



NATIONAL  
LUNG CANCER  
ROUNDTABLE



# ACCELERATING UPTAKE of Lung Cancer Screening

*By Harnessing IT and Electronic Health Records*

## Executive Summary

*ACS NLCRT Workshop*

October 2, 2023  
Loews Chicago O'Hare  
Chicago, Illinois

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## Introduction

The *American Cancer Society National Lung Cancer Roundtable (ACS NLCRT)* held the **Accelerating Uptake of Lung Cancer Screening by Harnessing IT and Electronic Health Records** workshop on October 4, 2023, in Chicago, Illinois to address the #1 ranked priority tactic from the July 2022 summit, *Accelerating Uptake of Lung Cancer Screening – A National Initiative*.

This one-day workshop brought together lung cancer advocates, clinicians, researchers, and information technology (IT) and electronic health record (EHR) partners to focus on the roles of IT and EHR systems in lung cancer screening to accelerate uptake, including identifying eligible individuals, patient tracking for follow up of abnormal screening test results and adherence to annual screening, patient education including shared decision making, quality, and patient outcomes.

The day consisted of seven sessions, beginning with level-setting presentations from experts and presentations by nine IT and EHR vendors, followed by two rounds of breakout discussion sessions to discuss and prioritize tactics. The culminating activity of the workshop prioritized the top tactics identified during the breakout group discussions.

**Session 1** - *Welcome and Overview.*

**Session 2** - *Level-Setting Presentations.*

**Session 3** - *Breakout Session #1 - Review Strategies and Brainstorm Tactics.*

**Session 4** - *Breakout Session #1 - Report-Outs.*

**Session 5** - *Breakout Session #2 - Refining Tactics & Assessing Feasibility.*

**Session 6** - *Breakout Session #2 - Report-Outs and Voting.*

**Session 7** - *Next Steps and Closing.*

This document provides an overview of the workshop and presentations, including links to videos of the presentation slides and audio tracks.



## Overview - Level-Setting Presentations

**Dr. Ella Kazerooni**, a cardiothoracic radiologist and chair of the ACS National Lung Cancer Roundtable, opened the Level-Setting Presentation. The goal of the session was to establish a common understanding and knowledge base among the workshop participants, who came with different backgrounds in informational technology (IT), the electronic health record (EHR) industry, and healthcare system experience. The workshop addressed the IT and EHR system barriers that healthcare professionals experience when trying to increase the uptake of lung cancer screening (LCS). The workshop focused on accelerating LCS uptake while maintaining stringent standards of quality and safety.

**Dr. Carey Thomson**, a pulmonary medicine physician and chair of the ACS NLCRT Lung Cancer Early Detection Implementation Strategies Task Group, spoke about an ***End-to-End Lung Cancer Screening Process Map***. She highlighted that EHR, IT, and artificial intelligence (AI) systems provide important support for seven steps in the LCS process and are crucial for connecting eight types of healthcare professionals across the LCS continuum. She emphasized that only a minority of lung cancer cases are detected by screening and that most cases are found incidentally or in patients with symptoms. She described *LungPLAN*, a tool for modeling lung cancer programs, and reviewed the barriers and challenges that were identified in the 2022 ACS NLCRT Accelerating Lung Cancer Screening Summit.

**Dr. Kensaku Kawamoto**, who has many roles in health care IT including as Associate Chief Medical Information Officer at the University of Utah and member of the U.S. Health IT Advisory Committee (HITAC), which provides guidance to the U.S. Office of the National Coordinator for Health IT, discussed ***The Intersection of IT, Lung Cancer Screening Programs, Primary Care, and Patients***. He discussed a study on a new EHR tool that supported shared decision-making with clinician-facing prompts. The study integrated the tool into primary-care workflows to help identify patients eligible for screening and make the shared decision-making process faster and easier. The results of the study showed that the tool helped to increase low-dose computed tomography (LDCT) screening orders from 7% to 27% among 1,400 patients in the study. The tool was used about 25% of the time before initiating LDCT scans. Lastly, he emphasized that adding even a few minutes to the workflow of busy primary care providers can be excessive when working with patients who have many health conditions.

**Dr. Neville Irani**, a radiologist and founder at the Healthcare Quality Improvement Platform (HQIP), described ***EHR/IT Lessons Learned from the American College of Radiology (ACR) Lung Cancer Screening Learning Collaborative***, which he leads. He discussed the efforts of the ACR to implement a tool called the *Healthcare Quality Improvement Platform* in rural communities of Nebraska, where many high-risk people live with limited access to LCS. The uptake of screening

quadrupled from January 2020 to August 2023 because of the new tool. He highlighted the importance of collaboration in learning networks and implementing enhancements in an iterative process, and concluded his presentation by highlighting how patient empowerment is crucial in LCS, as shown by patient-focused initiatives such as the *Saved by the Scan* campaign.

