaneous

None

Acquisition Parameters

Series 1, Scout

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-60 cm
Scout 1 kV	**80**	**80**	**80**	**80**	**100**
Scout 1 mA	**10**	**10**	**10**	**10**	**10**
Scout 1 Angle	**180**	**180**	**180**	**180**	**180**
Scout 2 kV	**80**	**80**	**80**	**80**	**100**
Scout 2 mA	**40**	**40**	**40**	**40**	**40**
Scout 2 Angle	**90**	**90**	**90**	**90**	**90**
WW/WL for Scout	**500/50**	**500/50**	**500/50**	**500/50**	**500/50**

Series 2, Scan Phase

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-60 cm
Scan Type	**Helical**	**Helical**	**Helical**	**Helical**	**Helical**
Beam Collimation	**20**	**20**	**20**	**40**	**40**
Detector Rows	**32.0**	**32.0**	**32.0**	**64.0**	**64.0**
Detector Configuration	**32x0.625**	**32x0.625**	**32x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Small Body**	**Small Body**	**Small Body**	**Large Body**	**Large Body**
Pitch	**0.516**	**0.516**	**0.516**	**0.516**	**0.516**
Speed (mm/rot)	**10.30**	**10.30**	**10.30**	**20.60**	**20.60**
Rotation Time (s)	**0.5**	**0.5**	**0.5**	**0.6**	**0.8**
kV	**80**	**80**	**80**	**80**	**100**
AEC type	**smart mA**	**smart mA**	**smart mA**	**smart mA**	**smart mA**
mA Range	**(10-60)**	**(15-80)**	**(20-130)**	**(35-230)**	**(35-210)**
Manual mA	**40.0**	**50.0**	**80.0**	**140.0**	**140.0**
Noise Index	**14.5**	**16.5**	**18.5**	**21.5**	**20.5**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**	**0.625**	**0.625**

Series 2, Recons

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-60 cm
Recon 1 (Primary)					
DFOV	**16**	**16**	**16**	**16**	**16**
Recon Type	**Soft**	**Soft**	**Soft**	**Soft**	**Soft**
WW/WL	**450/50**	**450/50**	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**60% / 30% / High**	**60% / 30% / High**	**60% / 30% / High**	**60% / 30% / High**	**60% / 30% / High**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**	**0.625**	**0.625**
Recon 2 (Secondary)					
DFOV	**16**	**16**	**16**	**16**	**16**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**2500/350**	**2500/350**	**2500/350**	**2500/350**	**2500/350**
Recon Option	**Plus**	**Plus**	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**	**None**	**None**	**None**	**None**
Slice Thickness (mm)	**0.625**	**0.625**	**0.625**	**0.625**	**0.625**
Interval (mm)	**0.312**	**0.312**	**0.312**	**0.312**	**0.312**
Recon 3 (Secondary)					
DFOV	**16**	**16**	**16**	**16**	**16**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**2500/350**	**2500/350**	**2500/350**	**2500/350**	**2500/350**
Recon Option	**Plus**	**Plus**	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**	**None**	**None**	**None**	**None**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**	**0.625**	**0.625**

If metal is present, also provide the physician with these recons. (note, not all GE scanners have MARS, and MARS only works at helical pitches below 1)

	All Sizes
Recon 4 (Secondary)	
DFOV	**16**
Recon Type	**Soft**
WW/WL	**450/50**
Recon Option	**Plus**
Recon Option	**IQ Enhance**
Recon Option	**MARS On**
ASiR/ASiR256/DLIR	**60% / 30% / High**
Slice Thickness (mm)	**1.25**
Interval (mm)	**0.625**

16 & 32 Slice Scanner Exceptions:

1. The 0.625mm slice thickness x 0.312mm interval Recon should be 1.25mm slice thickness x 0.625mm interval on 16 and 32 slice CT scanners. The 16 and 32 slice scanners are only able to recon down to 0.625mm slice thickness when using 10mm and/or 20mm beam collimation respectively. However, when using 20mm and/or 40mm beam collimation, they are only capable of reconstructing to 1.25mm slice thickness.
2. MARS feature is not an option.
3. IQ Enhance feature requires thin slices (1.25mm or less) with an interval of half (or less). On older scanner models, in order to enable IQ Enhance at 0.625 mm slice thickness, the interval must be set to 0.311 mm instead of 0.312 mm.

DLIR Limitations:

1. DLIR is not available on the Primary Recon.
2. DLIR is only compatible with the Standard Algorithm. So, in instances where the primary recon is Soft algorithm,(i.e. many Neuro Protocols) the subsequent recons will be in Standard Algorithm to enable DLIR. The slight difference between the Soft and Standard Algorithms is outweighed by the improvement in image quality with DLIR enabled.
3. DLIR requires an interval exactly half of the slice thickness.
4. DLIR doesn't allow an interval of 0.312 mm. So, if you are on a DLIR enabled scanner, the thin 0.625 recon will be at 0.625x0.625 mm. On all other scanners the thin recon will be at 0.625x0.312 mm.

Series 3, Smart Prep

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-60 cm
mA	**10**	**10**	**10**	**10**	**10**
Monitoring Delay (sec)	**20**	**20**	**20**	**20**	**20**
Monitoring ISD (sec)	**2.0**	**2.0**	**2.0**	**2.0**	**2.0**
Enhancement Threshold (HU)	**50**	**50**	**50**	**50**	**50**
Diagnostic Delay	**10**	**10**	**10**	**10**	**10**

Series 3, Scan Phase

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-60 cm
Scan Type	**Helical**	**Helical**	**Helical**	**Helical**	**Helical**
Beam Collimation	**20**	**20**	**20**	**40**	**40**
Detector Rows	**32.0**	**32.0**	**32.0**	**64.0**	**64.0**
Detector Configuration	**32x0.625**	**32x0.625**	**32x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Small Body**	**Small Body**	**Small Body**	**Large Body**	**Large Body**
Pitch	**0.516**	**0.516**	**0.516**	**0.516**	**0.516**
Speed (mm/rot)	**10.30**	**10.30**	**10.30**	**20.60**	**20.60**
Rotation Time (s)	**0.5**	**0.5**	**0.5**	**0.6**	**0.8**
kV	**80**	**80**	**80**	**80**	**100**
AEC type	**smart mA**	**smart mA**	**smart mA**	**smart mA**	**smart mA**
mA Range	**(10-60)**	**(15-80)**	**(20-130)**	**(35-230)**	**(35-210)**
Manual mA	**40.0**	**50.0**	**80.0**	**140.0**	**140.0**
Noise Index	**14.5**	**16.5**	**18.5**	**21.5**	**20.5**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**	**0.625**	**0.625**

