Diagnostic Imaging Report

Meridian Imaging Centre
12 Radcliffe Boulevard, Suite 4A | Harlington Medical Park
Tel: +1 (604) 882-4100 | Fax: +1 (604) 882-4199
www.meridian-imaging.ca | info@meridian-imaging.ca

Report ID: MIC-2024-09471
Date: 14 November 2024
Time: 09:47 AM
Modality: CT Thorax/Abdomen
Priority: CRITICAL

Patient Information

Full Name	Margaret A. Holloway	**Date of Birth**	03 June 1967 (Age 57)
Patient ID	PAT-00192834	**Sex / Gender**	Female
MRN	MRN-7743-H	**Weight / Height**	68 kg | 164 cm
Referring Physician	Dr. Thomas B. Crane, MD	**Insurance**	Apex Health Plan
Ward / Location	Outpatient – Level 2	**Accession No.**	ACC-2024-48173

Clinical History & Indication

The patient presents with a 6-week history of progressive dyspnoea on exertion, intermittent pleuritic chest pain (right-sided), and a persistent dry cough unresponsive to empirical antibiotic therapy. Past medical history is notable for hypertension (treated with amlodipine 5 mg daily), a remote right knee arthroscopy (2009), and a family history of pulmonary malignancy (maternal uncle). No smoking history. The referring physician has requested CT thorax with contrast and CT upper abdomen to evaluate for pulmonary embolism, parenchymal pathology, and occult mediastinal lymphadenopathy.

Examination Technique

Scanner	Synapse 64-Slice CT	**kVp / mAs**	120 kVp / 280 mAs
Protocol	Contrast-Enhanced (CECT)	**Slice Thickness**	1.5 mm axial, MPR coronal/sagittal
Contrast Agent	Omniscan IV 100 mL	**Injection Rate**	3.5 mL/s via right antecubital IV
Scout View	PA chest + lateral	**Radiation Dose**	CTDIvol 8.4 mGy; DLP 420 mGy·cm
Breathing Phase	Inspiration / expiration	**Reconstruction**	Lung window + mediastinal window

Key Image Panel

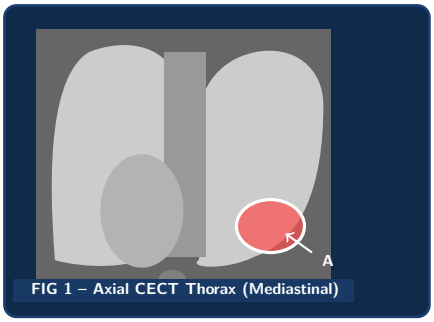

FIG 1 – Axial CECT Thorax (Mediastinal)

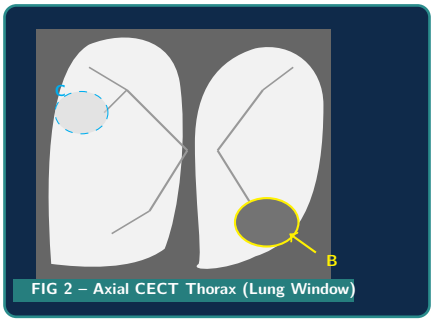

FIG 2 – Axial CECT Thorax (Lung Window)

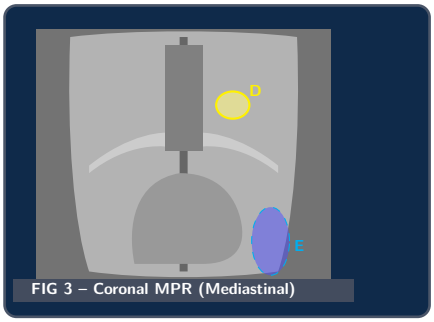

FIG 3 – Coronal MPR (Mediastinal)

Fig 1: Right lower lobe lesion (arrow A). Size: 28 × 22 mm. Irregular margin, mild pleural contact. Level: T8.

Fig 2: Same lesion (arrow B, lung window). Ground glass haze left upper lobe (arrow C), no central necrosis.

Fig 3: Right hilar lymph node (D, 14 mm). Small right pleural effusion (E). No mediastinal shift.