**Dr. Peter Mazzone**, a pulmonary medicine physician and Member of the ACS NLCRT Steering Committee and Director of the Cleveland Clinic’s Lung Cancer Screening Program, spoke on ***Lung Cancer Screening Quality Indicators (Process): Development, Implementation, and IT/EHR Tools***. The ACS NLCRT Lung Cancer Early Detection Implementation Strategies Task Group developed and published a set of quality indicators to assess the quality of care.<sup>1</sup> The indicators measured practice performance elements that are linked to evidence or consensus and that are connected to health outcomes. He stated that good indicators should be feasible, measurable, and relevant so that they can be used to demonstrate the potential for improvements in quality care, and detailed six crucial quality indicators, from identifying eligible patients for screening to monitoring the time from nodule identification to lung cancer diagnosis. He concluded by providing a comprehensive roadmap for implementing IT and EHR tools to enhance quality care at every step of the LCS process.

**Dr. Christopher Slatore**, a pulmonary medicine physician and Director of the Lung Precision Oncology Program for the Veterans Health Administration and member of the ACS NLCRT Lung Cancer Early Detection Implementation Strategies Task Group, discussed ***Clinical Outcome Metrics in the Department of Veterans Affairs***. He opened by identifying the challenge of low adherence rates and emphasized that the quality of a screening program relies on patient follow-up after initial scans. Next, he described a new suite of EHR-embedded clinical decision support tools that identify and track veterans who are eligible for or engaged in LCS. So far, the VA has conducted more than 570,000 LCS scans, and the focus is on improving the quality measures of the LCS program. He stated that “acceptable” adherence rates with the new platform are 80% for LungRADS 1 or 2 findings and 60% across all LungRADS scores. Although these numbers are more than double the size of the numbers that were previously published for other programs, the VA is striving to achieve 90% adherence rates.

<sup>1</sup> Mazzone PJ, White CS, Kazerooni EA, Smith RA, Thomson CC. Proposed Quality Metrics for Lung Cancer Screening Programs: A National Lung Cancer Roundtable Project. *Chest*. 2021;160(1):368-378. doi:[10.1016/j.chest.2021.01.063](https://doi.org/10.1016/j.chest.2021.01.063)

## Overview - Breakout Group Discussions

Workshop participants were organized into four groups that each worked on one strategy for their two breakout sessions. The four strategies for the breakout groups are listed below:

- Identifying Individuals Eligible for Lung Cancer Screening
- Patient Tracking After Lung Cancer Screening
- Education for Patients Including Shared Decision Making
- Key Performance Indicators and Quality Measure Dashboard

**In the first breakout session**, subject matter experts reviewed the barriers and strategies from the July 2022 summit and led participants in the creation of actionable tactics. A good tactic is short-term, time-bound, actionable, detailed, present-focused, tied to a strategy, and a part of a larger plan. The top eight to ten tactics from each group were shared during the report-out session.

**In the second breakout session**, participants assessed the feasibility and impact of their tactics. Each group listed on a flip chart their tactics from their first breakout group session. Each participant was then asked to vote on their top three choices. Subject matter experts shared the top three to five tactics of each breakout group during the report-out in the general session.

To close the workshop, participants in the general session used Slido to rank all 15 tactics that were identified in the breakout group discussions. The rankings were displayed in real-time on the presentation screen and are listed on the next page.

## Final Tactic Rankings by Workshop Participants

 Use EHR patient portals to educate patients about LCS that is both standardized and targeted and allows them to provide smoking histories that populate the EHR directly.	7.3
 Develop a National Lung Cancer Screening EHR Module that includes standardized definitions for key metrics and thresholds representing high-quality performance.	7
 Incorporate unstructured data from EHR with natural language processing (NLP) to improve structured field data capture.	6.1
 Establish a centralized program with IT and navigation to track patients and findings from the point of entry into the LCS program.	5.6
 Partner with at least two major EHR vendors to agree to make the data needed for risk stratification and personalized/customized/segmented LCS education available through standard data interface (HC7 FHIR).	5.5
 Standardize and simplify smoking history using discrete fields to allow auto-population to/from social history with the goal of increasing visibility of eligibility status.	5.3
 Utilize the ordering of other screening exams as an opportunity to prompt providers to consider ordering LCS via health maintenance activity (e.g., at the time of ordering a mammogram).	5.1
 Remove the pre-authorization requirement for annual LCS exams.	3.9
 Provide LCS participants with a patient-focused engagement report of all of their specific findings.	3.7
 Encourage patients and providers to improve LCS data quality through a combination of education and incentive programs.	3.3
 Establish a radiology-based follow-up order for nodule findings.	2.8
 Have the EHR utilize information (e.g., interim CT scans of the chest and new lung cancer diagnosis) to adjust the due date for LCS.	2.7
 Embed decision aids in EHR that are personalized/customized to patient needs (patient-centric, culturally relevant, etc.).	2.5
 Include follow-up orders for all potential LDCT findings (episode of care).	2.3
 Build a grassroots coalition to curate highly tailored content that EHRs can deliver in trustworthy channels.	1.7