Series 3, Recons

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-60 cm
Recon 1 (Primary)					
DFOV	**16**	**16**	**16**	**16**	**16**
Recon Type	**Soft**	**Soft**	**Soft**	**Soft**	**Soft**
WW/WL	**450/50**	**450/50**	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**60% / 30% / High**	**60% / 30% / High**	**60% / 30% / High**	**60% / 30% / High**	**60% / 30% / High**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**	**0.625**	**0.625**
Recon 2 (Secondary)					
DFOV	**16**	**16**	**16**	**16**	**16**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**2500/350**	**2500/350**	**2500/350**	**2500/350**	**2500/350**
Recon Option	**Plus**	**Plus**	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**	**None**	**None**	**None**	**None**
Slice Thickness (mm)	**0.625**	**0.625**	**0.625**	**0.625**	**0.625**
Interval (mm)	**0.312**	**0.312**	**0.312**	**0.312**	**0.312**
Recon 3 (Secondary)					
DFOV	**16**	**16**	**16**	**16**	**16**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**2500/350**	**2500/350**	**2500/350**	**2500/350**	**2500/350**
Recon Option	**Plus**	**Plus**	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**	**None**	**None**	**None**	**None**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**	**0.625**	**0.625**

If metal is present, also provide the physician with these recons. (note, not all GE scanners have MARS, and MARS only works at helical pitches below 1)

	All Sizes
Recon 4 (Secondary)	
DFOV	**16**
Recon Type	**Soft**
WW/WL	**450/50**
Recon Option	**Plus**
Recon Option	**IQ Enhance**
Recon Option	**MARS On**
ASiR/ASiR256/DLIR	**60% / 30% / High**
Slice Thickness (mm)	**1.25**
Interval (mm)	**0.625**

16 & 32 Slice Scanner Exceptions:

1. The 0.625mm slice thickness x 0.312mm interval Recon should be 1.25mm slice thickness x 0.625mm interval on 16 and 32 slice CT scanners. The 16 and 32 slice scanners are only able to recon down to 0.625mm slice thickness when using 10mm and/or 20mm beam collimation respectively. However, when using 20mm and/or 40mm beam collimation, they are only capable of reconstructing to 1.25mm slice thickness.
2. MARS feature is not an option.
3. IQ Enhance feature requires thin slices (1.25mm or less) with an interval of half (or less). On older scanner models, in order to enable IQ Enhance at 0.625 mm slice thickness, the interval must be set to 0.311 mm instead of 0.312 mm.

DLIR Limitations:

1. DLIR is not available on the Primary Recon.
2. DLIR is only compatible with the Standard Algorithm. So, in instances where the primary recon is Soft algorithm,(i.e. many Neuro Protocols) the subsequent recons will be in Standard Algorithm to enable DLIR. The slight difference between the Soft and Standard Algorithms is outweighed by the improvement in image quality with DLIR enabled.
3. DLIR requires an interval exactly half of the slice thickness.
4. DLIR doesn't allow an interval of 0.312 mm. So, if you are on a DLIR enabled scanner, the thin 0.625 recon will be at 0.625x0.625 mm. On all other scanners the thin recon will be at 0.625x0.312 mm.

Pediatric Thoracic Spine 17.1.2/17.2.2/17.4.2/17.6.2/17.8.2

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Indication

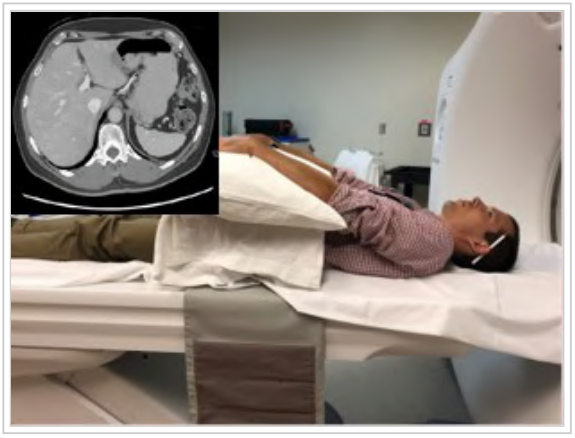
Trauma, thoracic pain, thoracic stenosis, radiculopathy, fracture, evaluate fixation hardware

Oral Contrast

None

Pre-Scan Instructions

- Extend the scouts to include the aortic arch for smart prep if IV contrast is to be used.
- Remove all metallic and high-density objects from the scanning area including the patients arms. If the patient is unable to raise their arms above their head, please use the "pillow trick":



- Post myelography patients: Please remember to roll the patient 360 degrees before scanning to distribute the contrast evenly in the spinal canal.
- **Only if both CT T and L spines are ordered**
  - Please start scanning T and L spines together (scanning acquisition parameters are identical so we will be saving the patients some radiation dose due to avoiding any overlap).
  - Do separate coronal and sagittal reformats and send to PACS as 2 different exams using exam split.
  - Axial images of the entire Spine (T and L) should be sent to both T and L Spine exams. Sagittal and coronal reformats for the T-Spine should go from C7 to L1, and the sag and cor reformats from the L-Spine go from T12 to S2.
  - Also include the entire T/L Spine sagittal reformat. Do not include a coronal reformat of the entire T/L Spine.

IV Contrast Parameters 350

Weight Ranges	Contrast Dosage	Injection Rate
0-62 kgs (0-137 lbs)	1.3 mL/kg (0.6 mL/lbs) Iohexol 350 mgI/mL	2 mL/sec
> 63 kgs (137 lbs)	Weight based Medrad P3T or UW ConCal Routine Peds protocol	2 mL/sec

IV Contrast Parameters 300/370

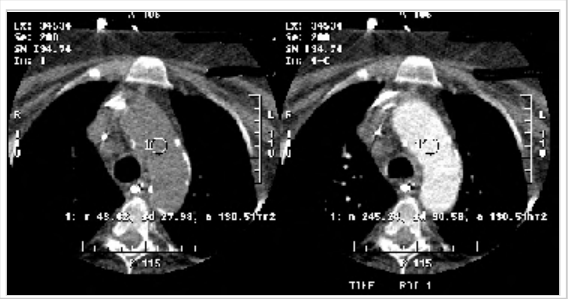
Weight Ranges	Contrast Dosage	Injection Rate
0-80 kgs (0-175 lbs)	1.5 mL/kg (0.7 mL/lbs) Iohexol 300 mgI/mL	2 mL/sec

Field of View

Preferred 16cm

Scan Description

- Series 1 – Scouts PA and Lateral
- Series 2 – CT T-Spine without: Scan from the top of C7 to the bottom of L1
- Series 3 - CT T-Spine with: Scan from the top of C7 to the bottom of L1
  - Smart Prep: Place ROI on the aortic arch.
    - CT scan delay after arrival of contrast in aortic arch:
    - 8 sec (16 slice scanners), 10 sec (64 slice scanners) These diagnostic delays are built into the protocol.



