

November 2019

Lung Cancer Screening

Winning Strategies for Program Development





Progress through Collaboration:

The Lung Cancer Screening Implementation Guide

The United States Preventive Services Task Force recommends lung cancer screening for those considered at high risk, because if caught before it spreads, the likelihood of surviving five years or more improves to 56 percent. Implementing a screening program to support patients is complex, which may be contributing to the slow adoption of lung cancer screening programs in community hospitals and healthcare systems.

The American Lung Association worked with the American Thoracic Society to convene experts from diverse disciplines to develop the Lung Cancer Screening Implementation Guide. The Guide recognizes that a successful screening program requires careful coordination and offers an overview of the general structure of screening programs and topics for consideration, including pitfalls and resources.

Designed to help individuals quickly find the right information as they are tackling a particular issue, the interactive website includes sections on:

- Initiating a Lung Cancer Screening Program
- Radiology Requirements
- Shared Decision Making
- Referring Physicians
- Program Navigation & Data Tracking
- Resources

We know that lung cancer screenings have the potential to save an estimated 25,000 lives if every American at high risk were screened. The Lung Cancer Screening Guide is a bold step to expanding access to lung cancer screening across the country, giving more hope to those at risk of lung cancer.



See the full Guide at
LungCancerScreeningGuide.org.



IMAGING 3.0 IN PRACTICE

Lung Cancer Screening: Winning strategies for program development



More people in the United States die of lung cancer than any other cancer. The disease's mortality rate is high because it often goes undiagnosed until the later stages, when treatment is difficult. But it doesn't have to be that way – and we can change it.

Early detection is key, and the best way to find lung cancer before it becomes symptomatic is through low-dose CT (LDCT) lung cancer screening. The results of the National Lung Screening Trial showed that LDCT lung cancer screening saves lives, leading CMS to issue a national coverage decision for eligible patients in 2015.

Although CMS and most private insurers now cover lung cancer screening, the majority of the estimated 8 million eligible Americans are not enrolled in a screening program. We must stand up to ensure patients have access to and are informed about this life-saving care. The ACR Patient- and Family-Centered Care Commission's Lung Cancer Screening 2.0 Steering Committee is committed to empowering radiologists to lead screening programs.

Implementing a lung cancer screening program takes commitment, resources, and time. But radiologists are well-positioned to manage these programs and ensure patients are guided into appropriate care pathways. It's one more way we can leverage our expertise to ensure patients receive the care they need, when they need it. It also gives us another opportunity to interact with patients and witness the meaningful impact of our work.

The Imaging 3.0 case studies in this issue highlight how radiologists across the country have led the development of successful lung cancer screening programs. Each article details the steps the radiologists took to build their programs and enroll patients, while also outlining the results and next steps. Along with these valuable stories, this issue includes resources you can use to start or advance your own lung cancer screening program.

Together, we must expand the availability of lung cancer screening to ensure all patients who need it are enrolled. With lung cancer accounting for 25% of all U.S. cancer deaths – lives depend on it.

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Have a case study idea you'd like to share with the radiology community? To submit your idea, please visit acr.org/Suggest-a-Case-Study.



A Proactive Role for Radiology

In partnership with referring PCPs, radiologists in Boston built a life-saving lung cancer screening program for high-risk patients across their hospital network.

KEY TAKEAWAYS

- After the National Lung Screening Trial proved that low-dose CT lung cancer screening could reduce mortality rates, a radiologist in Boston led development of a practical screening program.
- Leaders of the screening program meet regularly with primary care physicians throughout the hospital network to build trust and collect input for improving the program.
- Automated patient qualification and enrollment, along with centralized administration and follow-up, reduce the burden of patient management for referring physicians while keeping them in the loop.

Only 16% of lung cancers are diagnosed early, when the five-year survival rate can be as high as 90%. The rest aren't detected until the disease reaches the advanced stages.¹ By the time lung cancer spreads and triggers symptoms, the five-year survival rate plummets to just 5%² — giving it the highest mortality of any cancer and accounting for 25% of all cancer deaths in the United States.

Fortunately, advanced screening technologies can improve this prognosis through earlier detection of lung nodules. The National Cancer Institute demonstrated this with the National Lung Screening Trial (NLST) (Learn more at bit.ly/Lungtrial), which started in 2002 and revealed that participants screened with low-dose CT (LDCT) were at least 20% less likely to die from lung cancer.³

The NLST sparked one of the country's first LDCT lung cancer screening programs at Beth Israel Deaconess Medical Center (BIDMC), a Harvard Medical School Teaching Hospital in Boston. Since launching LungHealth® in March of 2016, radiologists at BIDMC have performed 2,200 LDCT exams to screen 1,390 patients who are at high risk for lung cancer.

