REWIND, REMIND Webinar Takeaways

The webinar ***Lung Cancer Screening Eligibility: Knowledge Update and Equity Impact*** aired on September 20, 2021. The webinar described how the eligibility for lung cancer screening was expanded through the new 2021 *United States Preventive Services Task Force* (USPSTF) recommendations. The webinar also described how the changes could impact health equity and identified opportunities for coalitions to increase awareness of lung cancer screening recommendations.

This document summarizes key takeaways and resources from the webinar at the following link: https://youtu.be/5kUu3JMUMBo.

The *American Cancer Society* **Comprehensive Cancer Control (ACS CCC)** team hosted the webinar. The ACS CCC team seeks to build the capacity of grant recipients in the *Centers for Disease Control and Prevention* **National Comprehensive Cancer Control Program** to implement policy, systems, and environmental change approaches and evidence-based promising practices in cancer prevention, screening, diagnostic follow-up, and survivorship.

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American Cancer Society® COMPREHENSIVE CANCER CONTROL

Lung Cancer Screening Eligibility Knowledge Update and Equity Impact

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The goals of the webinar were to:

- Describe how eligibility for lung cancer screening expanded through updates made by the *United States Preventive Services Task Force* (USPSTF) in 2021
- Explain how expanded eligibility for lung cancer screening could impact health equity in the United States
- Identify opportunities for coalitions to increase awareness of lung cancer screening recommendations

Where We Are – Barriers to Screening Adoption

The national average lung cancer screening rate for adults aged 55-80 years using low-dose computed tomography (LDCT) is low and is only about 5.0% of the eligible, at-risk population.

One main problem behind the low screening rate is that it is difficult to know who to screen. For example, various organizations have published considerably different eligibility criteria for lung cancer screening, and the differences contribute to the complexity of identifying eligible patients at the clinical level. Other barriers also impede lung cancer screening; several of them are listed below.

Misaligned screening criteria. The USPSTF criteria are not in alignment with the criteria used by the *Centers for Medicare & Medicaid* (CMS), the criteria used by the *National Comprehensive Cancer Network* (NCCN), or the criteria used by the *American Association for Thoracic Surgery* (AATS). In addition, commercial health insurers may also use their own screening criteria; these will eventually come into line with the USPSTF 2021 recommendation in accordance with the Affordable Care Act.

Identifying the at-risk cohort. Using complex criteria such as pack-years and quit dates makes it more difficult to identify people at risk for lung cancer than for breast, cervical, or colorectal screening, which for the most part use simple age ranges and/or gender to identify at-risk cohorts.

Shared decision-making. Shared decision-making can present a challenge to primary care because the explanations of risk criteria for patients are cumbersome, and the patient visit time is limited. In 2015, the CMS covered lung cancer screening for Medicare and Medicaid beneficiaries. But one of the requirements for payment was (and is) to document and conduct a shared decision-making visit that

includes the use of a decision aid tool. The problem was (and is) that there was no clarity around what accepted statistics and metrics should go into the shared decision-making conversation. The published numbers surrounding metrics such as cancer detection, false positive, and significant incidental finding rates can vary tremendously depending on local demographics, reporting systems, and the definitions used to derive those metrics.

Lung RAD-based subsequent scans and referrals. Primary care providers must be educated about taking appropriate actions based on the *American College of Radiology* (ACR) Lung RADs categories. One way to support primary care with this challenge is to recommend specialty consultation for patients with a Category 4 or suspicious finding, as is done in the *Lahey Lung Screening Program* (Lahey).

Absence of HEDIS Measures for Lung Cancer Screening. Primary care physicians are often evaluated by other Healthcare Effectiveness Data and Information Set **(**HEDIS) measures, so lung cancer screening activities may not be incentivized to occur during the limited patient visit time.

Eligibility Criteria for Lung Screening

Several large screening trials have been conducted to evaluate the mortality benefit of LDCT lung screening. These trials are instructive for identifying populations at risk for lung cancer.

