From Recalcitrance to Receptivity: Blood-Based Lung Cancer Screening and its Association with Uptake and Completion

#P296

Authors:
Muhammad Anees[1], Shurjeel Qazi[1], Lindsay Brandenstein[1], Juliette Och[1], Kirsten Morcheid[1], Brenna Offutt[1], Timothy J. Mickus[1], Raj Adhurty[1], Richard Medford[1], James A. Belter[1], James C. Solava[1], Tariq Cheema[1], David L. Bartlett[1], Sarah L. Moseley[1], Amy Crawford-Faucher[2], Ali H. Zaidi.[1]

Affiliations:
[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

RATIONALE:

Lung cancer screening (LCS) with low-dose CT (LDCT) reduces disease mortality,[1,2] but real-world implementation is limited by LDCT access and workflow impediments.[3] We integrated DELFI FirstLook Lung (FLL),[4*] a blood-based genomic lung screening test, into our electronic health record (EHR) and clinical workflow to improve LCS rates in our health system, focusing on patients who were behind on screening.

METHODS:

From Oct 2024 through Nov 2025 we offered FLL to USPSTF-eligible patients. EHR-based decision support identified eligible patients, prompted providers and included patient navigation. Our payor partner provided reimbursement for FLL (with potential co-pay).

Patient demographics were determined by EHR chart review. Analysis of socioeconomic status was performed by mapping patients zip codes to the CDC/ATSDR Social Vulnerability Index (SVI)[5] which assesses vulnerability across four domains that are relevant to lung cancer screening access: socioeconomic status; household characteristics; racial and ethnic minority status; housing type and transportation.

RESULTS

- Of the 2,532 patients eligible for LCS (1,331 of whom were LCS naïve), 1,228 (48.5%) were screened either with FLL (n=335) or primary LDCT (n=893) over the 14-month intervention, representing a approximately 2-fold increase compared to the prior year screening rate of 24.1%, and substantially exceeding the historical rate of increase of +3.4 pp per year.
- FLL testing reached a higher proportion of screening-naïve patients than did primary LDCT (63.9% vs. 31.5%, p<0.001). 90% of FLL-screened patients were overdue on their testing and/or annual repeat at the time of testing.
- When compared to patients who were offered primary LDCT screening, having the FLL blood test with a result of Elevated ("positive") was associated both with greater LDCT completion rates (73.6% vs. 58.6%, p<0.001) and more rapid follow through to LDCT completion both at beginning and end of period (51 down to 15 days and 95 down to 35 days, respectively).
- Suspicious findings on LDCT were more common following FLL Elevated results than primary LDCT (RADS-3: 7.6% vs. 6.6%; RADS-4 or higher: 10.4% vs. 6.1%).

REFERENCES:
1: "Reduced Lung-Cancer Mortality with Low-Dose Computed Tomographic Screening": The NLST Research Team. N Engl J Med 2011;365:395-409, VOL. 365 NO. 5
2: "Reduced Lung-Cancer Mortality with Volume CT Screening in a Randomized Trial": Harry J. de Koning, M.D et. al., N Engl J Med 2020;382:503-513, VOL. 382 NO. 6
3: "Understanding patient barriers and facilitators to uptake of lung screening using low dose computed tomography: a mixed methods scoping review of the current literature" Cavers et al; Respiratory Research volume 23: 374 (2022)
4: "Clinical Validation of a Cell-Free DNA Fragmentome Assay for Augmentation of Lung Cancer Early Detection", Mazzone et al Cancer Discov. 2024 Jun 6; 14(11):2224–2242.
5: Centers for Disease Control and Prevention/ Agency for Toxic Substances and Disease Registry/ Geospatial Research, Analysis, and Services Program. CDC/ATSDR Social Vulnerability Index 2022 Database United States. https://www.atsdr.cdc.gov/place-health/php/svi/index.html Accessed on April 29, 2026 https://www.atsdr.cdc.gov/placeandhealth/svi/data_documentation_download.html Accessed on April 29, 2026.

Figure 1:
Patient Testing Workflow

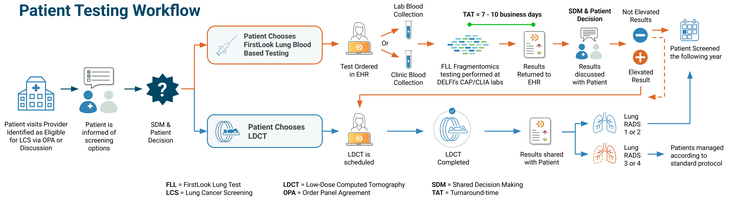
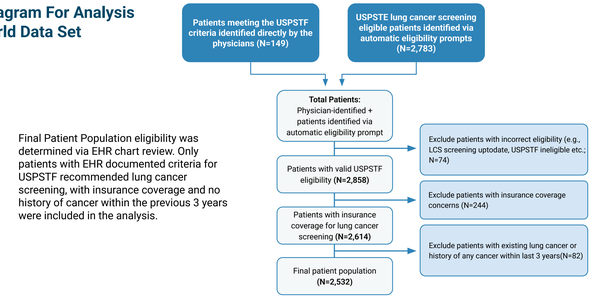


Figure 2:
Consort Diagram For Analysis of Real World Data Set



Final Patient Population eligibility was determined via EHR chart review. Only patients with EHR documented criteria for USPSTF recommended lung cancer screening, with insurance coverage and no history of cancer within the previous 3 years were included in the analysis.