"Through this program, we are catching and detecting lung cancer earlier, at a stage when patients can still undergo treatment and survive," says Alexander A. Bankier, MD, PhD, medical director of LungHealth at BIDMC. "So far, we've caught 25 cases of lung cancer, 24 of which were early stages, and I don't think it's overly immodest to say that we saved these patients' lives. LDCT lung cancer screening shows how imaging can play a proactive role in disease prevention, not just detection."

Support for LDCT Screening

Years before establishing LungHealth, BIDMC participated in the NLST as one of 33 trial screening sites that conducted exams for the nationwide study. Bankier joined the hospital around 2008 as the trial was ending and became committed to permanently

implementing LDCT lung cancer screening at BIDMC.

"When the results of the trial were published in 2011, it gave the idea a new boost," says Bankier, who is also a professor of radiology at Harvard Medical School and chief of the cardiothoracic imaging section and director of functional respiratory imaging in the radiology department at BIDMC. "But there wasn't a lot of enthusiasm in the beginning because some members of the hospital administration were concerned that this would never be financially sustainable."

The idea gained traction at BIDMC between 2012 and 2014 as several professional groups — including the American Cancer Society, the American Thoracic Society, the American Society of Clinical Oncology, the U.S. Preventive Services Task Force, and the ACR — began recommending LDCT lung cancer screening. The final piece of support came in 2015, when CMS issued a national coverage decision to reimburse LDCT lung cancer screening. (Read the decision at bit.ly/CMSDecision)

"The confirmation of reimbursement from major insurance companies made it possible to implement this idea in practice," Bankier says. "For the first time, we had reimbursement estimates, which helped us make the case that an LDCT lung cancer screening program made sense economically."

Bankier worked with the hospital's strategic planning division to build a business plan that illustrated the program's potential. Together, they estimated the number of high-risk patients within the healthcare system's reach who would qualify for lung cancer screening based on Medicare's eligibility criteria. (Learn more at bit.ly/lungeligibility) Then, they calculated potential revenue from regular screenings, as well as downstream revenue from positive findings, incidental findings, and follow-up scans.

"The administration wanted to see numbers to justify whether this program would

be economically viable,” Bankier says. “But there’s also a value aspect that you can’t put a dollar amount on, because you’re offering preventive care that can improve the health of your patients and potentially save lives.”

The First Step

By addressing the program’s economic potential and patient value, Bankier secured the approval of the hospital administration, with full support from the radiology department. The hospital provided funds to hire a program manager, which was a critical first step in the program’s development.

“The one thing I learned from witnessing the final phase of the NLST was that the administration and patient management aspects of lung cancer screening are at least as important as the medical aspect,” says Bankier, noting that BIDMC added a full-time administrative position for the duration of the NLST. “From the very beginning, I emphasized the need for a dedicated person to run this program.”

In late 2015, Lauren M. Taylor, RN, BSN, joined the team as program manager, and together, she and Bankier began planning how to run a screening program. Administratively, Bankier and Taylor had to plan step-by-step how to qualify eligible patients for enrollment (See bit.ly/BIDMCLung), order screening exams, discuss shared decision making, design a structured reporting template, organize subspecialty reads, handle incidental findings, and coordinate annual follow-ups through ongoing patient management.

PCPs as Partners

Bankier and Taylor quickly learned that implementing a screening program was markedly different than providing diagnostic imaging. “Preventive screening requires a completely different context, because we don’t see patients with symptoms,” Bankier says. “We see individuals who are at risk for a disease and want to stay healthy.”

Since ideal candidates for lung cancer screening typically don’t walk into the hospital seeking a diagnosis, Bankier had to reach high-risk participants proactively — through their primary care physicians (PCPs). Early in the planning process, Bankier and Taylor met



Through its lung cancer screening program, the radiology department at Beth Israel Deaconess Medical Center has detected 24 lung cancers in the early stages, when the disease is still treatable.

with PCPs to build buy-in while fine-tuning the details of the program.

The goal of these conversations was twofold: first, to educate referring physicians about the screening program so they could, in turn, inform their patients; and second, to gather PCPs’ feedback and concerns. “A few of these physicians were enthusiastic about the idea of LDCT lung cancer screening, but there was also a substantial number of skeptics,” Bankier says. “We learned a lot from these conversations, and the input from physicians helped us improve the program.”

Most of the early concerns echoed the same risks that were documented in the NLST findings and other research — such as overdiagnosis of lung cancer and incidental findings unrelated to lung cancer. Many PCPs worried that the program would add more administrative work and patient management duties to their workloads, and others feared they’d lose control over patients who enrolled.

“By knowing the referring physicians’ concerns, we were able to tailor the program on the front end to make them more comfortable enrolling patients,” Taylor says. “We realized how important it was to reduce their administrative burden, while keeping them

continuously in the communication loop so they didn’t lose contact with their patients.”