## Strategy 1 – Identifying Individuals Eligible for Lung Cancer Screening

Subject Matter Experts	
Greta Branford, MD University of Michigan	Nichole Tanner, MD, MSCR, FCCP Medical University of South Carolina
Barriers and Challenges	
<ul style="list-style-type: none"> <li>Educate providers on what resources are available</li> <li>Need positive education</li> <li>Digital literacy and utilization of patient portals</li> <li>Other ways to push education through the EHR system</li> <li>Does the patient know who to ask?</li> <li>Stigma and nihilism</li> </ul>	
Initial Tactics	Refined Tactics
<p>Strategy: Leverage the EHR to engage and educate patients about LCS and collect appropriate tobacco use</p> <ul style="list-style-type: none"> <li>User design - make the EHR patient portal more user-friendly</li> <li>Use quality prompts for things that matter.</li> <li>Utilize patient-facing portal questionnaires to validate by healthcare staff and populates EHR fields, including the problem list</li> <li>Use the EHR portal to educate patients about LCS (advertisement that is targeted)</li> </ul> <p>Other tactics:</p> <ul style="list-style-type: none"> <li>Expand smoking history reporting beyond primary care</li> <li>Incorporate unstructured data from EHR with NLP to improve structured fields</li> <li>Standardize the EHR interface to improve structured field reporting for tobacco use</li> <li>Standardize the estimates of LCS needs</li> </ul>	<ul style="list-style-type: none"> <li>Use the EHR patient portal to educate patients about LCS that is both standardized and targeted and allows them to provide a smoking history that populates the EHR directly</li> <li>Incorporate unstructured data from EHR with NLP to improve structured field data capture</li> <li>Have the EHR utilize information (e.g., interim CT scans of the chest and new lung cancer diagnosis) to adjust the due date for screening</li> <li>Use the ordering of other screening exams as an opportunity to prompt providers to consider ordering LCS via health maintenance activity (e.g., at the time of ordering a mammogram)</li> </ul>



<ul style="list-style-type: none"> <li>• Use algorithms to review the EHR records for potentially eligible patients</li> <li>• Use the EHR to prioritize patients for providers and generate a dashboard or list of patients</li> <li>• Use messaging services in the EHR so that patients know they are eligible and can take LCS into their own hands</li> </ul>	
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## Strategy 2 – Patient Tracking After Screening

Subject Matter Experts	
Debra Dyer, MD, FACP National Jewish Health	Christopher Slatore, MD, MS Portland VA Medical Center Oregon Health and Sciences University
Barriers and Challenges	
<ul style="list-style-type: none"> <li>• Systems             <ul style="list-style-type: none"> <li>○ Not sharing data</li> <li>○ No US healthcare system</li> <li>○ Money</li> <li>○ Navigation resources</li> <li>○ Orders to do something next</li> </ul> </li> <li>• Patients             <ul style="list-style-type: none"> <li>○ Trust</li> <li>○ Communication</li> <li>○ Money</li> </ul> </li> <li>• Providers             <ul style="list-style-type: none"> <li>○ Who gets ownership?</li> <li>○ Clinical follow-up</li> <li>○ Resources</li> </ul> </li> </ul>	
Initial Tactics	Refined Tactics
<ul style="list-style-type: none"> <li>• Dedicated order for LCS flu – interfacility             <ul style="list-style-type: none"> <li>○ Automated order entry process</li> </ul> </li> <li>• Closed loop validation</li> </ul>	<ul style="list-style-type: none"> <li>• Establish a centralized program with IT and navigation to track patients and findings from the point of entry into the LCS program</li> </ul>

<ul style="list-style-type: none"> <li>• Centralized LCS program (people, process, tech)             <ul style="list-style-type: none"> <li>○ Own everything</li> </ul> </li> <li>• Patient request for LDCT for LCS follow-up</li> <li>• Patient education/engagement             <ul style="list-style-type: none"> <li>○ Direct-to-public ads</li> </ul> </li> <li>• Health information exchange</li> <li>• Established referral network</li> </ul>	<ul style="list-style-type: none"> <li>• Remove the pre-authorization requirement for an annual LCS exam</li> <li>• Include follow-up orders for all potential LDCT findings (episode of care)</li> <li>• Establish a radiology-based follow-up order for nodule findings</li> <li>• Provide LCS participants with a patient-focused engagement report of all their specific findings</li> </ul>
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## Strategy 3 – Education for Patients Including Shared Decision-Making

