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

EKG Gated CTA Heart / Valve / Ascending Aorta

Reviewed By: Dan Verdini, MD
Last Reviewed: June 2025

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 outpatient facility requires re-imaging, please obtain radiologist advice prior to proceeding with 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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Indication: Ascending aortic aneurysm / dilation, Ascending aortic length (AAL), Valve pathology

Order: CTA heart (Not coronary)

Patient Position: Supine, feet down with arms above head

Scan Range (CC z-axis): Just above aortic arch to bottom of heart

IV Contrast Dose, Flush, Rate and Delay:

- Dose: (modify volume if using something other than Isovue 370)
    - < 200 lbs 80 mL Isovue 370
    - > 200 lbs 100 mL Isovue 370
- Flush: 50 mL saline
- Rate: 4 mL/sec (20g or larger IV, at least 4 inches above wrist, or pressure injectable line)
- Arterial delay: Bolus trigger off of Ascending Aorta (threshold 125HU)

Acquisitions: 1 (Arterial)

NOTES:

- Breathing: End inspiration
- kV (all phases): Scanner specified (Care kV for Siemens, BMI table for GE) or 80kV for < 150lbs, 100kV for 150 – 250 lbs, 120kV for > 250 lbs
- Coverage: For valve / aortic root: carina to bottom of heart
  For thoracic aorta / AAL: lung apices to bottom of heart

- **Arterial phase**
    - Trigger bolus off ascending aorta, threshold 125 HU
    - Acquisition helical thickness (slice) 0.6-0.75 mm
    - EKG gating: Helical, dose-modulated Retrospective with systolic target window (200-440ms); MinDose on Siemens

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Series + Reformats:

- **Arterial**
    - Thin Axial 0.6-0.75* mm, **coned down to aorta,** soft tissue or vascular kernel GE: 'Smart", Siemens: "Best systolic"; (**TERA / VIA**);
    - Axial 75%, 0.6mm (GE only)
    - Multiphase, 0.6mm - .75mm, 200-440ms in increments of 20ms (**TERA / VIA**)
    - Function, 2mm, 0-90% in increments of 10% (**TERA / VIA**)
    - Axial 2-2.5 mm, FFOV, soft tissue kernel (**TERA / VIA**)
    - Coronal 2 x 2 mm, FFOV, soft tissue kernel
    - Sagittal 2 x 2 mm, FFOV, soft tissue kernel
    - Axial MIPS 10 x 2, FFOV, soft tissue kernel ("MIPS")
    - AAL: Ascending aortic length, from aortic annulus to ascending aorta at level of right brachiocephalic artery takeoff, please see screen captures below

Reformat Notes

*On Siemens scanners, for BMI > 35, use 0.75mm thickness for Best systolic and multiphase reformats

