

## **CTA Abdomen and Pelvis 3-phase (GI Bleed, Mesenteric Ischemia, or EVAR/stent/graft)**

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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.

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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
- **kVp**
  - 100 @ <140lbs
  - 120 @ >140lbs
- **mAs**
  - Prefer: Quality reference mAs for specific exam, scanner and patient size
  - Auto mAs, as necessary

## CTA Abdomen and Pelvis 3 - Phase

**Indication:** GI bleed, mesenteric ischemia, vasculitis, s/p EVAR or vascular surgery, etc.

**\*NOTES\*:**

- **Non-Contrast:** Rad should be contacted in patients < 40 yo to discuss if necessary.
- **VIA / TERA:** Auto-route arterial axial recons (thin and thick) to Via / Tera Recon

**Patient Position:** Supine, feet down with arms above head

**Scan Range (CC z-axis):** Hepatic dome through lesser trochanters

**IV Contrast Dose, Flush, Rate, and Timing:**

- Dose & Rate: (modify volume if using something other than Isovue 370; 20-gauge or larger IV, at least 4 inches above wrist or pressure injectable line)
  - < 200 lbs            80 mL Isovue 370, 3 cc/sec
  - > 200 lbs            100 mL Isovue 370, 4 cc/sec
- Flush: 50 mL saline
- IV access: 20-gauge or larger IV, at least 4 inches above wrist or pressure injectable line
- Timing:  
Arterial: Trigger off of Distal Thoracic Aorta (threshold 100 HU) just above diaphragm  
Delayed acquisition: 90 seconds from start of contrast administration

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

**NOTES:**

- Noncontrast may not be necessary in patients < 40 yo (contact Rad to discuss).
- Breathing (all phases): End inspiration
- Coverage (all phases): 1cm above diaphragm through lesser trochanters.
- **Non contrast phase** (contact rad if < 40 yo)
  - Acquisition helical thickness (slice) 1 - 1.25 mm
- **Arterial phase**
  - Trigger bolus off descending aorta, threshold 100 HU. If trigger bolus not possible, use delay of 30sec.
  - Acquisition helical thickness (slice) 0.6 - 1 mm
- **Delayed (Late Venous) phase**
  - Acquisition helical thickness (slice) 1 - 1.25 mm
  - Delay of 90 seconds

**Series + Reformats:**

- **Non-contrast**
  - Axial 1 - 1.25 mm soft tissue kernel ("Noncon")
- **Arterial**
  - Axial 0.625 – 1 mm vascular or soft tissue kernel (\***Via / Tera\***)
  - Axial 2 - 2.5 mm vascular or soft tissue kernel (\***Via / Tera\***)
  - Coronal 1 – 1.25 x 1 – 1.25 mm soft tissue kernel
  - Sagittal 1 – 1.25 x 1 – 1.25 mm soft tissue kernel
  - Coronal MIP 5 x 2 mm soft tissue kernel ("MIP")
- **Venous**
  - Axial 1 - 1.25 mm soft tissue kernel ("VenAx")
  - Coronal 2 x 2 mm soft tissue kernel ("VenCor")
  - Sagittal 2 x 2 mm soft tissue kernel ("VenSag")

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

\*AXIAL NON CON & VENOUS PHASE - machine-specific thickness (axial):

- GE = 1.25 mm
- Siemens = 1-1.25 mm
- Toshiba = 1 mm

\*THIN, AXIAL ARTERIAL PHASE - machine-specific thickness (axial):

- GE = 0.625 mm
- Siemens = 0.75-0.8 mm
- Toshiba = 1 mm

\*NOT THIN AXIAL ARTERIAL PHASE - machine-specific thickness (axial):

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

\* ARTERIAL SAG & COR - machine-specific thickness (axial):

- GE = 1.25 x 1.25 mm
- Siemens = 1-1.25 x 1-1.25 mm

- Toshiba = 1 x1 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<sup>2</sup>) **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<sup>2</sup>: 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