Subject Matter Experts	
Tanner Caverly, MD, MPH University of Michigan	Joelle Fathi, DNP, RN, ARNP, CTTS, FAAN GO2 for Lung Cancer
Barriers and Challenges	
<ul style="list-style-type: none"> <li>• Lack of personalization in patient communication</li> <li>• Activating and incentivizing patients to get screened</li> <li>• Lack of information about other risk factors for further segmentation and tailoring</li> <li>• Lack of awareness around policies that have to do with screening and coverage</li> <li>• Funding for tailored messaging and outreach</li> </ul>	
Initial Tactics	Refined Tactics
<ul style="list-style-type: none"> <li>• Create a standardized dissemination plan for educational materials in all modalities, including national patient education initiative that considers the regional, cultural, and linguistic needs of diverse communities             <ul style="list-style-type: none"> <li>○ TV, banner ads, radio, representatives in a community, healthcare providers, tearaways)</li> <li>○ Find a sustainable method for funding standardized dissemination plans</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Build a grassroots coalition to curate highly tailored content that EHRs can deliver in trustworthy channels</li> <li>• Embed personal/customized to patient needs (patient-centric, culturally relevant, etc.) decision aides in the EHR</li> <li>• Get at least two major EHR vendors to agree to make the data needed for risk stratification and personalized, customized, segmented LCS education available through a standard data interface (HL7 FHIR)</li> </ul>

- Creating tailored messaging – initiatives that help create universal language to create awareness
  - Right message, right time
  - Celebrity endorsement
  - Identification of the messenger for specific populations (e.g., messaging coming from the pulpit in Black/Indigenous/People of Color (BIPOC) communities)
  - Personalized patient experience to understand the screening process
- Create policies that would drive linkages between screening coverage and awareness about environmental and occupational risk.
  - Create awareness around any policies that have to do with screening and coverage, including expansion of services
- Get data needed for identifying risk and eligibility in federal regulations.
  - Engage EHR vendors to pilot data-sharing around LCS eligibility
- Use better algorithms to help physicians identify screening eligibility
  - Generate probability without discrete data.
  - Leverage AI to assess patient risk for LC and provide direct education to the patient.
  - Provide personalized direct education to patient about their risk
- Leveraging the patient portal for dissemination of patient education.

<ul style="list-style-type: none"> <li>○ After an order is placed for a CT screen, deliver an after-visit video to patients about the next steps</li> <li>○ Leverage patient navigators to support this</li> </ul>	
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## Strategy 4 – Performance Indicators and Quality Measure Dashboard

Subject Matter Experts	
Peter Mazzone, MD, MPH, FCCP Cleveland Clinic	Neville Irani, MD University of Kansas Cancer Center
Barriers and Challenges	
<ul style="list-style-type: none"> <li>● Smoking history simplification</li> <li>● Vendors getting the data from the EHR (structured and unstructured discrete fields)</li> <li>● Lung cancer screening data not collected in uniform ways nationally (Different EHRs)</li> <li>● Complex history of smoking exposure</li> <li>● Standardized window of adherence</li> <li>● National metrics for detailed screening outcomes are not defined</li> <li>● Lack of resources for data analysis process changes</li> <li>● Lack of discrete data in the EHR (LungRADS) limits outcome analysis</li> <li>● Lack of visibility for existing data</li> <li>● Baseline follow-up for Lung RADS 3, 4A, and 4B</li> <li>● Import Lung RADS in a searchable format</li> <li>● Lung RADS not discrete in the EMR</li> <li>● Stage of cancer, percentage of surgery</li> <li>● Inaccurate data in the system</li> </ul>	
Initial Tactics	Refined Tactics
<ul style="list-style-type: none"> <li>● Minimal data elements for an LCS module               <ul style="list-style-type: none"> <li>○ Patient age</li> <li>○ Date of their last exam</li> <li>○ What their last result was</li> </ul> </li> <li>● Build consensus among organizations</li> <li>● Map out eligible screening populations</li> </ul>	<ul style="list-style-type: none"> <li>● Develop a National Lung Cancer Screening EHR Module that includes standardized definitions for key metrics and thresholds representing high-quality performance</li> <li>● Encourage patients and providers to improve lung cancer screening data</li> </ul>

