

CT Enterography

CT Abdomen + Pelvis W (single or multi-phase)

Reviewed By: Spencer Lake
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Contact: (866) 761-4200, Option 1

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-MINW 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-MINW 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

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Indications:

- **Single phase (arterial enteric):** Known or suspected inflammatory bowel disease (Crohn's or ulcerative colitis, not in the perioperative period), suspected small bowel disease (e.g., celiac disease), chronic diarrhea and/or abdominal pain
- **Multiphase (noncon, arterial enteric, late venous):** Anemia of unknown etiology (after negative colonoscopy and upper endoscopy) or evaluate for small bowel mass

Patient Position: Supine, feet down with arms above head

Scan Range (CC z-axis): 1 cm above diaphragm through lesser trochanter

Prep: No solids (liquids OK) for 3 hours prior to examination

- Note: Okay to continue examination if prep is incomplete or not done

Oral Contrast: 48 oz Breeza (3 bottles) + water

- Breeza: 1 bottle at 60 minutes prior, 1 bottle at 40 minutes prior, 1 bottle at 20 minutes prior (image at 60 minutes)
- THEN: 500 mL water on scanner table

IV Contrast Dose, Flush, Rate, and Delay:

- Dose: 100 mL Isovue 370 (modify volume if using something other than Isovue 370)
- Flush: 40 mL saline
- Rate: 4 mL/sec (20-gauge or larger IV)
- Delay: Arterial (bolus tracking or 45 s) +/- late venous 90s (only for anemia, small bowel mass)

Acquisitions: 1 or 3, as below

If indication for single phase (i.e., IBD): 1 (post-contrast only)

- **Arterial (Enteric) Phase** - BOLUS TRACKING on descending aorta just above diaphragmatic hiatus, start scan 20 seconds after ROI exceeds 150 HU.
 - ONLY IF scanner is NOT able to perform bolus tracking, use 45 second delay

If indication for multiphase (i.e., anemia, SB mass): 3 (1 non-contrast and 2 post-contrast)

- **Non-contrast**
- **Arterial (Enteric) Phase** - BOLUS TRACKING on descending aorta just above diaphragmatic hiatus, start scan 20 seconds after ROI exceeds 150 HU.
 - ONLY IF scanner is NOT able to perform bolus tracking, use 45 second delay
- **Late Venous Phase** - 90 second delay

Series + Reformats for each acquisition (1 or 3):

- a. Axial 2-2.5 mm ST kernel
- b. Coronal 2 mm ST kernel
- c. Sagittal 2 mm ST kernel

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

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

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

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

Source(s): <https://www.acr.org/~media/99D260410DF44A3BA01F1AB716DE8F2F.pdf>

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 m²) **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 m²: 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