Collaborative Partners

After meeting with referring physicians within the hospital, Bankier and Taylor worked their way outward to reach referrers throughout BIDMC’s network, which spans 45 affiliate locations, including primary care practices and community healthcare centers across the Greater Boston area. “The segment of our population that qualifies for LDCT lung cancer screening often includes the same people who receive care at our community healthcare centers,” Bankier says. “A relatively high smoking population exists within these groups, so there’s a proportionately higher number of high-risk patients in these pockets.”

Bankier recognized that the community healthcare centers in BIDMC’s network would be critical partners for the screening program. “Nancy Kasen, the chief of the community healthcare centers, was immediately onboard, because she understood the importance of screening these patients,” Bankier says. “From day one, the community healthcare centers and the patients they represent were a strong pillar on which our program was built.”



Alexander A. Bankier, MD, PhD, professor of radiology at Harvard Medical School and chief of the cardiothoracic imaging section and director of functional respiratory imaging at Beth Israel Deaconess Medical Center, developed an LDCT lung cancer screening program to detect lung nodules as early as possible. As LungHealth Program Manager, Lauren M. Taylor, RN, BSN, handles all patient management, tracking, and follow-up.

better chance of picking up lung cancer early and treating it. It has saved lives and could save your life someday.”

Aronson says he’s never had a high-risk patient decline his screening recommendation. He has enrolled about 20 patients into the program since it launched.

When Marsha DiCesare’s primary care physician told her about the screening program during her annual physical, it seemed like a “no brainer.” If you’re a former smoker, it’s always in the back of your mind, because we all know how bad smoking is for your health,” says DiCesare, 59. “Lung cancer doesn’t usually present symptoms until it’s pretty advanced, so after smoking for many years, screening gives me peace of mind.”

Workflow Design

With the goal of making the program convenient for both referring physicians and patients, Bankier and Taylor designed a workflow focused on proactive patient management and thorough follow-up. “Once enrolled in the screening program, every patient gets a shared decision-making phone call from me that explains the benefits, risks, what to expect when they arrive for their exam, what to expect on their report, and what happens if there’s a positive finding,” Taylor says. “We talk through all the steps, and I introduce myself as the central contact person who will help them through all of it.”

BIDMC offers screening exams at three (soon to be four) locations throughout the hospital network, and scans are read centrally by a small group of subspecialty-trained radiologists. Technically, any CT equipment can be programmed with the low-dose protocol, allowing for future expansion.

When patients arrive for their initial LDCT screening, they first meet privately with a radiologist to discuss the program. “Having the conversation with the radiologist really put my mind at ease and made me feel comfortable and well informed,” says DiCesare, who had her first screening in the spring of 2017.

Coordinated Care Decisions

Screening results are sent to patients and their referring physicians within a week. Most screening results come back negative, Bankier

Relationship Building

For months before the program began in 2016, Bankier and Taylor met regularly with referring physicians throughout the network. Since then, they’ve continued to check in every few weeks. “In our experience, the most effective way to reach patients has been through regular in-person visits with referring physicians,” Taylor says. “The referring physicians are our closest partners in terms of educating patients about the program and getting them to enroll.”

Bankier emphasizes that these visits can’t be phoned in or delegated, because relationships with referring physicians are critical to a screening program’s success. “The best advice I can give other radiologists is to seek as much personal contact with referring physicians as possible,” Bankier says. “Referring physicians delegate some of their responsibility to us in terms of patient management, so it’s very important that they know to whom they’re entrusting their patients.”

Primary care physicians like Mark D. Aronson, MD, appreciate knowing that the LungHealth team handles patient qualification, education, tracking, and administration centrally, so referring doctors don’t have to spend time on those things. “The radiologists set up a system to track lung cancer screening candidates and take ownership of patient management,” says Aronson, vice chair for quality in the department of medicine at BIDMC and professor of medicine at Harvard Medical School. “Once a patient’s enrolled in the program, I don’t have to worry about

reminding them to get their annual scan. That’s valuable, because it’s very difficult for doctors to keep track of each individual when they have so many patients.”

Patient Enrollment

Taylor and Bankier knew they needed to make it easy for referring physicians to enroll patients into the program. To that end, they worked with the hospital’s IT department to develop an in-house tool that allows referring physicians to enroll qualified patients — those between the ages of 55 and 77 with a smoking history of at least 30 pack-years, who either currently smoke or quit within the last 15 years — with just a few clicks.

“They developed a tool within our ordering system that calculates a patient’s smoking history in pack-years,” Aronson says. “So, if a patient smoked half a pack a day for 10 years, then a full pack a day for 15 years, and then five cigarettes a day for the last 10 years — the calculator determines the accumulated pack-years. Once they exceed 30, they fall into the screening protocol, and the system automatically prompts us to recommend the program.”