	<p>quality through a combination of education and incentive programs</p> <ul style="list-style-type: none"><li>• Standardize and simplify smoking history using discrete fields to allow auto-population to/from social history with the goal of increasing the visibility of eligibility status</li></ul>
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## Overview - Video Links to Presentations

<b><i>Welcome and Overview</i></b>
<p><b><u><a href="#">Welcome and Overview</a></u></b>  Ella A. Kazerooni, MD, MS, FACR, FACC, FSABI, Chair, NLCRT, University of Michigan</p>
<b><i>Level-Setting Presentations</i></b>
<p><b>Moderator:</b> Ella A. Kazerooni, MD, MS, FACR, FACC, FSABI, Chair NLCRT, University of Michigan</p> <p><b><u><a href="#">End-to-End Lung Cancer Screening Process Map</a></u></b>  Carey C. Thomson, MD, MPH, FCCP, Mount Auburn Hospital/Beth Israel Lahey Health, Harvard Medical School</p> <p><b><u><a href="#">EHR/IT Lessons Learned from the ACR Lung Cancer Screening Learning Collaborative</a></u></b>  Neville Irani, MD, University of Kansas Cancer Center</p> <p><b><u><a href="#">Intersection of IT, Lung Cancer Screening Programs, Primary Care, and Patients</a></u></b>  Kensaku Kawamoto, MD, PhD, MHS, FACMI, FAMIA, University of Utah</p> <p><b><u><a href="#">Operational Quality Metrics</a></u></b>  Peter J. Mazzone, MD, MPH, FCCP, Cleveland Clinic</p> <p><b><u><a href="#">Clinical Outcome Metrics</a></u></b>  Christopher Slatore, MD, MS, Portland VA Medical Center/Oregon Health and Sciences University</p>
<b><i>Report-Outs from Breakout #1</i></b>
<p><b>Moderator:</b> Debra S. Dyer, MD, FACR, National Jewish Health</p> <p><b><u><a href="#">Identifying Individuals Eligible for Lung Cancer Screening</a></u></b>  Greta Branford, MD, University of Michigan</p> <p><b><u><a href="#">Patient Tracking After Lung Cancer Screening</a></u></b>  Christopher Slatore, MD, MS, Portland VA Medical Center/Oregon Health and Sciences University</p> <p><b><u><a href="#">Education for Patients, Including Shared Decision Making</a></u></b>  Joelle T. Fathi, DNP, RN, ARNP, CTTS, FAAN, GO2 for Lung Cancer</p> <p><b><u><a href="#">Key Performance Indicators and Quality Measure Dashboard</a></u></b>  Neville Irani, MD, University of Kansas Cancer Center</p>

### ***Report-Outs from Breakout #2 and Voting***

**Moderator:** Tanner Caverly, MD, MPH, University of Michigan

**Identifying Individuals Eligible for Lung Cancer Screening**

Greta Branford, MD, University of Michigan

**Patient Tracking After Lung Cancer Screening**

Debra S. Dyer, MD, FACR, National Jewish Health

**Education for Patients, Including Shared Decision Making**

Angela Criswell, GO2 for Lung Cancer

**Key Performance Indicators and Quality Measure Dashboard**

Neville Irani, MD, University of Kansas Cancer Center

### ***Next Steps and Closing***

**Next Steps and Closing**

Ella A. Kazerooni, MD, MS, FACR, FACC, FSAB, Chair, NLCRT, University of Michigan

## Details - Level-Setting Presentations

**Dr. Carey Thomson**, a pulmonary and critical care medicine physician at the Mount Auburn Hospital/Beth Israel Lahey Health, and Chair of the ACS NLCRT Lung Cancer Early Detection Implementation Strategies Task Group, was the first speaker in the session. She spoke about an ***End-to-End Lung Cancer Screening Process Map***. She highlighted that IT is important to support navigation through all the steps of LCS programs, which include 1) raising the awareness and education of the public and clinicians, 2) identifying eligible populations by documenting tobacco use and quit history), 3) implementing shared decision making, 4) performing a Low-Dose Computed Tomography (LDCT) scan, 5) communicating results to both participants and clinicians through a templated document, 6) creating work-ups for abnormal results, and 7) diagnosing lung cancer or other diseases.

She said that navigation and technology (IT, EHR, and artificial intelligence software) are crucial for connecting eight different types of healthcare professionals across the LCS continuum. Next, she delved into the critical need to embody the essential tenets of quality care set forth by the Institute of Medicine, which emphasized the ideals of providing safe, timely, effective, efficient, equitable, and patient-centric healthcare programs. In addition, there is a need for quality metrics to evaluate the programs.

