Implementation of a Blood-Based Screening Test to Address Low-Dose Computed Tomography (LDCT) Adherence Barriers within an Integrated Healthcare Delivery System

Authors: Muhammad Anees[1] James C. Solava[2] Amy Crawford-Faucher[2] Sarah L. Moseley[3] Ali H. Zaidi[1]

[1]Allegheny Health Network Cancer Institute, Pittsburgh, PA, USA. [2]Allegheny Health Network Primary Care Institute, Pittsburgh, PA, USA. [3]DELFI Diagnostics Inc, Palo Alto, CA, USA

BACKGROUND

While low-dose computed tomography (LDCT) has proven efficacy in lung cancer early detection and mortality reduction[1,2,3], real-world implementation faces significant barriers, including patient compliance and workflow complexities that limit screening benefits[4,5].

To optimize lung cancer screening impact at the healthcare system level, we implemented DELFI FirstLook™ Lung (FLL)*[6] blood-based screening as an adjunct option to LDCT, fully embedded within our Electronic Health Record (EHR) system with payor reimbursement, to enhance access for those historically resistant to, or unengaged with, conventional LDCT programs.

METHOD

Beginning October 2024 - September 2025, we launched a systematic initiative offering DELFI's FirstLook Lung (FLL) blood test as an alternative pathway for USPSTF-eligible patients.

- Established partnerships with payors for reimbursement.
- Targeted patient outreach strategies including patient navigator support
- Full integration within EHR system
  - Implemented test ordering and decision-support tools
  - Automated patient eligibility prompts
  - Standardized documentation
- Enabled subsequent LDCT scheduling when appropriate

We assessed the efficiency and ease of integration of FLL over a 11.5 months period, measuring provider ordering behavior, turnaround times across screening pathways, linkage of patients to LDCT testing and tracked patient LDCT outcomes.

CONCLUSIONS

Our first 11.5-month experience demonstrates early indications that screening with the blood-based FLL test can:

1. Effectively complement traditional LDCT programs when properly integrated into existing care pathways.
2. Be adopted readily by healthcare providers with rapid scaling, overcoming internal barriers to screening efficiency.
3. Link patients that were previously unscreened to lung cancer screening pathways, representing a meaningful step toward population-level screening goals.

KEY SUCCESS FACTORS

- Full EHR integration
- Payor partnership for reimbursement
- Identification and addressing of care gaps in the LDCT screening process
- Education and onboarding of providers with SDM tools
- Improvements in lab collection pathways enabling efficiency similar to clinic blood draws.

Figure 1: Patient Testing Workflow

FLL = FirstLook Lung Test **LCS** = Lung Cancer Screening **LDCT** = Low-Dose Computed Tomography **OPA** = Order Panel Agreement **SDM** = Shared Decision Making **TAT** = Turnaround-time

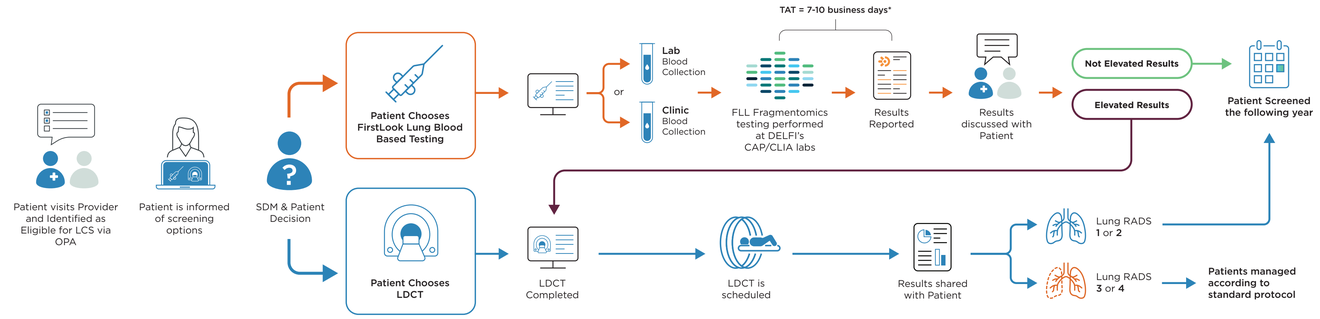
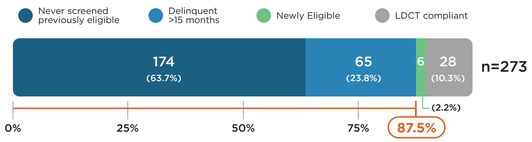


Table 1: Population Characteristics and Implementation Metrics (N=273 completed tests)

Patient Demographics	Value	Clinical Insight
Mean Age	60.37 ± 6.14 years	Typical screening population
Sex	42.0%	
FLL Results (273/404 patients completing testing [67.6% completion rate to end Sept. 2025])		
Elevated	120 (29.7%)	High-risk requiring LDCT
Not Elevated	153 (37.9%)	Lower risk
LDCT Follow-through		
Orders placed	112/120 (93.3%)	Excellent referral compliance
Imaging completed	71/120 (59%)	Opportunity for improvement

A TOTAL of 87.5% of patients tested with FLL blood test were either never screened or delinquent on screening for more than 15 months.

Figure 2: Previous LDCT Screening Status for Patients Tested with the FirstLook Lung Blood Test



63.5% of previously eligible patients had never been screened.