Referring physicians just click the pop-up notification, and the system automatically issues a screening exam order, auto-populated with the patient’s inclusion criteria. When Aronson sees the smoking history pop-up, he’ll tell the patient: “You fit into our lung cancer screening protocol. I recommend that you get screened, because studies show that if we screen you regularly, we have a much



“We can make a multidisciplinary management decision based on our discussion, and then immediately organize the next steps.”

—Alexander A. Bankier, MD, PhD

says, so the typical recommendation is for patients to return in a year for annual screening. Some findings may require patients to return in three to six months for a re-scan. More suspect findings, however, require a collaborative multidisciplinary discussion.

Every suspicious case (with nodules classified as 4B or 4X, according to ACR’s standardized LUNG-RADS® assessment categories bit.ly/ACR_LungRADS) is discussed at a weekly thoracic oncology conference. During each conference, multiple disciplines related to thoracic disease come together, including radiology, thoracic surgery, thoracic pathology, interventional pulmonology, respiratory medicine, nuclear medicine, oncology, and radiation therapy. Bankier also invites referring physicians whose patients are being discussed.

At the conference, the reading radiologist takes the lead — sharing the clinical findings of each case and then moderating the discussion as various subspecialties chime in about the upsides and downsides of potential next steps, including biopsy, surgery, or simply waiting three to six months for a follow-up scan. “The advantage of this setting is that we can make a multidisciplinary management decision based on our discussion, and then immediately organize the next steps,” Bankier says. “We can refer the patient to the thoracic surgeon, the referring physician, or the specialist, all of whom are usually at the conference and already know the patient’s history. That’s a huge advantage for patient management.”

If primary care physicians are unable to attend these conferences, Taylor takes notes and reports back to keep them informed. She also schedules any follow-up exams or appointments — whether it’s surgery, a routine screening, or a re-scan in several months — while maintaining ongoing contact with referring physicians. “We try to be cognizant of the referring physician’s time, but also

keep them totally apprised of their patients,” she says. “Sometimes I’ll just send an email, and then if it’s acute, I also call them. But we track it and order it all centrally, so we’re taking that administrative burden off of the referring physicians.”

Growth Opportunity

In addition to detecting lung cancer as early as possible, the screening program is catching other abnormalities, including cardiac disease and abdominal issues. (Read the “Standardized Findings” case study at bit.ly/StandardizedFindings to learn more.)

Perhaps more importantly, patients enrolled in the program are more likely to reduce their smoking habits or stop altogether. Smoking cessation information and support are offered through the program, and Taylor even became a certified smoking cessation counselor to help patients stop smoking. “If we’re telling you that you’re at high risk for lung cancer because of smoking, it’s a big incentive to quit smoking,” says Aronson, who’s noticed that all of his patients have stopped smoking since enrolling.

To build on these positive results, Bankier has a vision to continue growing the screening program: expanding into new affiliate healthcare sites, increasing patient enrollment, and ultimately broadening the program’s overall reach. “The program is named LungHealth — not specific to cancer but really about overall lung health,” Bankier says. “In the future, we might be able to use the information we acquire, not only for preventing cancer but also to look at other respiratory diseases where early detection may benefit the patient. We want to be as comprehensive as we can to save as many lives as possible.”

By Brooke Bily



The screening program has been well-received by referring physicians like Mark D. Aronson, MD, vice chair for quality in the department of medicine at Beth Israel Deaconess Medical Center and professor of medicine at Harvard Medical School.

ENDNOTES:

1. Knight SB, Crosbie PA, et al. Progress and prospects of early detection in lung cancer. *Open Biol*. 2017 Sep; 7(9): 170070. doi: 10.1098/rsob.170070. Published online 2017 Sep 6.
2. Seigel RL, Miller KD, et al. Cancer facts & figures 2018. *CA: A Cancer J Clin*. 2018; 68:7-30. doi.org/10.3322/caac.21442
3. National Lung Screening Trial Research Team. Reduced lung-cancer mortality with low-dose computed tomographic screening. *N Engl J Med*. 2011 Aug 4; 365(5):395-409. doi: 10.1056/NEJMoa1102873. Published online 2011 Jun 29.

Next Steps

- Meet personally with referring physicians to share ideas about implementing a lung cancer screening program that makes practical sense for everyone involved.
- Encourage radiologists to take a more proactive role in patient care by meeting with participants before screening exams to discuss the process and alleviate concerns.
- Build a multidisciplinary team to regularly discuss complex cases and improve patient care through collaboration.



Breathe Easier

Indiana radiologists work alongside care partners to create a successful lung cancer screening program that addresses a population health need.

