# Improving Lung-RADS Reporting in a General Imaging Practice: A Successful Quality Initiative

**Margit Szabari[1,2], MD PhD, Shawdi Manouchehr-Pour[1,2], MD, Priyanka Dube[1,2], DO, Monica Deskhmukh[1,2], MD, Evan Raff[1,2], MD, Karoly Viragh[1,2], MD**

[1]David Geffen School of Medicine at UCLA, Los Angeles, CA, [2]Olive View Medica Center, Sylmar, California

## Background

**Introduction**: Our hospital, Olive View-UCLA Medical Center (OVMC) is a large safety-net county hospital in the Los Angeles County Department of Health Services network with academic affiliation with UCLA. At OVMC, low-dose computed tomography (LDCT) is primarily (>90%) used for lung cancer screening (LCS) in the appropriate high-risk population, but it is also used occasionally in the surveillance of incidental pulmonary nodules and, increasingly, in pneumoconiosis screening (1, 2, 3, 4, 5). To clarify management of the findings, imaging guidelines have been devised, such as the American College of Radiology Lung Imaging Reporting and Data System (Lung-RADS), the Fleischner Society Guidelines for incidental pulmonary nodules, and the International Classification of CT for Occupational and Environmental Respiratory Disease (ICOERD) (1, 2, 3, 4, 5).

**Problem**: Since LDCT examinations are frequently ordered by general clinical practitioners and frequently interpreted by non-thoracic radiologists, we noticed inconsistencies in management. Notably, many LDCT radiology reports were missing Lung-RADS categories with recommendations.

**Value**: Consistently assigning the appropriate Lung-RADS category to radiology reports provides clear guidance to management (surveillance vs workup) with improve time and workflow efficiency and avoidance of extra procedures.

## Objectives

While a larger county-wide quality improvement project was initiated to address the overall issue, our OVMC Radiology Department decided to focus on improving LCS LDCT reporting.

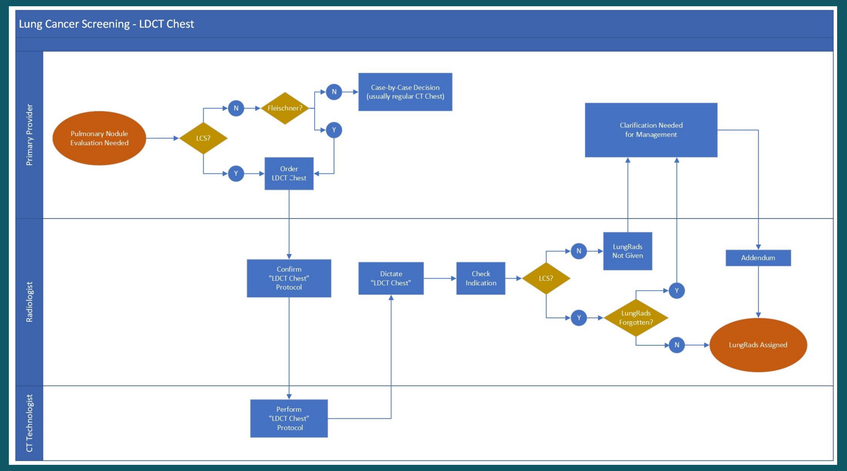
**SMART (Specific, Measurable, Achievable, Relevant, Time-bound) Goal**:
Percentage (%) of LCS LDCT reports providing LungRADS category at least 90% in 6-mos.

## Methods

The A3 Quality Improvement (QI) method was applied. An appropriate QI team was designated in the fall of 2023. Current state analysis was performed, identifying the relevant processes and players, which was followed by seven-whys and root cause analysis to identify the major targets for change for the radiologist. Initial changes were introduced in 12/2023. The Deming-Shewart PDSA (plan-do-study-act) cycle was applied to evaluate changes until the target was reached consistently.

## Results:

Radiologist: **not aware, forgot or does not know** LungRADS (non-body radiologists or part-time radiologists give LungRADS less freq; confusing communication → DHS does not have a "formal" LCS program, but CA state requires hospitals to offer LCS to eligible pts; not clear to use or not use LungRADS; other uses of LDCT – pneumoconiosis, Fleischner; different dictation template picked).



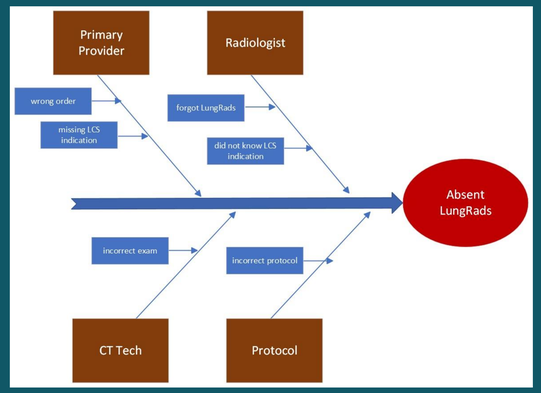




*Figure 1 – see above.* Process Map with Processes/Leaders: clinicians ordering, protocoling (radiologists), performing (CT techs), reporting (radiologists).