Radiological Findings

Thorax – Parenchyma & Airways

- **Right Lower Lobe Mass (Segment 6):** A well-defined spiculate soft-tissue density nodule measuring **28 × 22 × 20 mm** is identified in the posterior right lower lobe (Figs 1 and 2, annotation A/B). The lesion demonstrates heterogeneous enhancement (HU pre: 28; HU post: 67). Margins are lobulated with pleural tethering. No cavitation or calcification.
- **Ground Glass Opacity – Left Upper Lobe:** A **12 × 9 mm** area of ground glass attenuation in the anterior segment of the left upper lobe (Fig 2, annotation C). No consolidation or air-bronchogram. Stable pattern; unchanged from prior CT (16 June 2024). Likely represents sub-acute inflammatory change.
- **Airways:** Trachea midline. Main bronchi patent. No endobronchial lesion. Mild wall thickening of the right lower lobe bronchus, consistent with peribronchial cuffing. No mucous plugging.
- **Pleura:** Small right-sided pleural effusion estimated at 60–80 mL (Fig 3, annotation E). No left effusion. No pneumothorax. No empyema.

Mediastinum & Cardiovascular

- **Heart:** Mildly enlarged (CTR ≈0.53). No pericardial effusion. Coronary artery calcification: mild LAD deposits (Agatston ≈ 42).
- **Aorta:** Normal calibre ascending (30 mm) and descending (22 mm) aorta. No aneurysm or dissection.
- **Pulmonary Arteries:** No filling defect in central or lobar pulmonary arteries to indicate PE. Subsegmental vessels not fully evaluated.
- **Lymph Nodes:** Right hilar node 14 mm short axis (Fig 3, arrow D) – borderline enlarged. Right paratracheal station 4R node 9 mm. No mediastinal bulk.

Upper Abdomen (Limited)

- **Liver:** Homogeneous parenchyma. No focal lesion. Normal hepatic veins. Mild fatty change (HU 42).
- **Gallbladder & Biliary:** Gallbladder present; two small non-obstructing gallstones (max 8 mm). Common bile duct 5 mm – within normal limits.
- **Spleen / Pancreas / Adrenals:** Spleen 11 cm, homogeneous. Pancreas unremarkable. Adrenal glands symmetric, no adenoma.
- **Kidneys:** Both kidneys normal size and enhancement. A 6 mm simple cortical cyst right kidney (Bosniak I).

Lesion Measurement Summary

Lesion	Location	Size (mm)	HU Pre	HU Post	Enhancement	Status
RLL Spiculate Mass	Post Seg 6, RLL	$28 \times 22 \times 20$	28	67	+39 HU	CRITICAL
LUL Ground Glass	Ant Seg, LUL	12×9	–10	–8	Minimal	MILD
R Hilar Lymph Node	Station 10R	14×11	32	58	+26 HU	MODERATE
R Pleural Effusion	Right Pleural Space	~60–80 mL	–	–	N/A	MODERATE
LAD Calcification	Proximal LAD	Agatston 42	–	–	N/A	MILD
Right Renal Cyst	Upper Pole, RK	6	5	6	None	NORMAL

Radiological Impression

1. **Spiculate right lower lobe mass (28 mm):** The morphological characteristics — lobulated margin, pleural tethering, and moderate post-contrast enhancement — are highly suspicious for primary lung malignancy (clinical T1c N1 staging pending PET-CT). **Urgent multidisciplinary tumour board discussion is recommended.**
2. **Borderline right hilar lymphadenopathy (14 mm):** In the clinical context, this raises concern for regional nodal involvement. PET-CT and/or endobronchial ultrasound (EBUS) guided biopsy advised.
3. **Small right pleural effusion:** Likely reactive; may warrant thoracocentesis for cytological analysis if increasing on follow-up.
4. **Left upper lobe ground glass opacity:** Indeterminate but stable on comparison. Repeat HRCT in 3 months if current lesion is confirmed malignant.
5. **Incidental findings:** Mild left ventricular enlargement (clinical correlation); gallstones (conservative management); right renal Bosniak I cyst (no follow-up needed).

Recommended Next Steps

1. **PET-CT whole body** within 5 working days for accurate staging of the RLL mass.
2. **Bronchoscopy** ± **EBUS-TBNA** to obtain histopathological diagnosis and nodal sampling of station 10R/4R.
3. **Pulmonary function tests (PFTs)** prior to any surgical consideration.
4. **Cardiology referral** re: coronary artery calcification and mild cardiomegaly.
5. **Multidisciplinary Tumour Board (MDT)** review – please submit imaging and pathology results to the Thoracic Oncology MDT (Meridian Apex Oncology Network).
6. Comparison with any outside imaging obtainable – referring physician to arrange transfer of prior studies.