The National Lung Screening Trial (NLST) was at the forefront of establishing screening programs by showing a 20% mortality benefit from using LDCT screening to detect early-stage lung cancer in at-risk patients. The NLST enrollment criteria are patients aged 55-74 with a 30+ pack-year history of smoking and who currently smoke or quit no longer than 15 years ago. The NLST eligibility criteria were used by the CMS and the USPSTF to establish policies in the United States, even though the demographic enrollment in the study was not reflective of the demographics of the U.S. population.

Many factors can increase the risk for lung cancer, including personal cancer history, family history, carcinogen exposures, lung disease, and other demographic and physical factors such as sex and race. Although the NCCN used the NLST criteria for their Category 1 recommendation, their Category 2A recommendation used less restrictive and more inclusive criteria (>50, 20 pack-years, plus one additional risk factor).

The *Lahey Lung Cancer Screening Program* began screening in 2011, adopted the NCCN criteria, and screened patients who qualified for both Category 1 and 2A. Their overall cancer detection rate (3.7%) was equivalent in both NCCN Category 1 (3.7%) and Category 2 (3.9%) subgroups, and their annualized cancer detection rates were also similar (Lahey, 1.61%; NCCN 1, 1.66%; NCCN 2, 1.54%) (McKee, 2018).

In 2013, the USPSTF adopted slightly modified NLST criteria for their 2013 recommendations (age 55-80, 30+ pack-years, and currently smoke or quit within 15 years).

The Tammemagi Prediction Model

In 2013, Tammemagi developed a more complex risk prediction model that used many more risk factors to best identify populations at risk for lung cancer (Tammemagi, 2013). The model predicted the development of lung cancer over a six-year timeframe using factors that included age, smoking status (current/former), smoking duration (cigarettes/day x years), years quit, race, education, cardiopulmonary disease (COPD) emphysema, personal history of cancer, family history of lung cancer, and body mass index. Free smartphone apps that implement the model are now available.

The European Trials – Nelson and MILD

Two European studies also evaluated the mortality benefit of LDCT lung screening. The results of the Danish Lung Cancer Screening Trial (NELSON) and the Multicentric Italian Lung Detection (MILD) studies contributed to the new 2021 USPSTF recommendations.

However, the NELSON study was essentially a study of white European men because about 85% of the patients in the study were men; there were very few females in the study (15%). The MILD trial had a slightly more balanced 65%/35% male/female ratio. In contrast, the male/female ratio in the current Lahey clinical population of lung cancer patients is about 50%/50%.

The NELSON results showed a greater mortality benefit for screening women (48%) than for men (24%). This result was not surprising because women are more likely to develop adenocarcinomas in the periphery of the lung, where they can be detected by LDCT. The MILD trial showed a 39% mortality benefit overall.

The MILD trial also investigated the effect of eliminating the early rounds of screening in its landmark analysis. The investigation showed that a 58% mortality benefit could be achieved by eliminating the baseline screens. (For cancer screening in general, there are relatively more late-stage cancers in baseline rounds of screening than in later incidence screens.) In contrast to baseline screenings, the annual screenings find proportionately more early-stage lung cancers as cancers are detected and diagnosed as they develop between annual screens.

The results from these trials seem to imply that the 20% mortality benefit seen in the NLST data will be the minimum mortality benefit seen in clinical practice.

The Updated USPSTF Recommendation

In 2021, the USPSTF made new lung cancer screening recommendations. Data published since the original 2013 USPSTF recommendation influenced the updated recommendation in March 2021. The new eligibility criteria are ages 50-80 (down from 55-80), 20 pack-years (down from 30), and currently smoke (unchanged) or quit within 15-years (unchanged).

The changes increased the eligible population by about 86% (from 8 million to about 15 million people in the United States). The CMS criteria are currently under review.

