TRA MEDICAL IMAGING

253-761-4200
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tranow.com

CT Pancreas 3 Phase

CT Abdomen WO W - NC.A.V

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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-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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Indication:

- Evaluate pancreatic mass (solid or cystic) or pancreas protocol ordered by GI or other specialist
  - NOTE: MR is preferred if possible
- Follow-up acute pancreatitis to assess for pancreatic necrosis or hemorrhage
- For most indications, first post-contrast phase will be late-arterial. *If indication is neuroendocrine tumor evaluation ONLY, first post-contrast phase will be early-arterial.*

COMMENTS:

- First time/initial elevated lipase or rule-out pancreatitis = routine Abd/Pel (70s, single phase)
- Chronic pancreatitis = routine Abd (70s, single phase)

Patient Position: Supine, feet down with arms above head

Scan Range (CC z-axis): 1 cm above diaphragm through superior iliac crest

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: 500 mL water 20 minutes before scanning, 250 mL on scanner table immediately pre-scan

IV Contrast Dose, Flush, Rate, and Delay:

- Dose: (modify volume if using something other than Isovue 370)
  - < 200 lbs 75 mL Isovue 370
  - 200-250 lbs 100 mL Isovue 370
  - >250 lbs 125 mL Isovue 370
- Flush: 40 mL saline
- Rate: 4 mL/sec (20-gauge or larger IV)
- Delay: Late arterial (bolus tracking or 40s) or early arterial (for neuroendocrine tumor evaluation only, 25s), Venous 70s

For most indications:

Acquisitions: 3 (1 non-contrast + 2 post-contrast)

- **Non-contrast**
- **Late Arterial Phase -** BOLUS TRACKING on descending aorta just above hiatus, start scan 15 seconds after ROI exceeds 150 HU.
  - ONLY IF scanner is NOT able to perform bolus tracking, use 40 second delay
- **Venous Phase -** 70 second delay

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If indication is evaluation for neuroendocrine tumor:
Acquisitions: 3 (1 non-contrast + 2 post-contrast)
- **Non-contrast**
- **Early Arterial Phase –** 25 second delay
- **Venous Phase -** 70 second delay

Series + Reformats:
1. **Non-contrast**
   a. Axial 2-2.5 mm ST kernel
2. **Arterial Phase**
   a. Axial 2-2.5 mm ST kernel
   b. Coronal 2 mm ST kernel
   c. Sagittal 2 mm ST kernel
3. **Venous Phase**
   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: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4069314/

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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 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

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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