Reformat Instructions

- Do not send the 0.625 mm bone images (Recon 2) to PACS
- Do 2 x 1 mm coronal and sagittal 2D-reformats.
- If exam is solely with contrast or solely without contrast: Do 2D-reformats using both the standard 1.25 mm images (Recon 1) AND the bone 0.625 mm images (Recon 2)
- If this is a “with & without” contrast study: Do not do Recons 2 and 3 on the non-contrast part
- If this is a “with & without” contrast study: Do 2D-reformats only from the contrast portion of the study using standard 1.25 mm images (Recon 1) AND bone 0.625 mm images (Recon 2)

Reformats

With or Without Contrast

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
CO ST	Thin ST	Manual	Average	450/50	2	1	Coronal
CO BONE	Thin Bone	Manual	Average	2500/350	2	1	Coronal
SA ST	Thin ST	Manual	Average	450/50	2	1	Sagittal
SA BONE	Thin Bone	Manual	Average	2500/350	2	1	Sagittal

With and Without Contrast

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
CO ST	THIN ST (with contrast phase)	Manual	Average	450/50	2	1	Coronal
CO BONE	THIN BONE (with contrast phase)	Manual	Average	2500/350	2	1	Coronal
SA ST	THIN ST (with contrast phase)	Manual	Average	450/50	2	1	Sagittal
SA BONE	THIN BONE (with contrast phase)	Manual	Average	2500/350	2	1	Sagittal

Networking

- All Images to PACS (ALI_Store). Do not send Thin Bone, these recons are made solely to build reformats from.
- If Metal is present, send THIN ST MAR and build reformats from that series.
- Note: if smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

Miscellaneous

None

Acquisition Parameters

Series 1, Scout

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-55 cm
Scout 1 kV	80	80	80	80	100
Scout 1 mA	10	10	10	10	10
Scout 1 Angle	180	180	180	180	180
Scout 2 kV	80	80	80	80	100
Scout 2 mA	40	40	40	40	40
Scout 2 Angle	90	90	90	90	90
WW/WL for Scout	500/50	500/50	500/50	500/50	500/50

Series 2, Scan Phase

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-55 cm
Scan Type	Helical	Helical	Helical	Helical	Helical
Beam Collimation	20	20	20	40	40
Detector Rows	32.0	32.0	32.0	64.0	64.0
Detector Configuration	32x0.625	32x0.625	32x0.625	64x0.625	64x0.625
Scan FOV	Small Body	Small Body	Small Body	Large Body	Large Body
Pitch	0.516	0.516	0.516	0.516	0.516
Speed (mm/rot)	10.30	10.30	10.30	20.60	20.60
Rotation Time (s)	0.5	0.5	0.5	0.6	0.8
kV	80	80	80	80	100
AEC type	smart mA	smart mA	smart mA	smart mA	smart mA
mA Range	(10-60)	(15-80)	(20-130)	(35-230)	(35-210)
Manual mA	40.0	50.0	80.0	140.0	140.0
Noise Index	14.5	16.5	18.5	21.5	20.5
Slice Thickness (mm)	1.25	1.25	1.25	1.25	1.25
Interval (mm)	0.625	0.625	0.625	0.625	0.625

Series 2, Recons

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-55 cm
Recon 1 (Primary)					
DFOV	**16**	**16**	**16**	**16**	**16**
Recon Type	**Soft**	**Soft**	**Soft**	**Soft**	**Soft**
WW/WL	**450/50**	**450/50**	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**60% / 30% / High**	**60% / 30% / High**	**60% / 30% / High**	**60% / 30% / High**	**60% / 30% / High**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**	**0.625**	**0.625**
Recon 2 (Secondary)					
DFOV	**16**	**16**	**16**	**16**	**16**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**2500/350**	**2500/350**	**2500/350**	**2500/350**	**2500/350**
Recon Option	**Plus**	**Plus**	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**	**None**	**None**	**None**	**None**
Slice Thickness (mm)	**0.625**	**0.625**	**0.625**	**0.625**	**0.625**
Interval (mm)	**0.312**	**0.312**	**0.312**	**0.312**	**0.312**
Recon 3 (Secondary)					
DFOV	**16**	**16**	**16**	**16**	**16**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**2500/350**	**2500/350**	**2500/350**	**2500/350**	**2500/350**
Recon Option	**Plus**	**Plus**	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**	**None**	**None**	**None**	**None**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**	**0.625**	**0.625**

If metal is present, also provide the physician with these recons. (note, not all GE scanners have MARS, and MARS only works at helical pitches below 1)

	All Sizes
Recon 4 (Secondary)	
DFOV	**16**
Recon Type	**Soft**
WW/WL	**450/50**
Recon Option	**Plus**
Recon Option	**IQ Enhance**
Recon Option	**MARS On**
ASiR/ASiR256/DLIR	**60% / 30% / High**
Slice Thickness (mm)	**1.25**
Interval (mm)	**0.625**

16 & 32 Slice Scanner Exceptions:

1. The 0.625mm slice thickness x 0.312mm interval Recon should be 1.25mm slice thickness x 0.625mm interval on 16 and 32 slice CT scanners. The 16 and 32 slice scanners are only able to recon down to 0.625mm slice thickness when using 10mm and/or 20mm beam collimation respectively. However, when using 20mm and/or 40mm beam collimation, they are only capable of reconstructing to 1.25mm slice thickness.
2. MARS feature is not an option.
3. IQ Enhance feature requires thin slices (1.25mm or less) with an interval of half (or less). On older scanner models, in order to enable IQ Enhance at 0.625 mm slice thickness, the interval must be set to 0.311 mm instead of 0.312 mm.

DLIR Limitations:

1. DLIR is not available on the Primary Recon.
2. DLIR is only compatible with the Standard Algorithm. So, in instances where the primary recon is Soft algorithm,(i.e. many Neuro Protocols) the subsequent recons will be in Standard Algorithm to enable DLIR. The slight difference between the Soft and Standard Algorithms is outweighed by the improvement in image quality with DLIR enabled.
3. DLIR requires an interval exactly half of the slice thickness.
4. DLIR doesn't allow an interval of 0.312 mm. So, if you are on a DLIR enabled scanner, the thin 0.625 recon will be at 0.625x0.625 mm. On all other scanners the thin recon will be at 0.625x0.312 mm.

Series 3, Smart Prep

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-55 cm
mA	**10**	**10**	**10**	**10**	**10**
Monitoring Delay (sec)	**20**	**20**	**20**	**20**	**20**
Monitoring ISD (sec)	**2.0**	**2.0**	**2.0**	**2.0**	**2.0**
Enhancement Threshold (HU)	**50**	**50**	**50**	**50**	**50**
Diagnostic Delay	**10**	**10**	**10**	**10**	**10**

Series 3, Scan Phase

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-55 cm
Scan Type	**Helical**	**Helical**	**Helical**	**Helical**	**Helical**
Beam Collimation	**20**	**20**	**20**	**40**	**40**
Detector Rows	**32.0**	**32.0**	**32.0**	**64.0**	**64.0**
Detector Configuration	**32x0.625**	**32x0.625**	**32x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Small Body**	**Small Body**	**Small Body**	**Large Body**	**Large Body**
Pitch	**0.516**	**0.516**	**0.516**	**0.516**	**0.516**
Speed (mm/rot)	**10.30**	**10.30**	**10.30**	**20.60**	**20.60**
Rotation Time (s)	**0.5**	**0.5**	**0.5**	**0.6**	**0.8**
kV	**80**	**80**	**80**	**80**	**100**
AEC type	**smart mA**	**smart mA**	**smart mA**	**smart mA**	**smart mA**
mA Range	**(10-60)**	**(15-80)**	**(20-130)**	**(35-230)**	**(35-210)**
Manual mA	**40.0**	**50.0**	**80.0**	**140.0**	**140.0**
Noise Index	**14.5**	**16.5**	**18.5**	**21.5**	**20.5**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**	**0.625**	**0.625**