KEY TAKEAWAYS:

- Radiologists at Elkhart General Hospital (EGH) collaborated with referring clinicians and administrative staff to organize, market, and manage a lung cancer screening program.
- Since founding the program in 2012, the EGH team has diagnosed 29 lung cancers, more than 50% of which were Stage 1.
- Now, EGH is working with sister hospitals within Beacon Health System to develop similar lung cancer screening programs at those institutions.

According to the Centers for Disease Control and Prevention, 25.6% of Indiana residents smoked in 2011, and the state ranked fifth in the nation for number of smokers. In the northern Indiana city of Elkhart alone, smoking was so prevalent that many residents identified it as a top concern in a 2011-2012 community health assessment. These findings prompted radiologists and other providers at Elkhart General Hospital (EGH) to consider the dangerous effects of smoking on their community and act to address them.

One of the most obvious impacts of smoking is a high mortality rate. Lung cancer is a leading cause of cancer deaths in the U.S.¹, and research indicates that identifying high-risk patients and screening them for cancer with low-dose computed tomography (LDCT) can reduce lung cancer mortality by up to 20% among smokers.²

Unfortunately, though, most at-risk patients do not undergo regular screening, and many patients go undiagnosed until symptoms arise in the later stages of the disease. By that point, the chances of effectively treating the disease are low. The five-year survival rate for patients with early-stage lung cancer can be as high as 90%, while the late-stage survival rate is only 5%. Hoping to give its patients a better chance of survival, EGH partnered with its existing smoking cessation group to establish a lung cancer screening program six years ago.

Since then, the program has undergone many changes, but most importantly, it is getting results: EGH radiologists have diagnosed more patients with early-stage lung cancer than they did before implementing the program. Of those diagnosed through the program, more than 50% had Stage 1 lung cancer. "It is critical to detect lung cancer early, before patients become symptomatic," says Allison M. Lamont, MD, chair of radiology at EGH. "If patients become symptomatic, it is often too late. This is a life-saving program."



Allison M. Lamont, MD, chair of radiology at Elkhart General Hospital, says that "old-fashioned dialogue" was critical to educating referring physicians about the benefits of lung cancer screening.

Getting Started

EGH's lung cancer screening program began taking shape in 2012, after the hospital secured a CT scanner for the program. An oncology nurse proposed establishing the screening program during a quarterly meeting of the hospital's cancer committee, which includes representatives from the departments involved in oncology care. The radiologists, cardiologists, and pulmonologists in attendance immediately supported the idea — recognizing that it would address an urgent population health need.

"As a radiology department, we are committed to offering new services that will improve patient health," explains Albert W. Cho, MD, vice chair of radiology at EGH. "We had been interested in developing a lung cancer screening program for a while to address this public health crisis. Once we had the scanner available and buy-in from other departments, we saw an opportunity to help drive the implementation."

To start, the radiologists met with specialty

partners, administrative staff, and care coordinators to construct a framework for the program. "One of the most exciting aspects of this program has been working with the other specialties and with hospital administrators," Cho says. "There is often a view that specialties, particularly radiology, are independent and operate on their own, but working together has so many benefits, such as increased camaraderie throughout the hospital and enhanced dialogue among specialties to better serve patients. It's very rewarding."

Building a Business Case

One of the first things the team had to define was eligibility criteria for lung cancer screening patients. The Centers for Medicare and Medicaid Services (CMS) had not yet issued guidelines for reimbursement of lung cancer screening, so the Elkhart team decided to follow the National Comprehensive Cancer Network's screening guidelines, which state that high-risk eligible patients are between 50 and 74 years old with a history of smoking at least 1.5 packs of cigarettes per day for 20 years or more.

From there, the team focused on the program's business case. Since CMS did not yet cover lung cancer screening, the team had to determine how much to charge for the service. They needed to cover the program costs without pricing out patients, particularly low-income patients. "We wanted to market this as something that patients would value and find important, while giving them some perspective on the cost of care," Lamont explains.

The team ultimately decided to charge \$199 out of pocket — the rough equivalent to one and a half packs of cigarettes per day for a month, a fact they advertised to help patients understand the value of this potentially life-saving service. While the price would just cover the program costs, the team determined that the potentially life-saving benefits were more important, and they remained steadfast in their desire to not financially overburden patients.

With these details in hand, several radiologists and a nurse practitioner dedicated time to gaining hospital administrator and physician buy-in for the program. They gave presentations to physicians in cardiology,

pulmonology, and oncology, and to hospital administrators during regularly scheduled meetings. "We helped others understand the criteria and the things that had to be calculated for the program to work, such as the scheduling processes and patient flow between the radiologists and the nurse practitioner in charge of follow-up," says William T. Molen, MBA, director of imaging services at EGH.