Dr. Thomson called out the need to think about different solutions for centralized, decentralized, and hybrid programs. She mentioned the current limitations of LCS and emphasized that a minority of lung cancer cases are detected through screening. In contrast, a significant portion of cases are found incidentally or in patients with symptoms. This situation revealed a need for improved IT and navigation solutions to streamline the diagnostic process and reduce inefficiencies in patient care. Accordingly, she presented an example LCS program that combined LCS and the nodule pathway with navigation.

Next, she presented LungPLAN, which is a freely accessible tool that enables healthcare systems to predict and plan their infrastructure, IT requirements, and financial needs for LCS programs. She also described a NLCRT paper that looked at the integral role of EHR systems in reporting and tracking patients with LCS. The paper could help to guide IT developers to provide effective and convenient solutions.

Dr. Thomson called for more strategic outreach that would include tailored education for patients and providers and the leveraging of diverse solutions and EHR systems to promote LCS awareness. Finally, she presented the barriers and tactics that were identified in the 2022 *Accelerating LCS Summit*. That information could serve as a foundation for establishing nationwide agreement on fundamental IT and EHR components and standards for comprehensive program efficacy.

**Dr. Kensaku Kawamoto**, from the University of Utah spoke about ***The Intersection of IT, Lung Cancer Screening Programs, Primary Care, and Patients***. LCS with annual LDCT scans can reduce lung cancer deaths by about 20%. The US Preventive Services Task Force (USPSTF) has recommended offering screening to high-risk patients since 2013, but only 6.5% of eligible patients were screened in the United States in 2020. Some of the barriers experienced by providers of LCS include lack of familiarity with eligibility criteria and insurance coverage, the difficulty identifying eligible patients based on EHR records, the need for guidance on the management of screening results, skepticism about the benefits of screening, and insufficient time or knowledge to conduct shared decision making (SDM).

Dr. Kawamoto presented a study supported by the Agency for Healthcare Research and Quality entitled *Improving Lung Cancer Screening Through an EHR-Integrated Everyday Shared Decision-Making Tool and Clinician-Facing Prompts*. The objective of the study was to design, develop, and evaluate a widely scalable approach to enabling LCS by addressing key barriers to screening. The study integrated the tool with routine primary care workflows to help providers identify patients who were eligible for LCS and to make the provider-patient SDM sessions easier and faster (1-2 minutes). The authors developed a tool named Decision Precision+ (available for free at <https://screenlc.com>), and it facilitated the essential elements of SDM on one page and focused on timesaving features.



They integrated the SDM tool and several prompts for LCS within the EHR system, including a patient-specific note that met all CMS requirements for documentation before starting the screening process. The results of the study were based on more than 1400 patients and showed that LDCT ordering increased from 7% to 27% after using the tool. The increase in orders was also reflected in a rise in LDCT completion in both primary and pulmonary care settings. The SDM tool was used about 25% of the time before initiating LDCT scans. Dr. Kawamoto emphasized that even adding a few minutes to busy primary care provider workflows can be excessive when working with patients who have many health conditions. Finally, he offered collaboration support for integrating the tool into other EHR systems.

**Dr. Neville Irani**, from the University of Kansas, presented on **EHR/IT Lessons Learned from the ACR Lung Cancer Screening Learning Collaborative**. Lung cancer has the highest mortality rate among all cancers. Although early detection has the potential to improve outcomes, about 90% of individuals at risk remain unscreened. Dr. Irani discussed the efforts of the American College of Radiology to implement a tool called the Healthcare Quality Improvement Platform in rural communities of Nebraska, where many high-risk people live with limited access to LCS. The uptake of LCS quadrupled from January 2020 to August 2023 because of the new tool. He highlighted the importance of collaboration in learning networks and implementing enhancements in an iterative process.

The speaker named two main areas of focus: 1) identifying eligible patients and 2) implementing effective tracking systems to maintain consistent patient engagement. He emphasized the significance of patients identifying themselves as eligible for LCS to boost engagement and highlighted the ongoing efforts to develop specific tools for patient empowerment. In terms of follow-up, the collaborative examined various models and customized approaches based on each organization's context (decentralized, centralized, or hybrid). He concluded his presentation by highlighting how patient empowerment is crucial in LCS, as shown by patient-focused initiatives such as the Saved by the Scan campaign.

**Dr. Peter J. Mazzone**, a pulmonary medicine physician from the Cleveland Clinic, spoke about **Lung Cancer Screening Quality Indicators (Process): Development, Implementation, and IT/EHR Tools**. Dr. Mazzone began by emphasizing the importance of quality care, defining it as the degree to which health services align with current professional knowledge and enhance desired health outcomes. To assess care quality, the ACS NLCRT Implementation Task Force developed a set of quality indicators. The indicators measure practice performance elements that are linked to evidence or consensus and that are connected to health outcomes. He stated that good indicators should be feasible, measurable, and relevant so that they can be used to demonstrate the potential for improvements in quality care.