Series 3, Recons

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-55 cm
Recon 1 (Primary)					
DFOV	**16**	**16**	**16**	**16**	**16**
Recon Type	**Soft**	**Soft**	**Soft**	**Soft**	**Soft**
WW/WL	**450/50**	**450/50**	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**60% / 30% / High**	**60% / 30% / High**	**60% / 30% / High**	**60% / 30% / High**	**60% / 30% / High**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**	**0.625**	**0.625**
Recon 2 (Secondary)					
DFOV	**16**	**16**	**16**	**16**	**16**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**2500/350**	**2500/350**	**2500/350**	**2500/350**	**2500/350**
Recon Option	**Plus**	**Plus**	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**	**None**	**None**	**None**	**None**
Slice Thickness (mm)	**0.625**	**0.625**	**0.625**	**0.625**	**0.625**
Interval (mm)	**0.312**	**0.312**	**0.312**	**0.312**	**0.312**
Recon 3 (Secondary)					
DFOV	**16**	**16**	**16**	**16**	**16**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**2500/350**	**2500/350**	**2500/350**	**2500/350**	**2500/350**
Recon Option	**Plus**	**Plus**	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**	**None**	**None**	**None**	**None**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**	**0.625**	**0.625**

If metal is present, also provide the physician with these recons. (note, not all GE scanners have MARS, and MARS only works at helical pitches below 1)

	All Sizes
Recon 4 (Secondary)	
DFOV	**16**
Recon Type	**Soft**
WW/WL	**450/50**
Recon Option	**Plus**
Recon Option	**IQ Enhance**
Recon Option	**MARS On**
ASiR/ASiR256/DLIR	**60% / 30% / High**
Slice Thickness (mm)	**1.25**
Interval (mm)	**0.625**

16 & 32 Slice Scanner Exceptions:

1. The 0.625mm slice thickness x 0.312mm interval Recon should be 1.25mm slice thickness x 0.625mm interval on 16 and 32 slice CT scanners. The 16 and 32 slice scanners are only able to recon down to 0.625mm slice thickness when using 10mm and/or 20mm beam collimation respectively. However, when using 20mm and/or 40mm beam collimation, they are only capable of reconstructing to 1.25mm slice thickness.
2. MARS feature is not an option.
3. IQ Enhance feature requires thin slices (1.25mm or less) with an interval of half (or less). On older scanner models, in order to enable IQ Enhance at 0.625 mm slice thickness, the interval must be set to 0.311 mm instead of 0.312 mm.

DLIR Limitations:

1. DLIR is not available on the Primary Recon.
2. DLIR is only compatible with the Standard Algorithm. So, in instances where the primary recon is Soft algorithm,(i.e. many Neuro Protocols) the subsequent recons will be in Standard Algorithm to enable DLIR. The slight difference between the Soft and Standard Algorithms is outweighed by the improvement in image quality with DLIR enabled.
3. DLIR requires an interval exactly half of the slice thickness.
4. DLIR doesn't allow an interval of 0.312 mm. So, if you are on a DLIR enabled scanner, the thin 0.625 recon will be at 0.625x0.625 mm. On all other scanners the thin recon will be at 0.625x0.312 mm.

Peds Bony Pelvis (without Metal) 18.1.1/18.2.1/18.4.1/18.6.1/18.8.1

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Indication

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. 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.

If the pediatric patient is obese with an AP + LAT size over 55 cm, please use the appropriate adult protocol (probably the Adult Small Bony Pelvis Without Metal).

Oral Contrast

None

Pre-Scan Instructions

- Patient supine, legs flat on the table.
- No cushions/wedges under legs/feet.
- Turn the toes inward.

IV Contrast Parameters 350

Weight Ranges	Contrast Dosage	Injection Rate
<34 kg (<75 lbs)	1.7 mL/kg Iohexol 350 mgI/mL + 30 mL NaCl flush	1.5 - 3 mL/sec
35-58 kg (75-129 lbs)	69 mL Iohexol 350 mgI/mL + 30 mL NaCl flush	1.5 - 3 mL/sec
>59 kg (>130 lbs)	Patients above 46 kg use the "Use Medrad P3T or UW-ConCal Routine Peds Calculator Protocol" with Iohexol 350mgI/mL + 30mL NaCl flush.	1.5 - 3 mL/sec
Injection Rate variable, depending on the size of patient and IV guage.		

For sites without the Ulrich use Medrad p3T or refer to the weight based contrast tables included with the protocol booklet.

IV Contrast Parameters 300/370

Weight Ranges	Contrast Dosage	Injection Rate
<40 kg (<100 lbs)	2 mL/kg Iohexol 300 mgI/mL + 30 mL NaCl flush	1.5 - 3 mL/sec
45-65 kg (100-140 lbs)	80 mL Iohexol 300 mgI/mL + 30 mL NaCl flush	1.5 - 3 mL/sec
>65 kg (>140 lbs)	Patients above 65 kg use the Medrad™ P3T for volume of Iohexol 300mgI/mL + 30mL NaCl flush.	1.5 - 3 mL/sec
Injection Rate variable, depending on the size of patient and IV guage.		

For sites without the Medrad™ P3T or P3T PA option, refer to the weight based contrast tables we provide in the protocol booklet.

Field of View

Same as previous study or as small as appropriate

Scan Description

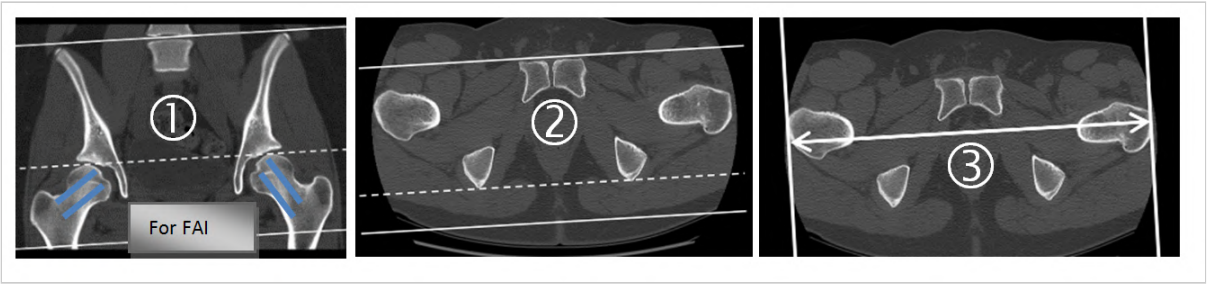
- Series 1 – PA and lateral scout
- Series 2 – CT Bony Pelvis
  - Coverage: (see picture)
  - From above iliac crests (white line)
  - To below lesser trochanters and below ischial tuberosities (gray line)

Peds Bony Pelvis Scan Range

Reformat Instructions

Reformat slices 3mm Thick at 1.5mm Intervals in all 3 planes in the Bone Window unless specified to also do STD.