*Figure 2 on the left.* Root Cause Analysis with Fishbone diagram, Root Cause Analysis: list of agents and major reasons for error.

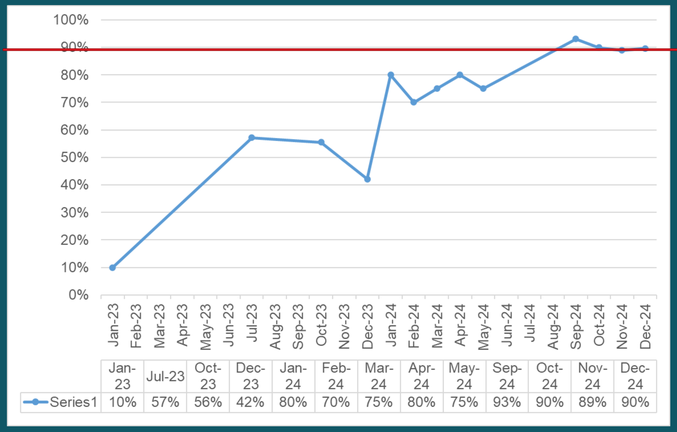
*Table 1– see below .* Root causes with appropriate countermeasures and outcomes, List of major root causes of lack of LungRADS reporting and appropriate countermeasures.

| Root Cause | Countermeasure | Responsible Person | Date Due | Outcome |
|---|---|---|---|---|
| Rad – Aware | Reminder at each radiology meeting | MD | 2024-01-01 | Improvement, continue |
| Rad – Forgot | LDCT LCS Dictation template requires LungRads | SMP | 2024-04-01 | Improvement, continue |
| Rad – Know | LDCT LCS Training/Talk | KV | 2024-04-02 | Improvement, continue |
| Rad – Remind | Message individuals still not reporting | KV | 2024-05-01 | Improvement, continue |
| Clin – "LCS" missing in order | ORCHID Order to require "LCS" | DHS / IT | 2024-03-15 | To be evaluated by DHS |
| Clin – Incorrect order placed | DHS Expected Practice | DHS / IT | 2024-03-15 | To be evaluated by DHS |

Ordering Clinician: "LCS" indication not provided; indication not clear (eg "follow-up nodule"); incorrect order (eg 10/12/2023 thoracic aneurysm screening).

Other Issues: CT Tech, Protocol, IT.

1. Radiology Conference – Radiologists were reminded at all meetings that LungRADS should be given for all LCS LDCT reports. Results improved from variable low rates to ~50%.
2. LungRADS template and lecture – LungRADS dictation template was created which does not let radiologists sign a report until LungRADS is specified; a departmental grand rounds lecture was delivered to educate team. Results improved to ~80%.
3. Personal reminders – LungRADS compliance reached target to ~90%.




| | Jan-23 | Jul-23 | Oct-23 | Dec-23 | Jan-24 | Feb-24 | Mar-24 | Apr-24 | May-24 | Sep-24 | Oct-24 | Nov-24 | Dec-24 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Series1 | 10% | 57% | 56% | 42% | 80% | 70% | 75% | 80% | 75% | 93% | 90% | 89% | 90% |

*Figure 3 on the left.* Timeline of improvement, red line indicate the target of 90% correct LDCT reports with LungRADS category.

## Conclusions

Persistent overall improvement was achieved during the QI process, although individual variations were observed. The current simple QI project demonstrates how the appropriate use of technology and simple interventions can improve clinical practice, and eventually patient care.

## References

1. Kramer BS *et al*. Lung cancer screening with low-dose helical CT: results from the National Lung Screening Trial (NLST). J Med Screen. 2011;18(3):109-11.
2. Jonas DE *et al*. Screening for Lung Cancer With Low-Dose Computed Tomography: Updated Evidence Report and Systematic Review for the US Preventive Services Task Force. JAMA. 2021 Mar 9;325(10):971-987.
3. Wolf AMD et al. Screening for lung cancer: 2023 guideline update from the American Cancer Society. CA Cancer J Clin. 2024 Jan-Feb;74(1):50-81.
4. MacMahon H, *et al*. Guidelines for Management of Incidental Pulmonary Nodules Detected on CT Images: From the Fleischner Society 2017. Radiology. 2017 Jul;284(1):228-243.
5. Fazio JC, *et al*. A review of silicosis and other silica-related diseases in the engineered stone countertop processing industry. J Occup Med Toxicol. 2025 Mar 17;20(1):9.