Table 1:
Demographics Across the Eligible Population Within Insurance Coverage Plan Invited for Screening With Results

(from Oct 2024 through end Nov 2025; with complete demographic information in EHR)

	Overall (N=2532)	FLL (N=335)	LDCT Only (N=893)	No LCS (N=1304)	p value
Age	59.6 ± 5.0	60.4 ± 5.9	59.9 ± 4.7	59.2 ± 4.9	<0.001
Sex					
Male	1099 (43.4%)	157 (46.9%)	386 (43.2%)	556 (42.6%)	0.376
Female	1433 (56.6%)	178 (53.1%)	507 (56.8%)	748 (57.4%)	
Race					
White	2340 (92.4%)	321 (95.8%)	819 (91.7%)	1200 (92.0%)	0.069
Black	137 (5.4%)	13 (3.9%)	53 (5.9%)	71 (5.4%)	
Other/Declined	55 (2.2%)	1 (0.3%)	21 (2.4%)	33 (2.5%)	
Ethnicity					
Hispanic or Latino	17 (0.7%)	2 (0.6%)	2 (0.2%)	13 (1.0%)	0.870
Not Hispanic or Latino	2470 (97.6%)	326 (97.3%)	873 (97.8%)	1271 (97.5%)	
Declined	45 (1.8%)	7 (2.1%)	18 (2.0%)	20 (1.5%)	
Smoking Status					
Current	1348 (53.2%)	181 (54.0%)	412 (46.1%)	755 (57.9%)	<0.001
Former	1184 (46.8%)	154 (46.0%)	481 (53.9%)	549 (42.1%)	
Pack years	35.0 ± 15.9	35.5 ± 16.4	36.3 ± 16.4	34.0 ± 15.3	0.003
Residence					
Rural	109 (4.3%)	20 (6.0%)	47 (5.3%)	42 (3.2%)	0.021
Suburban	92 (3.6%)	12 (3.6%)	24 (2.7%)	56 (4.3%)	
Urban	2330 (92.1%)	303 (90.5%)	822 (92.1%)	1205 (92.5%)	

Figure 3:
Patients Were Predominantly Urban, With Rural Location Favoring Patients Choosing Blood-based Screening

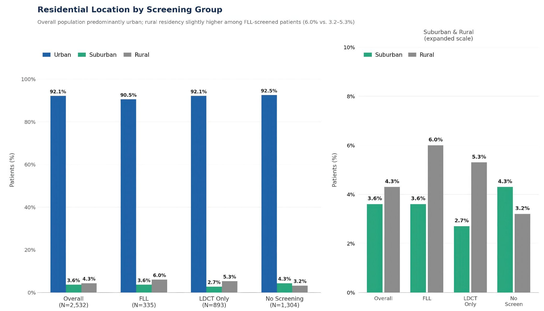
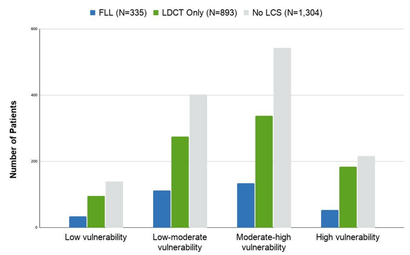


Figure 4:
Screening Modality by Social Vulnerability Index Quartile

Patients Choosing Blood-Based Screening Were from a Broad Spectrum of Community Social Deprivation from Low to High-Vulnerability.



Screening Population represents broad range of SVI quartiles.

No statistical difference between groups p = 0.207 suggesting FLL reached patients that were behind on screening across all areas of community social vulnerability, particularly from Low-moderate to High.

Figure 5:
Relationship between Patient Lung Cancer Screening History and Testing During Program Year

No LCS: Patients identified for screening that did not get screened during the program year.
LDCT Only: Patients identified for screening that received usual LDCT screening
FLL: Patients identified for screening that chose to take the blood-based test