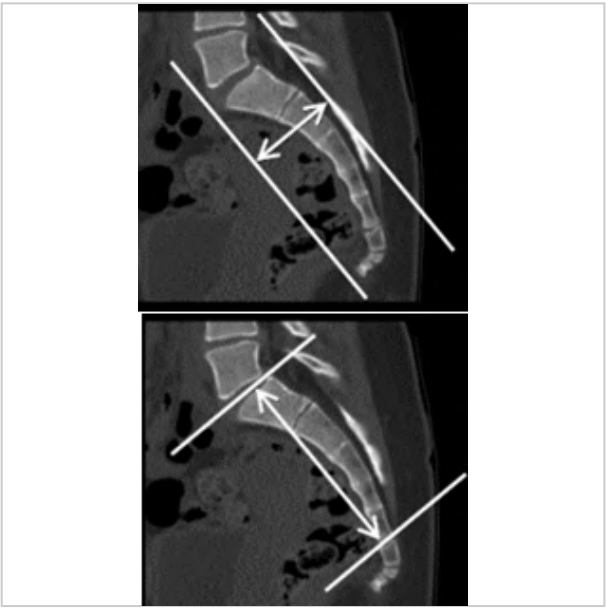
- Straight Axial Reformats
  - Set-up off a coronal image that shows both femoral heads.
  - Angle such that slices cut through femoral heads evenly (dotted line).
  - Cover from iliac crests through ischial tuberosities and lesser trochanters.
- Straight Coronal Reformats
  - Set-up off an axial image that shows pubic symphysis.
  - Angle slices through ischial tuberosities evenly (dotted line).
  - Cover from in front of the pubic symphysis to behind the gluteal muscles.
- Straight Sagittal Reformats
  - Can set-up off same axial image as above.
  - Cover continuously from the right hip to the left hip, including the sacrum.



Reformat slices 3mm Thick at 1.5mm Intervals in all 3 planes
For "FAI" add oblique reformats parallel to femoral necks (blue lines)

SI Joints- Reformat 3mm Thick at 1.5mm Intervals

- Oblique Coronal Reformats
  - Set-up off a mid-line sagittal image through the sacrum.
  - Angle slices parallel to the long axis of the sacrum.
  - Cover the sacrum front-to-back. (Check the reformats to make sure the SI joints are covered in their entirety.)
- Oblique Axial Reformats
  - Set-up off same mid-sagittal image as above.
  - Angle slices to be perpendicular to the oblique coronals.
  - Cover the entire sacrum top-to-bottom.



SI joints for reformatting

Reformats

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
AX	Thin Bone	Manual	Average	2500/350	3	1.5	axial
CO	Thin Bone	Manual	Average	2500/350	3	1.5	coronal
SA	Thin Bone	Manual	Average	2500/350	3	1.5	sagittal

Networking

- All images are networked to PACS (ALI_Store).
- Note: If smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

Miscellaneous

None.

Acquisition Parameters

Series 1, Scout

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-60 cm
Scout 1 kV	**80**	**80**	**80**	**80**	**100**
Scout 1 mA	**10**	**10**	**10**	**10**	**10**
Scout 1 Angle	**180**	**180**	**180**	**180**	**180**
Scout 2 kV	**80**	**80**	**80**	**80**	**100**
Scout 2 mA	**40**	**40**	**40**	**40**	**40**
Scout 2 Angle	**90**	**90**	**90**	**90**	**90**
WW/WL for Scout	**500/50**	**500/50**	**500/50**	**500/50**	**500/50**

Series 2, Scan Phase

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-60 cm
Scan Type	**Helical**	**Helical**	**Helical**	**Helical**	**Helical**
Beam Collimation	**20**	**20**	**20**	**40**	**40**
Detector Rows	**32.0**	**32.0**	**32.0**	**64.0**	**64.0**
Detector Configuration	**32x0.625**	**32x0.625**	**32x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Small Body**	**Small Body**	**Small Body**	**Large Body**	**Large Body**
Pitch	**1.375**	**1.375**	**1.375**	**1.375**	**1.375**
Speed (mm/rot)	**27.50**	**27.50**	**27.50**	**55.00**	**55.00**
Rotation Time (s)	**0.5**	**0.5**	**0.5**	**1**	**1**
kV	**80**	**80**	**80**	**80**	**100**
AEC type	**smart mA**	**smart mA**	**smart mA**	**smart mA**	**smart mA**
mA Range	**(30-180)**	**(35-220)**	**(60-350)**	**(60-370)**	**(70-470)**
Manual mA	**110.0**	**140.0**	**220.0**	**230.0**	**300.0**
Noise Index	**8.5**	**9.5**	**10.5**	**12.0**	**11.5**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.25**	**2.25**	**2.25**	**2.25**	**2.25**

Series 2, Recons

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-60 cm
Recon 1 (Primary)					
DFOV	**20**	**20**	**20**	**25**	**25**
Recon Type	**Detail**	**Detail**	**Detail**	**Detail**	**Detail**
WW/WL	**450/50**	**450/50**	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**	**Plus**	**Plus**
Recon Option					
ASiR/ASiR256/DLIR	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.25**	**2.25**	**2.25**	**2.25**	**2.25**
Recon 2 (Secondary)					
DFOV	**16**	**16**	**16**	**16**	**16**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**2500/350**	**2500/350**	**2500/350**	**2500/350**	**2500/350**
Recon Option	**Plus**	**Plus**	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**	**None**	**None**	**None**	**None**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**	**0.625**	**0.625**
Recon 3 (Secondary)					
DFOV	**20**	**20**	**20**	**25**	**25**
Recon Type	**Detail**	**Detail**	**Detail**	**Detail**	**Detail**
WW/WL	**450/50**	**450/50**	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**	**0.625**	**0.625**

16 & 32 Slice Scanner Exceptions:

1. The 0.625mm slice thickness x 0.312mm interval Recon should be 1.25mm slice thickness x 0.625mm interval on 16 and 32 slice CT scanners. The 16 and 32 slice scanners are only able to recon down to 0.625mm slice thickness when using 10mm and/or 20mm beam collimation respectively. However, when using 20mm and/or 40mm beam collimation, they are only capable of reconstructing to 1.25mm slice thickness.
2. MARS feature is not an option.
3. IQ Enhance feature requires thin slices (1.25mm or less) with an interval of half (or less). On older scanner models, in order to enable IQ Enhance at 0.625 mm slice thickness, the interval must be set to 0.311 mm instead of 0.312 mm.

DLIR Limitations:

1. DLIR is not available on the Primary Recon.
2. DLIR is only compatible with the Standard Algorithm. So, in instances where the primary recon is Soft algorithm,(i.e. many Neuro Protocols) the subsequent recons will be in Standard Algorithm to enable DLIR. The slight difference between the Soft and Standard Algorithms is outweighed by the improvement in image quality with DLIR enabled.
3. DLIR requires an interval exactly half of the slice thickness.

