TRA Medical Imaging
P.O. Box 1535, Tacoma, WA 98401 | MAIN (253) 761-4200 | TOLL FREE (866) 761-4200 | www.tranow.com

CTA Abdomen and Pelvis with Bilateral Runoffs

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In accordance with the ALARA principle, TRA policies and protocols promote the utilization of radiation dose reduction techniques for all CT examinations. For scanner/protocol combinations that allow for the use of automated exposure control and/or iterative reconstruction algorithms while maintaining diagnostic image quality, those techniques can be employed when appropriate. For examinations that require manual or fixed mA/kV settings as a result of individual patient or scanner/protocol specific factors, technologists are empowered and encouraged to adjust mA, kV or other scan parameters based on patient size (including such variables as height, weight, body mass index and/or lateral width) with the goals of reducing radiation dose and maintaining diagnostic image quality.

If any patient at a TRA outpatient facility requires CT re-imaging, obtain radiologist advice prior to proceeding with the exam.

The following document is an updated CT protocol for all of the sites at which TRA is responsible for the administration, quality, and interpretation of CT examinations.

Include for ALL exams

- **Scout**: Send all scouts for all cases
- **Reformats**: Made from *thinnest* **source** acquisition
  - Scroll Display
    - Axial recons - Cranial to caudal
    - Coronal recons - Anterior to posterior
    - Sagittal recons - Right to left
  - Chest reformats should be in separate series from Abdomen/Pelvis reformats, where applicable
- **mAs**
  - Prefer: Quality reference mAs for specific exam, scanner and patient size
  - Auto mAs, as necessary

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CTA Abdomen and Pelvis With Run-Offs

CTA Abdominal Aorta + Run-Offs

Indication: Peripheral arterial disease (PAD), cold foot, trauma, etc.

***NOTES*:**

- **Non-Contrast**: Rad should be contacted in patients < 40 yo to discuss if necessary.
- **Delayed phase**: Knees to feet (cranial to caudal), *immediately* after arterial phase
- **Tera Recon**: Auto-route arterial axial recons (thins--0.6 mm or similar, and non-thins--2mm or similar) to Tera Recon

Patient Position: Supine, feet down with arms above head

Scan Range (CC z-axis): Hepatic dome through feet

IV Contrast Dose, Flush, Rate, and Delay:

- Dose: (modify volume if using something other than Isovue 370)
  - < 250 lbs 100 mL Isovue 370
  - >250 lbs 120 mL Isovue 370
- Flush: 50 mL saline
- Rate: 3 mL/sec

Acquisitions: 3 (non-contrast, arterial, delay)

NOTES:

- Noncontrast (if patient is less than 40 years old please call radiologist as non-con may not be needed)
- Breathing: End inspiration
- kV: Scanner specific kV control (care kV for Siemens) or kV 100 for < 150 lbs, kV 120 for > 150 lbs

- **Non contrast phase** (if patient is less than 40 years old please call radiologist as non con may not be needed)
  - Coverage: Diaphragm to feet
  - Acquisition helical thickness (slice) 1-1.2 mm
    - NOTE: 2-2.5 mm if scanner is at risk of overheating
- **Arterial phase**
  - Coverage: Diaphragm through feet
  - Trigger bolus off descending aorta, threshold 100 HU. If trigger bolus not possible, use delay of 30sec.
  - Acquisition helical thickness (slice) 0.6-0.625 mm
- **Delay phase**
  - Coverage: feet to knees
  - Scanned *cranial to caudal* immediately after arterial scan (no separate breathing instructions)
  - Acquisition helical thickness (slice) 0.6-0.625 mm

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Series + Reformats:

- **Non-contrast** (if done)
  - Axial 1.2-1.5 mm soft tissue kernel
    - **Axial 2-2.5mm is okay if performed on scanner that overheats**
- **Arterial**
  - Thin Axial 0.6-0.625 mm (thinnest axial recon possible) ST kernel (***send to TERA RECON***)
  - Axial (not thin) 2-2.5 mm soft tissue kernel (***TERA RECON***)
  - Coronal Abdomen/Pelvis 2 mm soft tissue kernel
  - Sagittal Abdomen/Pelvis 2 mm soft tissue kernel
  - Coronal Lower extremities (bifurcation to feet) 2 mm soft tissue kernel
  - Sagittal Lower extremities (bifurcation to feet) 2 mm soft tissue kernel
  - Coronal MIP 5 x 2 mm soft tissue kernel, Full FOV