The process of developing these indicators involved careful planning and organizing a multidisciplinary team. For LCS, a careful approach was especially critical due to the persistent challenge of diagnosing lung cancer at localized stages. Dr. Mazzone highlighted the necessity of identifying high-risk groups efficiently, facilitating early cancer detection, ensuring clear communication and adherence, addressing scheduling issues, promoting equitable access to care, and managing nodule care.

He detailed six crucial quality indicators, from identifying eligible patients for screening to monitoring the time from nodule identification to lung cancer diagnosis. He underscored the potential for IT and EHR tools to not only aid in measuring quality indicators but also to facilitate performance improvement by connecting patients who currently smoke with smoking cessation programs, enhancing follow-up adherence through reminders, feeding data to coordinators for patient communication, and tracking diagnostic progress for efficient management. In closing, Dr. Mazzone provided a comprehensive roadmap for implementing and utilizing IT and EHR tools to enhance patient quality care in every step of the LCS process.

**Dr. Christopher G. Slatore**, a pulmonologist from the Oregon Health & Science University, gave the last presentation of the session. He spoke about **Clinical Outcome Metrics in the Department of Veterans Affairs**. He started by sharing the mission of the Veterans Affairs (VA) National Center for Lung Cancer Screening, which is to enhance systematic and equitable access to high-quality lung cancer screening. He identified the challenge of low adherence rates and emphasized that the quality of a screening program relies on patient follow-up after initial scans. The VA serves about nine million veterans and has been actively expanding its services.

The speaker explained that the VA initiated a pilot program for LCS involving a Lung Cancer Screening Platform. The tool is a suite of EHR-embedded clinical decision support tools that identify and track veterans who are eligible or engaged in lung cancer screening. Over 100 VA facilities have adopted this platform, and a directive requiring its implementation in all VA facilities will be issued soon. So far, more than 570,000 LCS scans have been conducted, but the focus is on improving the quality measures of the program.

Dr. Slatore introduced clinical outcome metrics and pointed out that the current number of people with LungRADS 2 findings is higher than that of 2022, suggesting that LCS efforts are identifying cases at earlier stages. He revealed that with the new platform, their “acceptable” adherence rates, involving a follow-up interval of one year, are 80% for LungRADS 1 or 2 findings and 60% across all LungRADS scores. Although these numbers are more than double the size of the numbers that were previously published for other programs, the VA is striving to achieve 90% adherence rates.

He shared the VA approach to measuring adherence, which is to focus on who is offered lung cancer screening, who accepts it, who shows up for scans, and who adheres to the follow-up guidelines. The VA also tracks the number of patients who accept smoking cessation resources.

Next, he discussed the challenges of identifying patients with cancer, emphasized the need for real-time data collection, and highlighted the role of EHR systems in improving the LCS process. Accordingly, the VA is developing metrics and data systems to monitor and improve procedures, and they aim to connect LCS with smoking cessation resources. Dr. Slatore concluded his presentation with a powerful patient testimonial to highlight that real-life stories can play a pivotal role in inspiring individuals to initiate and allocate resources for this endeavor.

## Details - Breakout Session 1– Strategies

**Dr. Nichole Tanner** presented the summary of the *Identifying Individuals Eligible for Lung Cancer Screening* breakout group. They emphasized the importance of simplifying the patient portal, especially for elderly individuals. They suggested improving the user-friendliness of portals and exploring alternatives such as text messaging. They recommended implementing quality prompts to remind patients about follow-up screenings. The group proposed several solutions involving patient-facing questionnaires to streamline the entry of smoking history into the EHR system, which in turn would facilitate the identification of eligible patients. They stressed the value of using the EHR system to engage and educate patients about LCS. Additionally, they discussed various other tactics, such as expanding the reporting of smoking history beyond primary care and incorporating unstructured EHR data using natural language processing (NLP) to improve structured fields. They discussed standardizing the EPIC interface to enhance the reporting of tobacco use information, developing standardized features to estimate the need for LCS, and exploring mechanisms to comb the EHR system to identify potentially eligible patients. Finally, they suggested using the EHR system to prioritize patients for providers by generating a dashboard or list and using messages to inform the patients about their eligibility for LCS, thereby empowering the patients to take proactive steps.