4. DLIR doesn't allow an interval of 0.312 mm. So, if you are on a DLIR enabled scanner, the thin 0.625 recon will be at 0.625x0.625 mm. On all other scanners the thin recon will be at 0.625x0.312 mm.

Peds Bony Pelvis (with Metal) 18.1.2/18.2.2/18.4.2/18.6.2/18.8.2

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Indication

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). Note: there are separate adult and pediatric protocols for bony pelvis and there is a separate adult femoral anteversion and pediatric SPICA protocol.

Oral Contrast

None

Pre-Scan Instructions

- Patient supine, legs flat on the table.
- No cushions/wedges under legs/feet.
- Turn the toes inward.

IV Contrast Parameters 350

Weight Ranges	Contrast Dosage	Injection Rate
<34 kg (<75 lbs)	1.7 mL/kg Iohexol 350 mgI/mL + 30 mL NaCl flush	1.5 - 3 mL/sec
35-58 kg (75-129 lbs)	69 mL Iohexol 350 mgI/mL + 30 mL NaCl flush	1.5 - 3 mL/sec
>59 kg (>130 lbs)	Patients above 46 kg use the "Use Medrad P3T or UW-ConCal Routine Peds Calculator Protocol" with Iohexol 350mgI/mL + 30mL NaCl flush.	1.5 - 3 mL/sec
Injection Rate variable, depending on the size of patient and IV guage.		

For sites without the Ulrich use Medrad p3T or refer to the weight based contrast tables included with the protocol booklet.

IV Contrast Parameters 300/370

Weight Ranges	Contrast Dosage	Injection Rate
<40 kg (<100 lbs)	2 mL/kg Iohexol 300 mgI/mL + 30 mL NaCl flush	1.5 - 3 mL/sec
45-65 kg (100-140 lbs)	80 mL Iohexol 300 mgI/mL + 30 mL NaCl flush	1.5 - 3 mL/sec
>65 kg (>140 lbs)	Patients above 65 kg use the Medrad™ P3T for volume of Iohexol 300mgI/mL + 30mL NaCl flush.	1.5 - 3 mL/sec
Injection Rate variable, depending on the size of patient and IV guage.		

For sites without the Medrad™ P3T or P3T PA option, refer to the weight based contrast tables we provide in the protocol booklet.

Field of View

Same as previous study or as small as appropriate

Scan Description

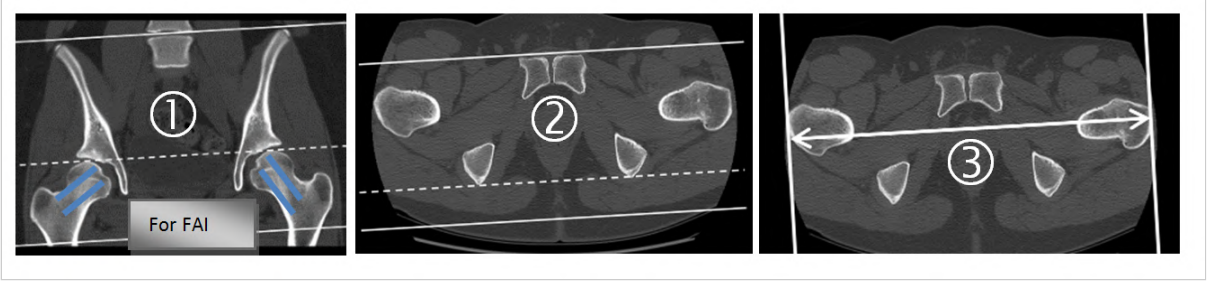
- Series 1 – PA and lateral scout
- Series 2 – CT Bony Pelvis
  - Coverage: (see picture)
  - From above iliac crests
  - To below lesser trochanters and below ischial tuberosities
  - If hardware is present, cover the hardware and adjacent bone

Peds Bony Pelvis with metal Scan Range

Reformat Instructions

Reformat slices 3mm Thick at 1.5mm Intervals in all 3 planes in the Bone Window unless specified to also do STD.

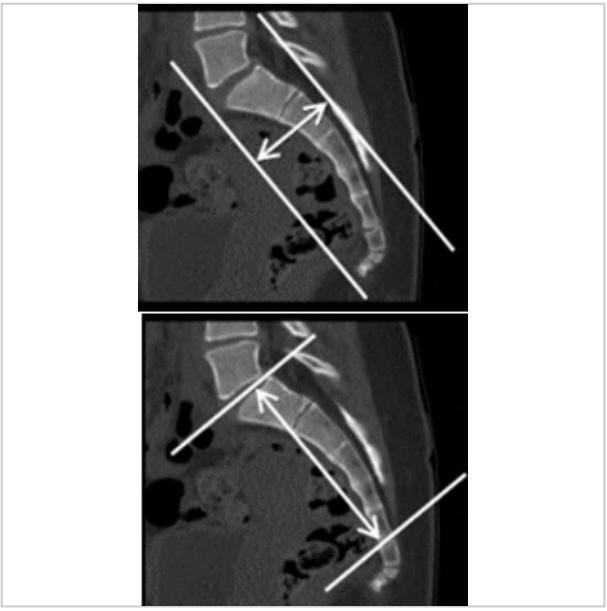
- Straight Axial Reformats
  - Set-up off a coronal image that shows both femoral heads.
  - Angle such that slices cut through femoral heads evenly (dotted line).
  - Cover from iliac crests through ischial tuberosities and lesser trochanters.
- Straight Coronal Reformats
  - Set-up off an axial image that shows pubic symphysis.
  - Angle slices through ischial tuberosities evenly (dotted line).
  - Cover from in front of the pubic symphysis to behind the gluteal muscles.
- Straight Sagittal Reformats
  - Can set-up off same axial image as above.
  - Cover continuously from the right hip to the left hip, including the sacrum.



Reformat slices 3mm Thick at 1.5mm Intervals in all 3 planes
For "FAI" add oblique reformats parallel to femoral necks (blue lines)

SI Joints- Reformat 3mm Thick at 1.5mm Intervals

- Oblique Coronal Reformats
  - Set-up off a mid-line sagittal image through the sacrum.
  - Angle slices parallel to the long axis of the sacrum.
  - Cover the sacrum front-to-back. (Check the reformats to make sure the SI joints are covered in their entirety.)
- Oblique Axial Reformats
  - Set-up off same mid-sagittal image as above.
  - Angle slices to be perpendicular to the oblique coronals.
  - Cover the entire sacrum top-to-bottom.



SI joints for reformatting

Reformats

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
AX	Thin Bone	Manual	Average	2500/350	3	1.5	axial
CO	Thin Bone	Manual	Average	2500/350	3	1.5	coronal
SA	Thin Bone	Manual	Average	2500/350	3	1.5	sagittal

Networking

- All images are networked to PACS (ALI_Store).
- Note: If smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

Miscellaneous

None.