While the program was not expected to generate a profit, everyone who heard the presentations unanimously supported the effort. "If you step back to examine what's best for the patient, you quickly realize that this program is a good thing," Molen says. "If we break even at worst, it's easy to prioritize the program."

Marketing the Program

Once the program was up and running in June of 2012, the team ran into two notable hurdles. The first involved enrolling patients in the program. Initially, the team marketed the program directly to smokers in Elkhart County. Radiologists and other physicians worked a booth at the county fair, where they spoke to smokers about lung cancer screening and distributed marketing materials. Patients, however, were not immediately interested in the program.

"It's a need, but at the same time, it's a bit of a hard sell," Molen explains. "Women know they should get mammograms because their cancer risk naturally increases with age. With smokers, it's different because they know they are doing something that's bad for their health, so they're often reluctant to pursue screening."

After realizing this, the team changed course and began focusing most of its marketing efforts on cardiologists and other referring physicians who regularly treat smokers. Radiologists mentioned the program during tumor boards and quarterly staff meetings, as well as in conversations with referring physicians.

Soon, primary care and other referring physicians began inquiring about the program, with cardiologists ultimately referring the most patients. "We took these opportunities over the phone or in person to really educate referrers about how screening can detect lung



Albert W. Cho, MD, vice chair of radiology at Elkhart General Hospital, and his team developed the lung cancer screening program to address an urgent population health need.

cancer in the early stages, when it's still treatable," Lamont says. "Expanding participation in the program really came down to old-fashioned dialogue."

Covering the Cost

The second obstacle that radiologists faced involved the cost of care. Even though the price the hospital charged for screening was low relative to the cost of the service, some patients could not afford it. Rather than turning these patients away, the committee sought funding from the Elkhart Hospital Foundation to cover their screening.

An advanced practice nurse for oncology services at EGH delivered a presentation to the foundation's board about the benefits and cost-effectiveness of the program. After hearing about the important role lung cancer screening plays in saving lives, the board unanimously agreed to cover the cost of screening for individuals who met the program requirements but could not afford it.

By 2015, CMS began covering lung cancer screening for Medicare patients who meet specific guidelines, so the hospital foundation no longer needed to subsidize the program for many patients. (Learn more at bit.ly/CMSDecision) What's more, the out-of-pocket cost of screening at EGH eventually decreased



William T. Molen, MBA, director of imaging services at Elkhart General Hospital, says that while the screening program didn't initially generate much revenue, the important thing is that it was saving lives.

to \$165 once the program started generating downstream revenue for the hospital. "We are perfectly OK with doing the exam for a very low cost because it is an opportunity to bring patients into our systems for care," Molen explains. "More importantly, it saves lives. When you find cancers and find them early, everyone wins."

Program funding wasn't the only thing that changed once CMS and other payers began covering lung cancer screening. EGH also updated its eligibility criteria to meet the CMS lung cancer screening guidelines and met the requirements to become an ACR Designated Lung Cancer Screening Center, a designation that includes minimum technical specifications and ACR CT accreditation. (Learn more at bit.ly/ACRLCSCenter)

While achieving this designation required radiologists to alter the way they classify patients, they rose to the challenge to better serve patients. "We have adapted to everything that has come down the pike," Lamont says. "We have been willing to adjust, because we care about the program and know it's a valuable service that meets an important community need."

Seeing Results

The team's diligence has paid off. Between June of 2012 and June of 2017, EGH's lung cancer screening program served 941 patients. Of those, 29 were diagnosed with

lung cancer, one was diagnosed with renal cell carcinoma, and two were diagnosed with lymphomas. Many of these patients were asymptomatic, so their cancers may have gone undiagnosed for some time, if not for the screening program.

Patients who are diagnosed through the lung cancer screening program are invited to participate in EGH's thoracic oncology clinic. (Learn more in the "Patient Forward" case study on page 24.) Started as a way to deliver comprehensive, patient-centered care to lung cancer patients, the clinic gives patients and families a chance to meet in person with their multispecialty care team to ask questions, review images, and discuss treatment options.

"Patients and families go into the thoracic oncology clinic and are in awe because there are so many people there to help them," says Cindie L. McPhie, vice president of operations at Beacon Health System and EGH, where she has been involved in the lung cancer screening program's development from the start. "It gives them an amazing sense of comfort when they realize they have something this valuable right in their backyard."

Growing the Program

Based on the success of the lung cancer screening program at EGH, radiologists and administrators are now helping EGH's sister hospitals within Beacon Health System in Indiana develop screening programs of their own. For example, collaborative efforts among imaging directors at EGH and Memorial Hospital in South Bend, Ind., have led to a budding lung cancer screening program at Memorial.

The growth opportunities in the surrounding hospitals encourage McPhie. "As we evolve more as a system, we will create avenues to help facilitate these programs in our other hospitals," she says. "We have the potential to serve more people and save more lives in our community through this program."