Race and Disparities

Black men and women are more likely to get lung cancer at lower smoking exposures than white people. The Chicago Race Eligibility for Screening Cohort (CREST) study investigated who would have been eligible for screening among the people in their cancer program who were diagnosed with lung cancer over a nine-year period. The CREST study found that only 50% of people with diagnosed lung cancer in their cancer program would have been eligible for screening under the 2013 USPSTF guidelines. White people (62.4%) were more eligible for screening than black people (50.3%), a difference of about 12%.

Using the original Tammemagi risk prediction model, which included sex and race, white people (66%) were less eligible than black people (71.3%), a difference of about 5% in favor of black people. Under the new 2021 USPSTF guidelines, whites (75.4%) were more eligible than black people (70.6%), with a difference of 5% in favor of white people.

Finally, adjusting the Tammemagi prediction model limit to 1%+ produced the best eligibility results. The adjustment essentially removed the eligibility disparity (whites, 81.5%; blacks, 82.8%; difference 1%) and increased the eligibility rates for the overall population as well (more inclusive access to screening for all people with cancer).

The 15-Year Quit Limit

There is no dramatic drop-off in lung cancer death rates after 15 years of cessation. Instead, lung cancer death rates plateau after cessation for some time and rise again as patient ages approach the mid-70s. The lung cancer death rate for current smokers over age 60 rises about 300% by age 80 compared to death rates from lung cancer in never smokers (Halpern, 1993).

Removing the 15-year quit limit would increase the eligible population by an additional 3 million people, and the NCCN has recommended the removal of the 15-year quit limit in their updated 2021 guidelines.

Lahey Lung Cancer Registry 2018

To further understand the effects of screening criteria on identifying at-risk populations, the Lahey lung cancer registry data for 2018 were analyzed to understand which patients would have been eligible for early detection screening under different criteria.

Among the 174 symptomatic patients with cancer (51.6% of all patients in the screening program), about 33% of them would have been eligible under the CMS criteria, about 44% under the new USPSTF criteria, about 59% under the old NCCN criteria with the upper age 80 requirement, and about 72% under the new NCCN criteria. The new NCCN criteria are age 50+ and 20 pack-years, with no upper age limit and no 15-year quit limit (the new criteria are more inclusive than the old criteria). The CMS criteria were clearly the most restrictive and included only 33% of the at-risk population.

Overall, including both symptomatic and asymptomatic patients in the Lahey 2018 registry, the new NCCN criteria would have included 80% of the patients who were diagnosed with lung cancer in 2018. Accordingly, Lahey has adopted the new NCCN lung cancer screening guidelines.

When the eligible population size was 8 million (it is now 15 million under the new USPSTF criteria), an estimated 47,904 lives would have been saved by proper LDCT screening according to the old USPSTF criteria. In comparison, that number of lives saved would have been more than the number of lives that could have been saved by completely curing breast cancer.

What Comprehensive Cancer Control Can Do To Increase Screening

The *Lahey Lung Cancer Screening Program* did the following things to improve screening rates:

- They created a sense of urgency by naming the program **Rescue Lung Rescue Life**. One concept was that if you could rescue lungs from lung cancer, you could rescue human life. Another concept was that the message aligned with rescue workers and the message that just because a patient smoked does not mean that the patient should not be rescued.
- They created a powerful coalition around the vision of rescue lung, rescue life.
- They created short-term wins by highlighting patients who benefited from screening.

- They continually shared data and program metrics with primary care physicians several times a year so that the physicians could see the effects of their clinical work.
- They took steps to address stigma to help bring about organizational change. No one deserves to die of lung cancer.

Comprehensive Cancer Control can help to increase screening by working in the following areas:

- Local infrastructure is required to run a screening program.
- Physician champions and a multidisciplinary steering committee are necessary.
- People must be able to access the local screening resources; too many barriers will reduce the volume of patients for screening.
- Patient navigators are very helpful in helping patients navigate the program.
- Primary care, physician, and public education and outreach are critical.
- Work with your local screening programs to identify their screening results and highlight them as positive messages for short-term wins.
- Advocate the use of a database to track patients using a reporting system such as Lung RADS.