Acquisition Parameters

Series 1, Scout

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-60 cm
Scout 1 kV	**80**	**80**	**80**	**80**	**100**
Scout 1 mA	**10**	**10**	**10**	**10**	**10**
Scout 1 Angle	**180**	**180**	**180**	**180**	**180**
Scout 2 kV	**80**	**80**	**80**	**80**	**100**
Scout 2 mA	**40**	**40**	**40**	**40**	**40**
Scout 2 Angle	**90**	**90**	**90**	**90**	**90**
WW/WL for Scout	**500/50**	**500/50**	**500/50**	**500/50**	**500/50**

Series 2, Scan Phase

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-60 cm
Scan Type	**Helical**	**Helical**	**Helical**	**Helical**	**Helical**
Beam Collimation	**40**	**40**	**40**	**40**	**40**
Detector Rows	**64.0**	**64.0**	**64.0**	**64.0**	**64.0**
Detector Configuration	**64x0.625**	**64x0.625**	**64x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Large Body**	**Large Body**	**Large Body**	**Large Body**	**Large Body**
Pitch	**0.516**	**0.516**	**0.516**	**0.516**	**0.516**
Speed (mm/rot)	**20.60**	**20.60**	**20.60**	**20.60**	**20.60**
Rotation Time (s)	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**
kV	**140**	**140**	**140**	**140**	**140**
AEC type	**smart mA**	**smart mA**	**smart mA**	**smart mA**	**smart mA**
mA Range	**(50-440)**	**(50-440)**	**(50-440)**	**(50-440)**	**(50-440)**
Manual mA	**270.0**	**270.0**	**270.0**	**270.0**	**270.0**
Noise Index	**11.5**	**11.5**	**11.5**	**11.5**	**11.5**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**	**0.625**	**0.625**

Series 2, Recons

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-60 cm
Recon 1 (Primary)					
DFOV	**20**	**20**	**20**	**25**	**25**
Recon Type	**Detail**	**Detail**	**Detail**	**Detail**	**Detail**
WW/WL	**450/50**	**450/50**	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**	**0.625**	**0.625**
Recon 2 (Secondary)					
DFOV	**16**	**16**	**16**	**16**	**16**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**2500/350**	**2500/350**	**2500/350**	**2500/350**	**2500/350**
Recon Option	**Plus**	**Plus**	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**	**None**	**None**	**None**	**None**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**	**0.625**	**0.625**

16 & 32 Slice Scanner Exceptions:

1. The 0.625mm slice thickness x 0.312mm interval Recon should be 1.25mm slice thickness x 0.625mm interval on 16 and 32 slice CT scanners. The 16 and 32 slice scanners are only able to recon down to 0.625mm slice thickness when using 10mm and/or 20mm beam collimation respectively. However, when using 20mm and/or 40mm beam collimation, they are only capable of reconstructing to 1.25mm slice thickness.
2. MARS feature is not an option.
3. IQ Enhance feature requires thin slices (1.25mm or less) with an interval of half (or less). On older scanner models, in order to enable IQ Enhance at 0.625 mm slice thickness, the interval must be set to 0.311 mm instead of 0.312 mm.

DLIR Limitations:

1. DLIR is not available on the Primary Recon.
2. DLIR is only compatible with the Standard Algorithm. So, in instances where the primary recon is Soft algorithm,(i.e. many Neuro Protocols) the subsequent recons will be in Standard Algorithm to enable DLIR. The slight difference between the Soft and Standard Algorithms is outweighed by the improvement in image quality with DLIR enabled.
3. DLIR requires an interval exactly half of the slice thickness.
4. DLIR doesn't allow an interval of 0.312 mm. So, if you are on a DLIR enabled scanner, the thin 0.625 recon will be at 0.625x0.625 mm. On all other scanners the thin recon will be at 0.625x0.312 mm.

Peds Bony Pelvis Low-Dose Spica Casting 18.1.3/18.2.3/18.4.3/18.6.3/18.8.3

Additional resources for this protocol are available here https://uwgect.wiscweb.wisc.edu/resources/

Clinical Instructions

Indication

Developmental dysplasia of the hips, typically on a kid < 1 year old. This low-dose protocol should be use pre-SPICA casting.

Oral Contrast

None

Pre-Scan Instructions

- Patient supine, legs flat on the table.
- No cushions/wedges under legs/feet.
- Turn the toes inward.

IV Contrast Parameters

None

Field of View

Same as previous study or as small as appropriate

Scan Description

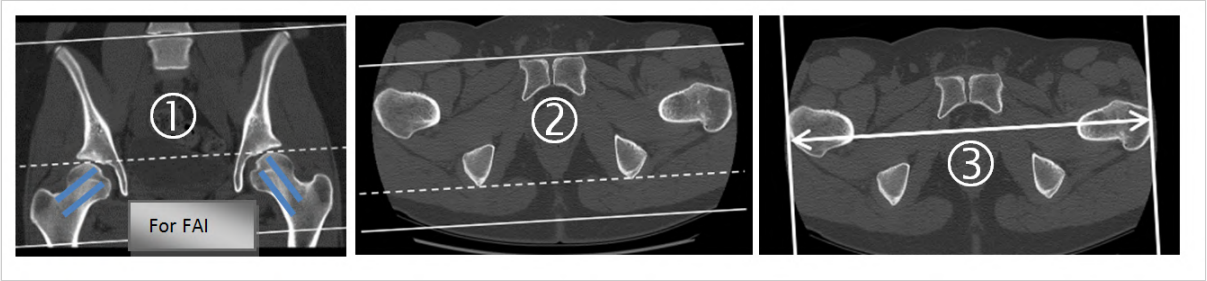
- Series 1 – PA and lateral scout
- Series 2 – CT Bony Pelvis
    - Coverage: (see picture)
    - From above iliac crests (white line)
    - To below lesser trochanters and below ischial tuberosities (gray line)

Peds Bony Pelvis Scan Range

Reformat Instructions

Reformat slices 3mm Thick at 1.5mm Intervals in all 3 planes in the Bone Window unless specified to also do STD.

- Straight Axial Reformats
  - Set-up off a coronal image that shows both femoral heads.
  - Angle such that slices cut through femoral heads evenly (dotted line).
  - Cover from iliac crests through ischial tuberosities and lesser trochanters.
- Straight Coronal Reformats
  - Set-up off an axial image that shows pubic symphysis.
  - Angle slices through ischial tuberosities evenly (dotted line).
  - Cover from in front of the pubic symphysis to behind the gluteal muscles.
- Straight Sagittal Reformats
  - Can set-up off same axial image as above.
  - Cover continuously from the right hip to the left hip, including the sacrum.