Molen agrees. "One of our mottos here at EGH is putting the patient at the center of everything that is happening," he says. And his advice for others contemplating developing a lung cancer screening program is straightforward: "Know your doctors, community, and health system, and build programs appropriately to fit your system. Be persistent. For

every one of those patients who has a serious health condition or cancer, it can be a huge difference between surviving and not surviving, and that makes everything worthwhile."

It's clear that lung cancer screening is saving lives in the Elkhart community. EGH physicians and administrators urge others to find ways to initiate these programs around the nation. "We are just a little community hospital," says Lamont, "but look at what we have done. We support each other, and we encourage each other. Profound change can stem from that sort of teamwork."

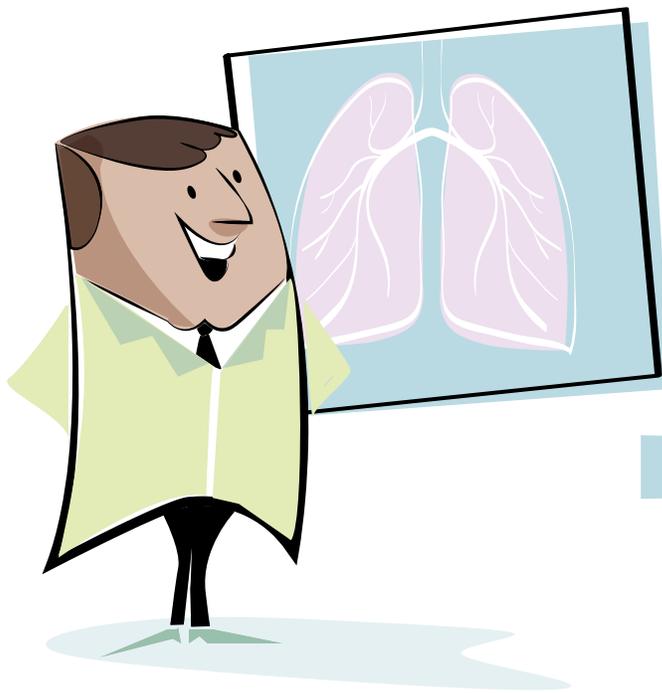
By Chelsea Krieg

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Next Steps

- View the most recent community health assessment in your area and determine what kinds of programs might be beneficial to your area's patient demographic.
- Present new program ideas at tumor boards or other regularly scheduled multidisciplinary committee meetings to get buy-in and partners who will refer patients.
- Seize opportunities to educate referring clinicians about the benefits of and opportunities that screening programs afford.



So You're Coming in for Lung Cancer Screening

Here's the information you should know before undergoing a low-dose CT scan.

Should I be screened?

Currently, lung cancer screening is recommended and covered by most insurance plans and Medicare for specific high-risk individuals. A CT scan is currently covered for those who meet the following criteria:

- * Are age 55 to 77
- * Currently smoke or have quit smoking within the last 15 years
- * Have a tobacco smoking history of at least 30 "pack years" (an average of one pack a day for 30 years, 2 packs a day for 15 years and so on)

What are the risks and benefits of screening?

The CT combines special X-ray equipment with sophisticated computers to produce multiple cross-sectional images of the inside of the body.

Risks: Cancer screenings are not perfect. Many people who have smoked have small nodules (a relatively round area of abnormal tissue) in their lungs. Mostly, these are not lung cancer. Sometimes, a test appears to be abnormal, but no lung cancer is found (this is called a false-positive finding). These findings may require additional testing, such as another CT (most likely) or a biopsy (less likely) to determine whether or not cancer is present.

With a low-dose CT scan (LDCT) there is minimal risk of any effects from radiation exposure. The machine uses about one-fifth the amount of ionizing radiation as a standard chest CT scan. The amount of radiation from a LDCT scan is about the same as an average American receives in six months from natural background radiation by living on planet Earth.

Benefits: LDCTs are painless and noninvasive procedures that can find lung cancer when it's in early stages with a good chance for a cure.

How effective is a CT scan?

Because CT scans can detect even very small nodules in the lung, they are especially effective for diagnosing lung cancer at its earliest, most treatable stage. In fact, about 80 percent of lung cancers are found at an early stage when there is a good chance of a cure. Without screening, more than 70 percent of lung cancers are found at a late stage with little chance of a cure.

How will the exam be performed?

The technologist will position you, often lying flat, on the exam table. You will be asked to raise your arms over your head. Then, the table will move more slowly through the machine as the CT scan is performed. You'll hold your breath while the machine is scanning, usually for about 5 to 10 seconds. This ensures that your lungs do not move, creating a more clear image. The entire exam should take around ten minutes total.

What will happen after my scan?

