

TRA-MINW

CT Urogram/IVP CT Abdomen + Pelvis WO W – NC.Split Delay

Reviewed By: Rachael Edwards, MD; Anna Ellermeier, MD; Brett Mollard, MD
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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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CT Urogram/IVP **CT Abdomen + Pelvis WO W – NC.Split Delay**

Indication: Hematuria (microscopic or macroscopic), evaluate or follow-up urothelial tumor (urology orders), evaluate for upper tract disease with known bladder cancer

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: None

IV Contrast, NaCl and Delay/Timing:

1. 200 mL NaCl @ 2 mL/sec
2. Scan CT Abd Pel WO
3. 35 mL Isovue 370 @ 2 mL/sec immediately followed by 200 mL NaCl @ 2mL/sec
4. **Wait 13 minutes**
5. 75 mL Isovue 370 @ 2 mL/sec
6. Scan CT Abd Pel W (nephrographic = 120 s delay)

Acquisitions: 2 for most (1 non-contrast + 1 post-contrast); 3 if added delay (1 non-contrast + 2 post-contrast)

- **Non-contrast**
 - NOTE: If CT Abd/Pel WO (CT KUB) has been performed within 60 days and is available in PACS, do NOT need to do the NC acquisition
 - Please place note into PACS to indicate this
- **Split Delay Phase** (nephrographic/excretory): 120 second delay
- **Added delay:** *Technologists can decide to do an additional delayed acquisition if ureters are inadequately opacified*
 - Do not need to contact radiologist, unless patient is < 40 years old
 - Delay timing: approximately 5 minutes after acquisition of split-delay phase
 - Same reconstructions as Split Delay Phase (see below)

Series + Reformats:

1. **Non-contrast**
 - a. Axial 2-2.5 mm ST kernel
2. **Split Delay Phase (Nephrographic/Excretory)**
 - a. Axial 2-2.5 mm ST kernel
 - b. Coronal 2 mm ST kernel
 - c. Coronal ST MIP 5 x 2 mm
 - d. Sagittal 2 mm ST kernel
 - e. Send thinnest source axial recons ST kernel to PACS
3. **If additional delay acquired**
 - a. Axial 0.625 mm or equivalent (0.5-1.5 mm, thinnest possible recon)

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*****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/E690CB12905B44788B9E4175D68B5C07.pdf>

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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

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- 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