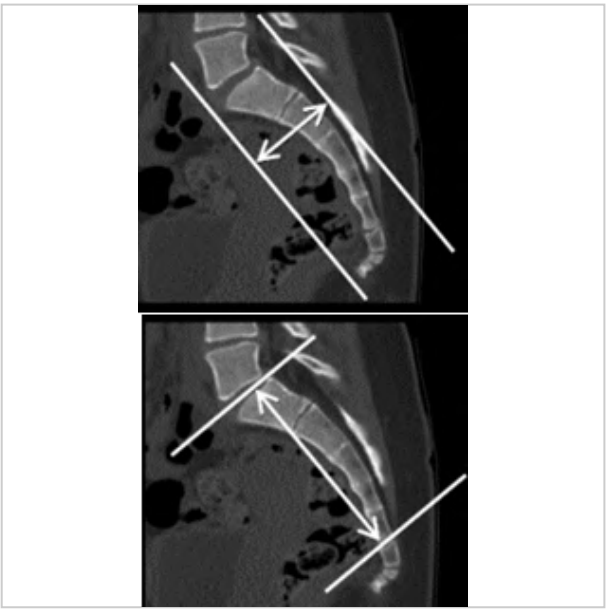


Reformat slices 3mm Thick at 1.5mm Intervals in all 3 planes
For "FAI" add oblique reformats parallel to femoral necks (blue lines)

SI Joints- Reformat 3mm Thick at 1.5mm Intervals

- Oblique Coronal Reformats
  - Set-up off a mid-line sagittal image through the sacrum.
  - Angle slices parallel to the long axis of the sacrum.
  - Cover the sacrum front-to-back. (Check the reformats to make sure the SI joints are covered in their entirety.)
- Oblique Axial Reformats
  - Set-up off same mid-sagittal image as above.
  - Angle slices to be perpendicular to the oblique coronals.

- Cover the entire sacrum top-to-bottom.



SI joints for reformatting

Reformats

Name	Source Series Name	DMPR or Manual	Type (MIP, Average, etc.)	WW/WL	Slice Thickness (mm)	Interval (mm)	Orientation
AX	Thin Bone	Manual	Average	2500/350	3	1.5	axial
CO	Thin Bone	Manual	Average	2500/350	3	1.5	coronal
SA	Thin Bone	Manual	Average	2500/350	3	1.5	sagittal

Networking

- All images are networked to PACS (ALI_Store).
- Note: If smartprep is used, please also send the screen save (Series 99) of the smartprep locations and enhancement curve.

Miscellaneous

None.

Acquisition Parameters

Series 1, Scout

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-60 cm
Scout 1 kV	80	80	80	80	100
Scout 1 mA	10	10	10	10	10
Scout 1 Angle	180	180	180	180	180
Scout 2 kV	80	80	80	80	100
Scout 2 mA	40	40	40	40	40
Scout 2 Angle	90	90	90	90	90
WW/WL for Scout	500/50	500/50	500/50	500/50	500/50

Series 2, Scan Phase

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-60 cm
Scan Type	**Helical**	**Helical**	**Helical**	**Helical**	**Helical**
Beam Collimation	**20**	**20**	**20**	**40**	**40**
Detector Rows	**32.0**	**32.0**	**32.0**	**64.0**	**64.0**
Detector Configuration	**32x0.625**	**32x0.625**	**32x0.625**	**64x0.625**	**64x0.625**
Scan FOV	**Small Body**	**Small Body**	**Small Body**	**Large Body**	**Large Body**
Pitch	**1.375**	**1.375**	**1.375**	**1.375**	**1.375**
Speed (mm/rot)	**27.50**	**27.50**	**27.50**	**55.00**	**55.00**
Rotation Time (s)	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**
kV	**80**	**80**	**80**	**80**	**100**
AEC type	**smart mA**	**smart mA**	**smart mA**	**smart mA**	**smart mA**
mA Range	**(10-50)**	**(10-70)**	**(15-100)**	**(35-220)**	**(45-270)**
Manual mA	**30.0**	**40.0**	**70.0**	**140.0**	**170.0**
Noise Index	**15.5**	**17.5**	**19.5**	**22.5**	**21.5**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.25**	**2.25**	**2.25**	**2.25**	**2.25**

Series 2, Recons

	Pink/Newborn/0-26 cm	Red Purple/6 mo.-2.5 years/27-31 cm	Yellow White/3-7 years/32-37 cm	Blue Orange/8-12 years/38-43 cm	Green Black/13-18 years/44-60 cm
Recon 1 (Primary)					
DFOV	**20**	**20**	**20**	**25**	**25**
Recon Type	**Detail**	**Detail**	**Detail**	**Detail**	**Detail**
WW/WL	**450/50**	**450/50**	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**	**Plus**	**Plus**
Recon Option					
ASiR/ASiR256/DLIR	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**
Slice Thickness (mm)	**3.75**	**3.75**	**3.75**	**3.75**	**3.75**
Interval (mm)	**2.25**	**2.25**	**2.25**	**2.25**	**2.25**
Recon 2 (Secondary)					
DFOV	**16**	**16**	**16**	**16**	**16**
Recon Type	**Bone Plus**	**Bone Plus**	**Bone Plus**	**Bone Plus**	**Bone Plus**
WW/WL	**2500/350**	**2500/350**	**2500/350**	**2500/350**	**2500/350**
Recon Option	**Plus**	**Plus**	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**None**	**None**	**None**	**None**	**None**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**	**0.625**	**0.625**
Recon 3 (Secondary)					
DFOV	**20**	**20**	**20**	**25**	**25**
Recon Type	**Detail**	**Detail**	**Detail**	**Detail**	**Detail**
WW/WL	**450/50**	**450/50**	**450/50**	**450/50**	**450/50**
Recon Option	**Plus**	**Plus**	**Plus**	**Plus**	**Plus**
Recon Option	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**	**IQ Enhance**
ASiR/ASiR256/DLIR	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**	**40% / 20% / Medium**
Slice Thickness (mm)	**1.25**	**1.25**	**1.25**	**1.25**	**1.25**
Interval (mm)	**0.625**	**0.625**	**0.625**	**0.625**	**0.625**

16 & 32 Slice Scanner Exceptions:

1. The 0.625mm slice thickness x 0.312mm interval Recon should be 1.25mm slice thickness x 0.625mm interval on 16 and 32 slice CT scanners. The 16 and 32 slice scanners are only able to recon down to 0.625mm slice thickness when using 10mm and/or 20mm beam collimation respectively. However, when using 20mm and/or 40mm beam collimation, they are only capable of reconstructing to 1.25mm slice thickness.
2. MARS feature is not an option.
3. IQ Enhance feature requires thin slices (1.25mm or less) with an interval of half (or less). On older scanner models, in order to enable IQ Enhance at 0.625 mm slice thickness, the interval must be set to 0.311 mm instead of 0.312 mm.

DLIR Limitations:

1. DLIR is not available on the Primary Recon.
2. DLIR is only compatible with the Standard Algorithm. So, in instances where the primary recon is Soft algorithm,(i.e. many Neuro Protocols) the subsequent recons will be in Standard Algorithm to enable DLIR. The slight difference between the Soft and Standard Algorithms is outweighed by the improvement in image quality with DLIR enabled.
3. DLIR requires an interval exactly half of the slice thickness.
4. DLIR doesn't allow an interval of 0.312 mm. So, if you are on a DLIR enabled scanner, the thin 0.625 recon will be at 0.625x0.625 mm. On all other scanners the thin recon will be at 0.625x0.312 mm.