Prior Study Comparison

Study Date	Modality	Institution	Relevant Finding
16 June 2024	CT Thorax (non-contrast)	Apex Diagnostic Labs	LUL GGO 11 mm (stable); no RLL mass reported
03 Feb 2024	Chest X-Ray PA	Nexa Community Clinic	RLL opacity, attributed to infection; no follow-up
09 Nov 2022	CT Thorax (non-contrast)	Meridian Imaging Centre	No parenchymal mass; normal hilar silhouette

Note: The RLL mass appears to represent an interval development between June 2024 and November 2024, underscoring the need for urgent histological evaluation.

Reporting Radiologist

Name: Dr. Rachel S. Thornton, FRCR, FCAR
Subspecialty: Cardiothoracic & Oncologic Radiology
Licence No.: CPSBC-74291-R
Institution: Meridian Imaging Centre, Harlington
Report Prepared: 14 November 2024, 11:32 AM
Electronically Verified: 14 November 2024, 13:05 PM

Rachel S. Thornton

Signature / Electronic Authentication

QA Reviewed By: Dr. Alan Park, MD, FRCR
QA Date: 14 Nov 2024, 13:05 PM
Peer Review Score: 4 / 4 (Concordant)

This report was generated and electronically signed by the above-named radiologist. Results have been communicated to the referring physician Dr. T. B. Crane via secure EMR portal. This document constitutes a confidential medical record.

Structured Reporting Addendum

Lung-RADS 2022 Assessment Category

Category:	**4X – Suspicious (Category 4)**
Modifier:	X (additional imaging/clinical info)
Malignancy Risk:	>15%
Management:	Diagnostic CT, PET-CT, tissue sampling
Prior Category:	2 (June 2024, non-contrast CT)
Change:	Upgrade from Cat 2 → Cat 4X

Lung-RADS Category Scale

Provisional Radiological TNM Staging (8th Ed.)

T Stage:	T2a (tumour >2 cm, ≤3 cm)	**N Stage:**	N1 (ipsilateral hilar node)
M Stage:	Mx (distant metastasis not assessed)	**Group:**	IIB (T2a N1 Mx) – provisional
Histology:	Pending biopsy	**AJCC Group:**	IIB

Important: Radiological staging is provisional. Final staging requires histopathological and PET-CT data. Management decisions must not be based on imaging alone.

Radiation Dose Record

CTDIvol:	8.4 mGy
DLP:	420 mGy·cm
SSDE:	9.1 mGy
Scan Length:	490 mm
Diagnostic Ref. Level:	Below national DRL
As Low As Reasonably:	Achieved (ALARA)

Contrast Administration Record

Agent:	Iodixanol (Omniscan)
Concentration:	320 mgI/mL
Volume:	100 mL IV
Rate:	3.5 mL/s
eGFR (pre-scan):	74 mL/min/1.73m^2
Adverse Reaction:	None observed

Differential Diagnosis

#	Diagnosis	Likelihood	Supporting / Against Features
1	Primary lung adenocarcinoma	Very High	Spiculate margins, enhancement pattern, RLL location, hilar node; age/sex profile
2	Squamous cell carcinoma	Moderate	Central-ish hilar node; lacks cavitation and squamous cell classic features
3	Pulmonary carcinoid	Low	Enhancement higher than expected; location atypical
4	Metastatic deposit	Low	No known primary; single lesion; no prior malignancy history
5	Organising pneumonia	Very Low	No prior antibiotic response; spiculate morphology atypical

Image Quality Metrics

Parameter	Value	Parameter	Value	QA Pass
SNR (lung window)	18.4	Motion artefact	Minimal	✔
CNR (lesion/lung)	11.2	Beam hardening	None	✔
Reconstruction kernel	B40f smooth	Ring artefact	Absent	✔
Field of view	380 mm	Streak artefact	Minimal	✔
Matrix	512×512	Overall Quality	Diagnostic	✔

Communication & Critical Value Notification Log

Date/Time	Method	Recipient	Message Summary
14 Nov 2024, 11:35	Phone (direct)	Dr. T. B. Crane	Critical finding verbally communicated: suspicious RLL mass, urgent action required
14 Nov 2024, 12:00	Secure EMR	Apex Health Admin	Preliminary report uploaded, status flagged CRITICAL
14 Nov 2024, 13:10	Secure EMR	Dr. T. B. Crane	Final signed report uploaded to patient chart
14 Nov 2024, 13:15	Fax	Meridian MDT Secretariat	Report + image series transmitted for tumour board agenda

Electronically signed – Dr. Rachel S. Thornton, FRCR 14 November 2024 13:05 — MIC-2024-