**Dr. Christopher Slatore** presented the summary of the *Patient Tracking After Screening* breakout group. The group proposed creating an ordering and screening process specifically designed for LCS. The process would facilitate coordination among healthcare facilities and ensure that patients with findings on CT scans were promptly scheduled for follow-up. The group recommended the establishment of a centralized lung cancer program that would clarify the roles of different specialists to address the issue of ownership and responsibility for findings and follow-up. The group also explored the idea of enabling patients to directly request LDCT scans for follow-up screenings to simplify the ordering process. They discussed techniques for educating and engaging patients and explored the possibility of using a health information exchange to fill the gaps in the healthcare system. An exchange would facilitate smooth transitions among healthcare providers and systems and ensure efficient patient tracking after screening.

**Dr. Joelle T. Fathi** presented the summary of the *Education for Patients Including Shared Decision-Making* breakout group. The main strategy of the group was to create a standardized dissemination plan for educational materials across various platforms. They proposed a national initiative for patient

education that considered the regional, cultural, and linguistic needs of diverse communities. They highlighted the importance of providing tailored messages at the right time in patient journeys. The group suggested identifying key messengers for specific populations, such as using the pulpit in Black, Indigenous, and People of Color (BIPOC) communities. They also discussed the need for policies to connect screening coverage with awareness of environmental and occupational risks. They recommended engaging EHR vendors to gather the data required for identifying LCS risk and eligibility in compliance with federal regulations. Ultimately, the group aimed to leverage artificial intelligence to assess patient risk and provide personalized education paths through patient portals to empower patients to take an active role in managing their health.

**Dr. Neville Irani** presented the summary of the **Key Performance Indicators and Quality Measure Dashboard** breakout group. They emphasized the importance of identifying essential data elements for evaluating program performance. They proposed three fundamental data elements: patient age, the date of the last exam, and the exam results. These simple yet crucial indicators can provide valuable insights into the performance of LCS programs. Moreover, the group recognized the need to collaborate and build consensus among organizations to streamline the implementation of effective key performance indicators and quality measures. Finally, they underscored the importance of utilizing smoking data to identify eligible populations. They emphasized that it is essential for healthcare providers to calculate the proportion of current smokers who meet LCS criteria when strategically establishing program performance indicators and quality measures.

## Details - Breakout Session 2 – Tactics

**Dr. Greta Branford** presented the summary of the tactics proposed by the **Identifying Individuals Eligible for Lung Cancer Screening** breakout group. The first tactic was to educate patients about LCS in a standardized and targeted way by providing data about their smoking history through the EMR patient portal. The second was to improve structured field data capture by using natural language processing methods to analyze and incorporate unstructured data from the EMR system. The third tactic was to use the EMR system to adapt and customize the LCS process, including adjusting the dates for screening and follow-up. The last tactic was to use the ordering of other screening exams, such as mammograms, as opportunities to prompt providers to consider ordering LCS.

**Dr. Debra S. Dyer** presented the summary of the tactics developed by the **Patient Tracking After Screening** breakout group. They focused on tracking both patients and nodules. The first recommendation was to establish a centralized program with IT and navigation to track patients and findings from the point of entry into the LCS program (either from external or internal shared decision-making referrals). Other suggestions included eliminating the pre-authorization mandate for the yearly LCS examination and incorporating follow-up orders for all potential LDCT findings. These improvements would ensure that follow-up procedures were covered without generating copayments for patients. The group also recommended a radiology-based follow-up order for nodule findings to help ensure that the

nodules were properly monitored and assessed. Finally, they recommended personalized health reports to enhance patient engagement and tracking by extracting relevant data from chest CT scans, even if the scans were unrelated to lung cancer.

**Angela Criswell** shared two strategies from the *Education for Patients Including Shared Decision-Making* breakout group. The first strategy was to create curated messages that would resonate with patients and would be delivered in trustworthy ways. They proposed the formation of diverse grassroots coalitions to create customized, patient-centered content that EHRs could deliver through reliable channels. Additionally, they suggested embedding personalized and culturally relevant decision aids within the EHR system. The second strategy focused on leveraging informatics to identify data elements required for personalized messaging and risk stratification. The group suggested getting data from at least two major EHR vendors, such as EPIC and Oracle-Cerner, for risk assessment and personalized LCS education via a standardized data interface, such as HL7 FHIR.

**Dr. Neville Irani** presented the summary of the *Key Performance Indicators and Quality Measure Dashboard* breakout group. The first recommendation was to define high-quality performance by developing a National Lung Cancer Screening EHR module of standardized definitions for key metrics and thresholds. The second recommendation was to encourage patients and providers to improve LCS data quality (mainly smoking history) through a combination of education and incentive programs. The third suggestion was to standardize and simplify the documentation of patient smoking histories by using discrete fields within the EMR system. This approach would allow for the automatic transfer of smoking history information between different sections of the system and would enhance the visibility of eligibility status for lung cancer screening. Additionally, standardized smoking histories could have a broader impact by helping to estimate the risk of other associated health conditions.

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