Mean time between FirstLook Lung testing and previous LDCT (n=93) 2.19 ± 1.83 years

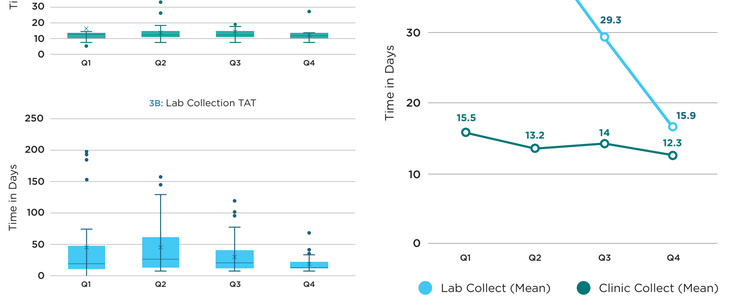
Feasibility of scale for implementation of a blood-based screening test for lung cancer screening:

1. Can be adopted readily by healthcare providers with rapid improvements in efficiency and scaling
2. Links patients that were previously unscreened to lung cancer screening pathways
3. Effectively complements LDCT with early indications of clinical utility

Next Steps: Further program refinements are needed to identify more eligible patients and address patient follow-through for imaging completions.

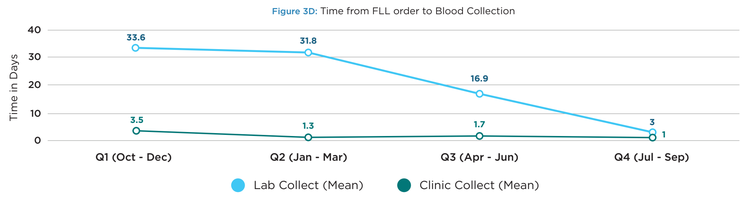
Rapid improvement in workflow efficiencies reduced blood collection times from lab settings. Significant operational improvements involved workflow optimization, with mean overall time from FLL test order to blood collection and reporting decreasing from 29.8 ± 45.1 days initially to 15.1 ± 6.8 days by quarter four—a 49.2% reduction. Clinic collections were initially superior to lab collections. Challenges for patients scheduling and blood collections from lab settings were overcome by quarter, enabling efficient blood draws with both modalities, substantially improving overall time from schedule to test result.

Figure 3: **TAT** = Time from FLL Test Ordering to blood draws and final report: Clinic vs Lab blood collections



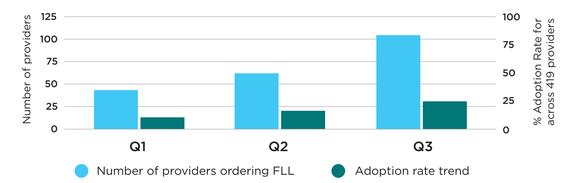
By Q4, the time for blood collection from FLL order to blood draw was a mean of 3 days for Lab and 1 day for clinic collections.

Figure 3D: Time from FLL order to Blood Collection



Consistent increase in adoption rates by providers with a strong ramping period across 3 quarters illustrate ease of scalability for testing. Onboarding and activation of providers ramped steadily over each quarter, illustrating ease of implementation and feasibility of scaling. A total of 419 providers will be activated to order FLL across the AHN system.

Figure 4: Provider adoption of FLL test ordering by Quarter



Implementation of FLL resulted in identification of delays in LDCT scheduling times. Systemic improvements each quarter, across the testing process, increased the overall efficiency of the LCS program

Figure 5A: LDCT Workflow Optimization

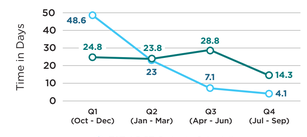


Figure 5B: FLL Implementation Efficiency Gains

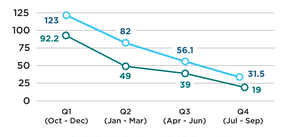
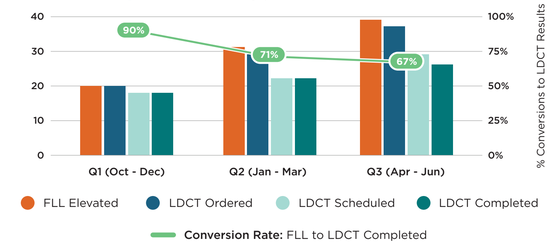
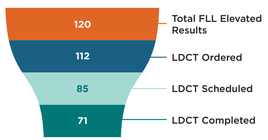


Figure 6: LDCT conversion by quarter for elevated FLL results



* Q4 data incomplete and continuing to mature through Q4/5.

Figure 7A: LDCT Screening Process Funnel



59.2% Overall completion rate

39 Patients lost to follow-up

93.3% Order Rate

Figure 7B: LDCT results provide early indication of clinical utility

LDCT Result	# pts	% of total
Pending	1	1.4%
Lung RADS-0	2	2.8%
Lung RADS-1	19	26.7%
Lung RADS-2	39	54.9%
Lung RADS-3	4	5.6%
Lung RADS-4A/B	6	8.5%
TOTAL LDCT results	71	

Of 71 LDCT results, ~14% (n=10) resulted in actionable findings. This is higher than would be expected from a normal LCS population (~4%)[7]. Those tested by FLL likely represent an enriched population for higher cancer risk with nearly ⅔ patients never previously screened and having elevated FLL results.

ACKNOWLEDGMENTS
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**DISCLAIMER*
"The FirstLook Lung test is a laboratory-developed test. This test was developed, and its performance characteristics were determined by DELFI Diagnostics. It has not been cleared or approved by the US Food and Drug Administration (FDA). The laboratory is regulated under the Clinical Laboratory Improvement Act (CLIA) as qualified to perform high-complexity clinical tests. The test is used for clinical purposes. It should not be regarded as investigational or for research."

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