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

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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.

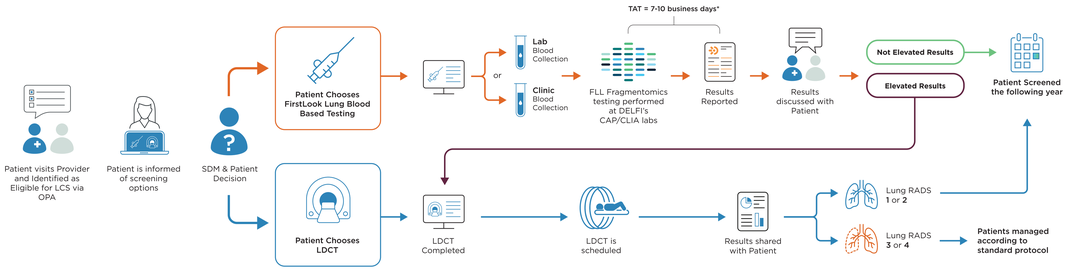
CLINICAL IMPLICATIONS

Early Indication that full integration of blood-based FirstLook Lung testing into clinical workflows with payor reimbursement can expand screening to those who resist or are unable to access traditional LDCT.

Our experience provides actionable insights for healthcare systems seeking to expand lung cancer screening access through this innovative blood-based methodology. Early data illustrates the feasibility of scaling such programs to serve hard to reach populations within health systems that can benefit from lung cancer screening.

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



RESULTS

Table 1:

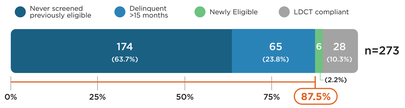
Population Characteristics and Implementation Metrics
(N=273 completed tests)

Patient Demographics	Value	Clinical Insight
Mean Age	60.37 ± 6.14 years	Typical screening population
Sex	Female 150 (54.95%) Male 123 (45.05%)	
Collection Site		
Lab Collection	165 (60.44%)	
Clinic Collection	108 (39.56%)	
FLL Results: 273/404 patients completing testing (67.6% completion rate through		
TOTAL FLL Orders	404 (100%)	FLL Orders placed by Providers
Report = Elevated	120 (29.7%)	High-risk requiring LDCT
Report = Not elevated	153 (37.9%)	Lower risk
Sent (collected, awaiting report)	20 (4.5%)	Test pending
Outstanding Orders	111 (27.48%)	Pending blood draw/unfulfilled
LDCT Follow-through		
Orders placed	112/120 (93.3%)	Excellent referral compliance
Imaging completed	71/120 (59%)	Opportunity for improvement

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

63.5% of previously eligible patients had never been screened.

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



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

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 3: Provider adoption of FLL test ordering by Quarter

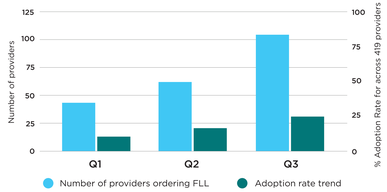
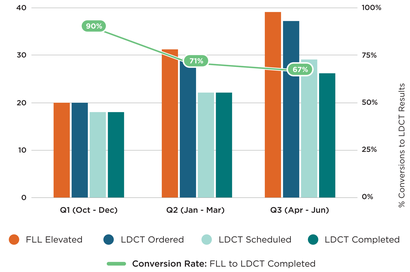


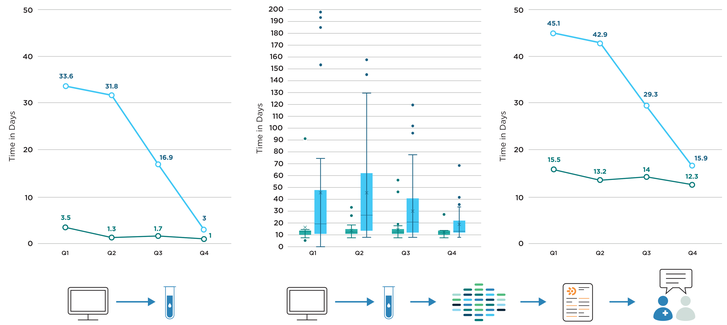
Figure 5: LDCT conversion by quarter for elevated FLL results



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

Rapid improvement in workflow efficiencies reduced blood collection times from lab settings. 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.

Improvements in Lab Blood Collection Efficiency by Quarter



4A: Time from FLL order to Blood Collection. Clinic vs Lab

4B: Time from FLL order to Blood Collection and Test Reporting. Clinic vs Lab

4C: Mean time from FLL order to Blood Collection and Test Reporting. Clinic vs Lab

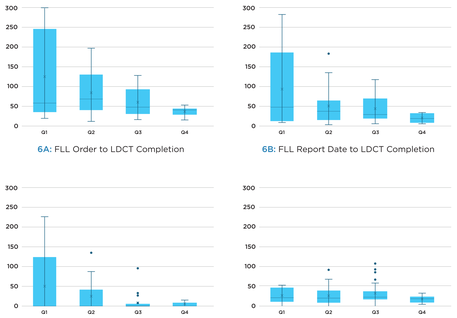
Feasibility of scale for implementation of a blood-based screening test for lung cancer screening:

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.

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 6: Workflow efficiency gains by quarter



6A: FLL Order to LDCT Completion

6B: FLL Report Date to LDCT Completion

6C: LDCT Order Date to LDCT Schedule Date

6D: LDCT Schedule Date to Completion

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

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
Contributions in data review and coordination by Kimberly Wertheimer, BSN, RN.

**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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