The False Positive Screening Rate Myth

There is an enduring myth that lung cancer screening produces high false-positive rates. For example, there are examples of more than 100 publications in the peer-reviewed literature that (incorrectly) quote a 96% false-positive rate for lung cancer screening. The *Rescue Lung Society* is working with medical journals to generate errata notices to correct the inaccuracies.

In contrast, the false-positive rate in the NLST study was considerably lower (23%). In addition, the NLST study did not use an algorithm for screening and did not use the current Lung RADS system that was developed at Lahey in 2011. The false-positive rate at Lahey was 10% at baseline, was reduced to 7.6% across three rounds of screening, and dropped to about 5% with annual screening. (In comparison, the false positive rate for mammography is about 8%-10%.)

Integrated Cessation Interventions

Lahey program patients have a 20.8% quit rate (300% higher than in the general population), and the longer patients remain in the Lahey program, the more likely they are to quit tobacco. To increase the cessation rate, Lahey created an integrated smoking cessation intervention environment and

provided patients with literature at every opportunity, and followed the Ask, Advise, and Refer procedure wherever possible to help patients quit tobacco use.

Messaging Scripts for Patients

Coalitions should consider educating primary care physicians with a prepared script for talking to patients. For example, consider the following messages from a successful clinical script:

- Heavy smoking may cause lung cancer, which is deadly cancer that can be potentially cured if found early.
- LDCT is a proven way to find early lung cancer and is recommended just as mammography is recommended for breast cancer, a Pap smear for cervical cancer, and a colonoscopy for colorectal cancer.
- LDCT imaging may falsely detect something that does not turn out to be cancer, but this rarely happens (less than 8% false positives and less than 1% invasive procedures for something that turns out to be benign).
- The benefits of detecting early cancer outweigh any risks of the procedure. I strongly urge you to take this test.

The Massachusetts Coalition Example

In Massachusetts, only 2%-4% of the eligible population had been screened for lung cancer. To increase screening across the state, the *Massachusetts Comprehensive Cancer Prevention and Control Network* established a lung cancer working group. The group surveyed the screening sites throughout Massachusetts to assess barriers to screening and found that the greatest challenges were lack of infrastructure, resources, coordination of follow-up scans, limited staff for the workload, difficult data tracking, and getting accurate information from facility proprietors.

Screening facilities indicated a desire to learn more about data tracking, shared decision-making, smoking cessation counseling, and documentation of those efforts. For example, 89% of 27 survey respondents were interested in participating in a statewide learning collaborative to assure patient access to LDCT screening in Massachusetts.

The *Massachusetts Lung Cancer Learning Collaborative* was formed and held its kickoff meeting on March 14, 2018. Sponsors included the ACR, the *Massachusetts Radiological Society*, the *American Lung Association*, the *American Cancer Society*, the *Massachusetts Lung Cancer Alliance*, and the *Massachusetts Health and Hospital Association*. Fifty-nine people from 28 screening facilities

attended. Later meetings focused on quality improvement, engaging primary care, shared decision-making, disparities, and smoking cessation. Two results of the collaborative were two free online continuing medical education risk programs that were developed in conjunction with the *Massachusetts Medical Society*.

Conclusions

- Organizational change on local, national, and regional levels are needed; state Comprehensive Cancer Control Programs can help to accomplish this change.
- Stigma, nihilism, education, infrastructure challenges can be addressed by state CCC programs.
- Correcting misinformation is necessary for primary care engagement.
- Screening has the power to save more lives than those lost to breast cancer each year.

Questions and Answers

- There is insufficient data on vaping to advise people about their cancer risk from vaping.
- None of the randomized screening trials investigated the impact of radon exposure because it is difficult to quantify as an issue.
- It can be challenging to obtain enough lung cancer screening data to identify populations at risk at the county level, but there are new maps being developed that look at risk.
- The CMS screening criteria are still at age 55-77 and 30 pack-years, so they are an outlier and under current review.

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