

TRA-MINW

CT Chest Low Dose Nodule Follow-up CT Chest WO

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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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Indications:

Low Dose Nodule Follow-up – “Pulmonary nodule follow-up” in clinical indication WITH prior chest CT available for comparison, prior radiologist reports recommends low dose non-contrast chest CT, LungRads 3 and 4A on prior report from lung cancer screening CT

Please see table at end of this protocol for questions regarding Lung Cancer Screening CT (LDCT) follow-up guidelines for use of Lung Cancer Screen Protocol versus Low Dose Nodule Follow-up

Patient Position: Supine, feet down with arms above head

Scan Range (CC z-axis): Lung apices through L1

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: Not applicable

Acquisitions: 1 (non-contrast)

- **Non-contrast chest (low dose)**
 - **Low dose technique – CTDI vol \leq 3 mGy**
 - **kVp:** 100-140
 - **mAs:** set in combination with kVp to meet CTDI vol dose limit
 - Single breath, full inspiration

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

Series + Reformats:

1. **Non-contrast chest (low dose)**
 - a. Axial 2-2.5 mm ST kernel
 - b. Axial 1.2-1.5 mm lung kernel
 - c. Axial 10 x 2 mm MIP ST kernel
 - d. Coronal 2 mm ST kernel
 - e. Sagittal 2 mm ST kernel

- **Machine specific recons:**

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

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

***Lung Kernel, machine-specific thickness**

- GE = 1.25 mm
- Siemens = 1.2 mm (or 1.5 mm on older generation)

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- Toshiba = 1.5 mm

Source(s):

<https://www.acr.org/~media/99D260410DF44A3BA01F1AB716DE8F2F.pdf>

<http://www.acraccreditation.org/~media/ACRAccreditation/Documents/LCS/Lung-Cancer-Screening-Technical-Specifications.pdf?la=en>

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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

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Low Dose Lung Cancer Screening CT Chest should only be performed every 12 months.

Please call radiologist if less than 12 months between requested screening exams.

<u>Description</u>	<u>LungRADS Category</u>	<u>Management</u>
Incomplete	0	Additional/repeat lung cancer screening CT and/or comparison to prior chest CT examination is needed
Negative (no nodules or definitely benign nodules)	1	Continue annual screening with Low Dose Lung Cancer Screen CT Chest non-contrast in 12 months
Benign appearance or behavior	2	Continue annual screening with Low Dose Lung Cancer Screen CT Chest non-contrast in 12 months
Probably benign	3	6 month Low Dose Nodule Follow-up CT Chest non-contrast**
Suspicious	4A	3 month Low Dose Nodule Follow-up CT Chest non-contrast **PET/CT may be used if solid component ≥ 8 mm.
	4B	Routine CT Chest contrast or non-contrast**, PET/CT, and/or tissue sampling.
Significant finding modifier	S	Schedule as indicated by radiologist in prior report
Prior lung cancer modifier	C	