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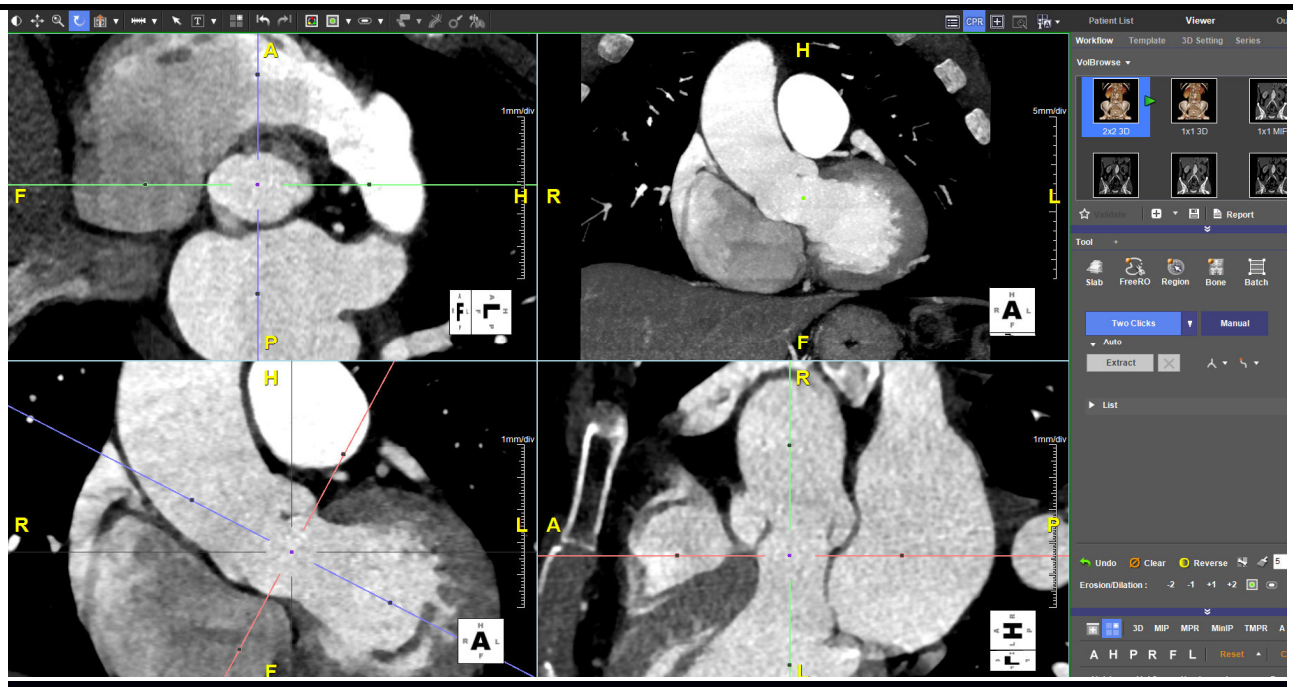