- **Delay** (feet to knees)
  - Axial 0.6-0.625 mm vascular or soft tissue kernel

*****Machine specific protocols are included below for reference****

Machine specific recons (axial ranges given above for machine variability):

***NON-CONTRAST PHASE - Soft tissue (ST) Kernel, machine-specific thickness (axial):**

- GE = 1.25 mm
- Siemens = 1.2 mm (or 1.5 mm on older generation)
- Toshiba = 1.5 mm

- **see note above for thickness if working on scanner that overheats**

***THIN, AXIAL ARTERIAL PHASE - Soft tissue (ST) Kernel, machine-specific thickness (axial):**

- GE = 0.625 mm
- Siemens = 0.6 mm
- Toshiba = 0.625 mm

***AXIAL ARTERIAL PHASE (not thin) - Soft tissue (ST) Kernel, machine-specific thickness (axial):**

- GE = 2.5 mm
- Siemens = 2 mm
- Toshiba = 2 mm

***AXIAL DELAYED PHASE - Soft tissue (ST) Kernel, machine-specific thickness (axial):**

- GE = 0.625 mm
- Siemens = 0.6 mm
- Toshiba = 0.625 mm

General Comments

NOTE:
Use of IV contrast is preferred for most indications *aside from*: pulmonary nodule follow-up, HRCT, lung cancer screening, and in patients with a contraindication to iodinated contrast (see below).

Contrast *Relative* Contraindications

- **Severe contrast allergy**: anaphylaxis, laryngospasm, severe bronchospasm
  - If there is history of severe contrast allergy to IV contrast, avoid administration of oral contrast
- **Acute kidney injury (AKI)**: Creatinine increase of greater than 30% over baseline

  - Reference hospital protocol (creatinine cut-off may vary)
- **Chronic kidney disease (CKD) *stage 4 or 5*** (eGFR < 30 mL/min per 1.73 m^2) **NOT** on dialysis
  - Reference hospital protocol

Contrast Allergy Protocol

- Per hospital protocol
- Discuss with radiologist as necessary

Hydration Protocol

- For eGFR **30-45 mL/min** per 1.73 m^2: Follow approved hydration protocol

IV Contrast (where indicated)

- Isovue 370 is the default intravenous contrast agent
  - See specific protocols for contrast volume and injection rate
- If Isovue 370 is unavailable:
  - Osmolality 350-370 (i.e., Omnipaque 250): Use same volume as Isovue 370
  - Osmolality 380-320 (i.e., Isovue 300, Visipaque): Use indicated volume **+ 25 mL** (*not to exceed 125 mL total contrast*)

Oral Contrast

- Dilutions to be performed per site/hospital policy (unless otherwise listed)
- Volumes to be given per site/hospital policy (unless otherwise listed)
- TRA-MINW document is available for reference if necessary (see website)

Brief Summary

- Chest only
  - ✓ Chest W, Chest WO
  - ✓ CTPE
  - ✓ HRCT
  - ✓ Low Dose Screening/Nodule
    - None

- Pelvis only
  - ✓ Pelvis W, Pelvis WO
    - Water, full instructions as indicated

- Routine, excluding chest only and pelvis only
  - ✓ Abd W, Abd WO
  - ✓ Abd/Pel W, Abd/Pel WO
  - ✓ Chest/Abd W, Chest/Abd WO
  - ✓ Chest/Abd/Pel W, Chest/Abd/Pel WO
  - ✓ Neck/Chest/Abd/Pel W, Neck/Chest Abd Pel WO
  - ✓ CTPE + Abd/Pel W

  - TRA-MINW offices: Dilute Isovue-370
  - Hospital sites:
    - ED: Water, if possible
    - Inpatient: prefer Dilute Isovue 370
      - Gastrografin OK if Isovue unavailable
      - Avoid Barium (Readi-Cat)
    - FHS/MHS Outpatient: Gastrografin and/or Barium (Readi-Cat)

- Multiphase abdomen/pelvis
  - ✓ Liver, pancreas
    - Water, full instructions as indicated
  - ✓ Renal, adrenal
    - None

- CTA abdomen/pelvis
  - ✓ Mesenteric ischemia, acute GI bleed, endograft
    - Water, full instructions as indicated

- Enterography
  - Breeza, full instructions as indicated

- Esophogram
  - Dilute Isovue 370, full instructions as indicated

- Cystogram, Urogram
  - None

- Venogram
  - Water, full instructions as indicated