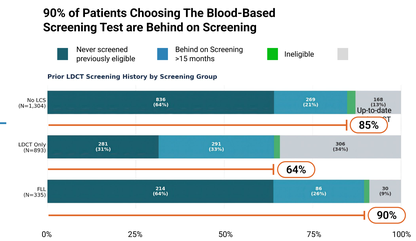
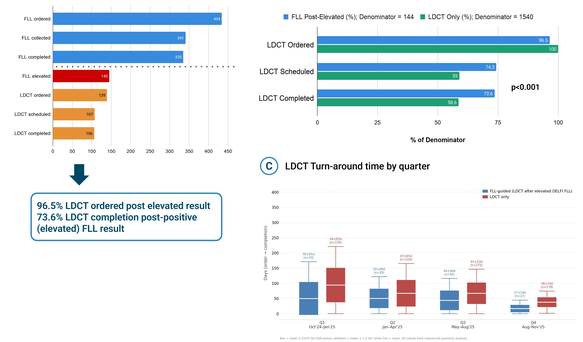


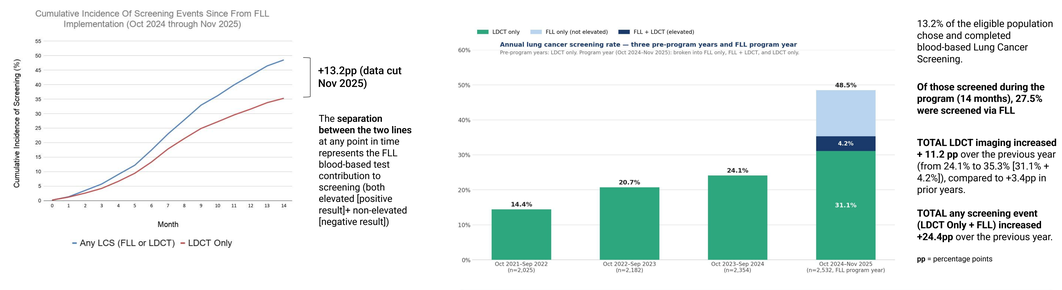
Figure 6:
Patients Screened by FLL had Greater LDCT Completion Rates, more Rapid Time to Imaging Completion and were associated with more Suspicious LDCT Findings than LDCT Only



LDCT completion rates (A,B), and time to completion (C) for post-positive FLL results versus LDCT-Only.
Compared to patients who were offered primary LDCT screening, FLL blood test results of Elevated ("positive") was associated with greater LDCT completion rates (75.4% vs. 57.2%, p<0.001) and faster turnaround time (C).

Figure 7:
Impact of Implementation of a Blood-Based Lung Cancer Screening Program on Real-World Lung Cancer Screening Rates.

Screening Rates are Assessed in the Same Population Across 4 Years (adjusted based on USPSTF eligibility by year)



13.2% of the eligible population chose and completed blood-based Lung Cancer Screening.

Of those screened during the program (14 months), 27.5% were screened via FLL

TOTAL LDCT imaging increased +11.2 pp over the previous year (from 24.1% to 35.3% [31.1% + 4.2%]), compared to +3.4pp in prior years.

TOTAL any screening event (LDCT Only + FLL) increased +24.4pp over the previous year.

pp = percentage points

More than 1 in 4 patients screened for lung cancer chose blood-based screening.

Key Findings Real World Evidence 14 Months Implementation Data for Patient Eligible for the Payor Coverage

Any Lung Cancer Screening	LDCT Screening	Follow-through post Positive	L-RADS 3 and Higher Detected
2X	**1.46X**	Post-positive result LDCT follow-up **73.6%**	Blood-Based Test followed by LDCT **18.0%**
Screening Rate Increase over previous year	LDCT Rate Increase over previous year	Post-negative result LDCT follow-up **5.0%**	LDCT Only **12.6%**
Any LCS: 48.5% vs. 24.1% (previous year)	**LDCT:** 35.3% vs. 24.1% (previous year)		

CONCLUSIONS

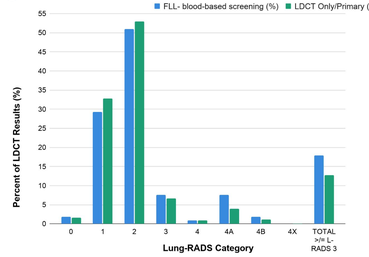
1: Implementation of FLL ordering as an option for LCS led to overall increases in screening through both blood and primary LDCT.

2: The program improved uptake particularly among those who were screening naïve or behind on annual LCS, suggesting blood-based testing was expanding the population being screened rather than displacing individuals otherwise adhering to LDCT.

3: The blood-based test was associated with higher and more rapid rates of follow-through testing than LDCT-Only.

Given the slow adoption of LDCT screening in the USPSTF eligible population, this point of care blood-based screening test has the potential to improve uptake and therefore lower lung cancer mortality through higher rates of early detection.

Figure D:



Elevated FirstLook Lung results are associated with higher likelihood of cancer in this population compared to those choosing LDCT only. Percentages are of completed LDCT scans. FLL denominator = 106 (LDCT after elevated DELFI FLL). LDCT-only dominator = 893. Total ≥ L-RADS 3 = sum of RADS 3 + 4 + 4A + 4B + 4X: FLL 20/106 (18.9%), LDCT only 113/893 (12.7%).