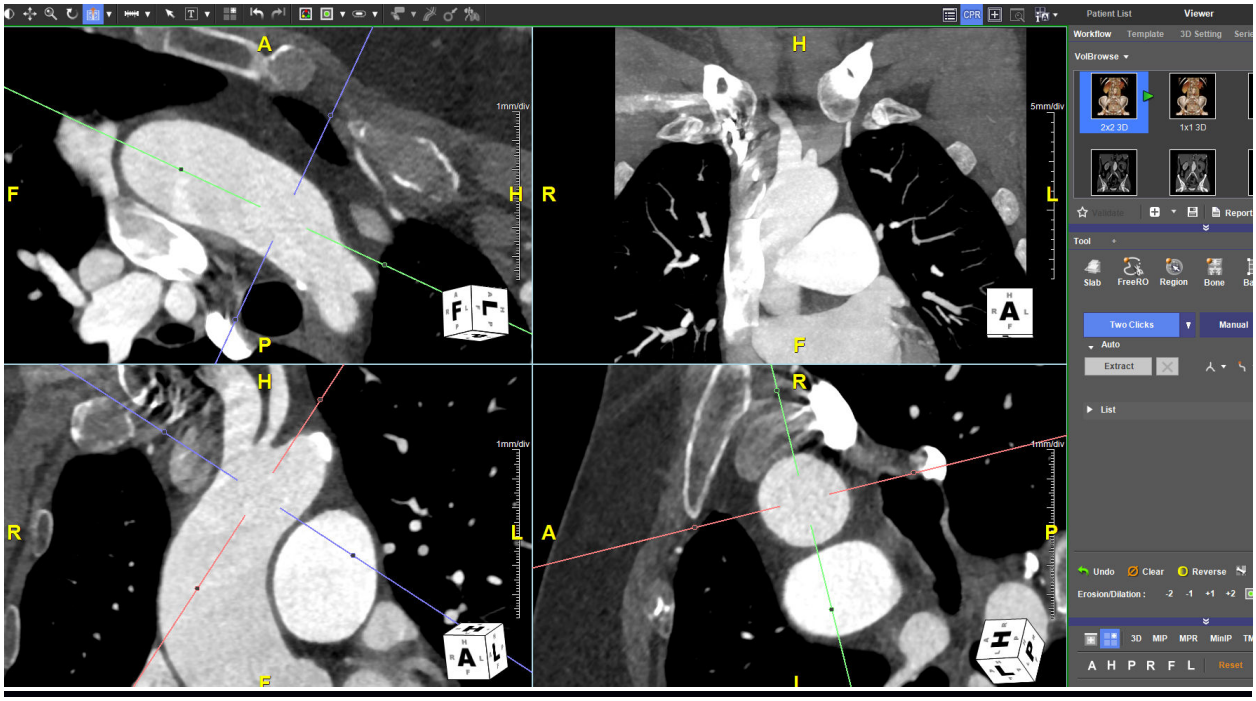

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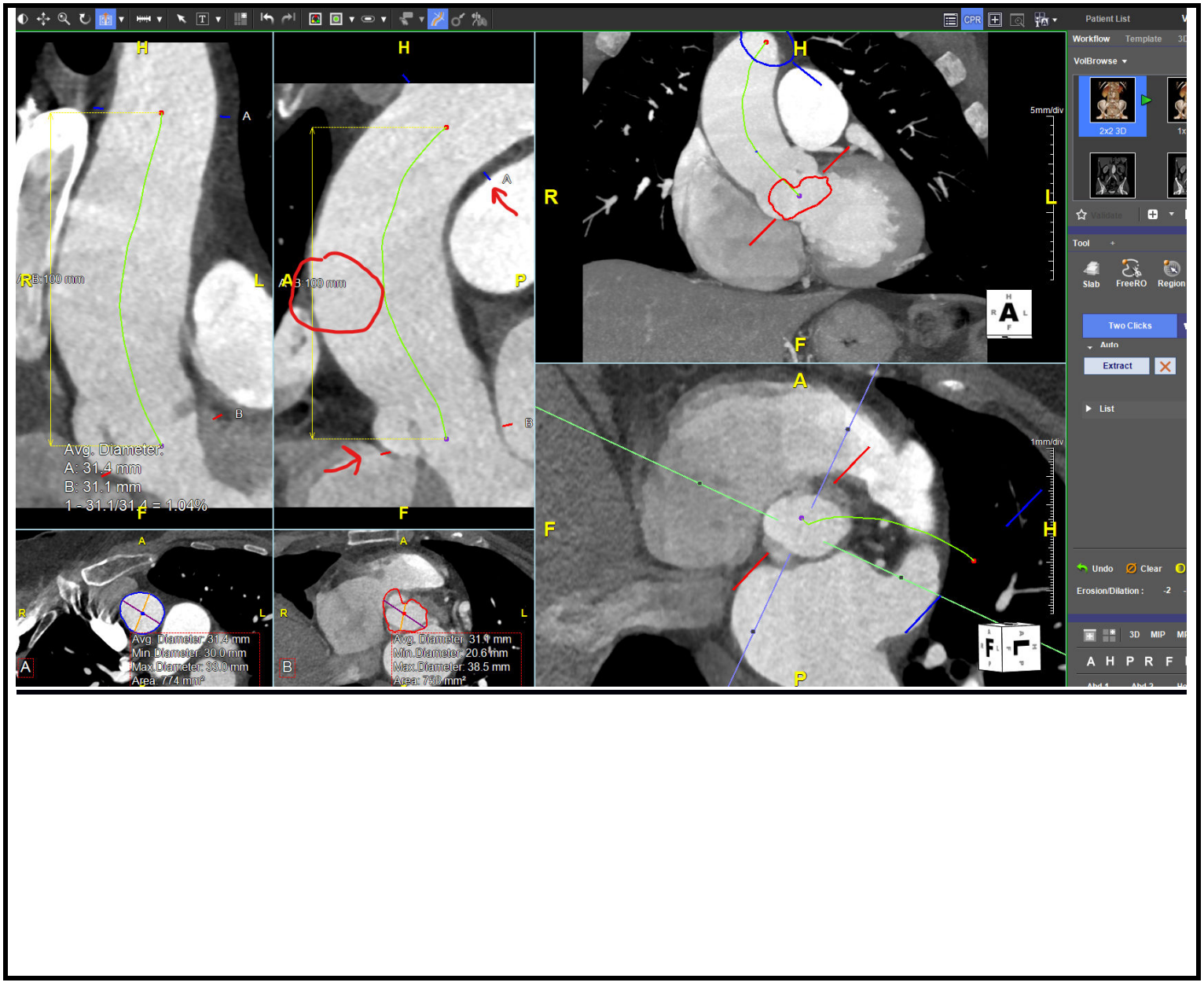

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General Comments

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

- 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

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- Venogram
    - Water, full instructions as indicated