After your appointment, the radiologist will look at the results, search for anything of concern, put together a report that discusses anything unusual that showed up in the images, and make recommendations for any follow-up care. The radiologist then sends the report to the physician who referred you for the screening.

What if the radiologist detects something?

If the radiologist detects anything of concern, he or she will likely recommend a follow-up CT scan several months later to check that the nodule does not change in size. If you have an infection or any inflammation in your lungs when you get your LDCT, you will likely be recommended to have a follow-up scan in about a month to make sure the issue went away and is not something else. For the small percentage of people with abnormalities that are concerning for lung cancer, more immediate testing, such as a PET scan, may be necessary, as well as a referral to a specialist such as a pulmonologist. Sometimes the scan will find something else that is not lung cancer but may be significant to your health. In most cases, these are not serious, but your physician may recommend additional tests such as an ultrasound to get more information. Your physician may also refer you to a specialist.

- * Get information about lung cancer screening and other medical imaging at Radiologyinfo.org and the American Lung Association's Lung.org.
- * Visit ShouldIScreen.com to decide if lung cancer screening is right for you.





Early Detection Matters

Radiologists in Michigan collaborate with administrators and care partners to develop a successful lung cancer screening clinic and enhance population health.

KEY TAKEAWAYS

- After numerous trials proved that low-dose CT lung cancer screening could reduce mortality rates, a radiologist in Michigan spearheaded a dedicated clinic in line with Imaging 3.0™ and other leadership practices he learned through the ACR's Radiology Leadership Institute®.
- The lung cancer screening clinic has served nearly 2,500 patients to date, with a 3% lung cancer detection rate and a Stage 4 detection rate that is 8% better than the national average.
- To encourage maximum participation, the team focused on eliminating potential hurdles for both patients and referring physicians.

More people die of lung cancer than any other cancer. According to the American Cancer Society, lung cancer accounts for a quarter of all cancer deaths in the U.S.¹ The good news is that when lung cancer is diagnosed early, the five-year survival rate can be as high as 90%.²

Multiple research studies show that lung cancer screening decreases lung cancer mortality. Data from the National Lung Screening Trial (NLST) in 2011, showed a 20% reduction in lung cancer mortality in patients who received low-dose CT (LDCT).³ (Learn more at bit.ly/Lungtrial) Based on the study, the U.S. Preventive Services Task Force made lung cancer screening with LDCT a public health recommendation in 2013. And both CMS and private insurers now cover lung cancer screening for qualified individuals — with no copay or cost-sharing by the patient. (See coverage qualifications at bit.ly/CMSDecision)

Despite these advances, millions of smokers and former smokers who qualify for lung cancer screening are not getting the preventative scans that could save their lives. So, a cadre of radiologists is stepping up to lead lung cancer screening programs that break down the barriers to patients getting the care they need before it's too late.

One such radiologist is Samir J. Parikh, MD, MBA, who launched a lung cancer screening clinic in Jackson, Mich., in 2015. Since its inception, the clinic has served nearly 2,500 patients, with a 3% lung cancer detection rate. The goal of the clinic is to detect lung cancer early, when there is still time for life-saving treatment — and it's working. At a national level, 44% of lung cancers are not detected until Stage 4. In Jackson County, the late-stage cancer rate is just 36%.

Here's how a dedicated team of caregivers implemented this life-saving lung cancer screening program, enabling earlier detection and treatment of this deadly disease.



Recognizing that radiology is central to lung cancer screening, Samir J. Parikh, MD, MBA, a diagnostic radiologist at Jackson Radiology Consultants, collaborated with care partners to establish a dedicated clinic.

Stepping Up to Lead

As the healthcare industry recognizes that lung cancer screening saves lives, radiologists like Parikh are also positioning themselves to deliver more value-based care for patients. Trained in cardiopulmonary radiology with a focus on lung diseases, Parikh immediately recognized that radiology is central to lung cancer screening and volunteered to lead a lung cancer screening program for his health system, Henry Ford Allegiance Health.

"Lung cancer detection starts with a CT of the lungs, so the radiologist is at the center of the entire chain of care," Parikh says. "As we began considering a lung cancer screening program, I was also learning about Imaging 3.0™ and other leadership practices through the Radiology Leadership Institute®. (Learn

more at acr.org/imaging3 and acr.org/RLI Learning about the importance of value over volume and leadership best practices sparked me to ask the question, ‘How can I make a difference in patient care?’”

For Parikh, the answer was to ensure that his practice was among those developing and implementing a lung cancer screening program. Parikh is a diagnostic radiologist at Jackson Radiology Consultants, a small private practice serving Henry Ford Allegiance Health, a medium-sized community hospital in Jackson County. He shared his idea for the clinic with his colleagues at the eight-radiologist practice, and they were immediately on board.

Improving Population Health

Parikh is a member of the health system’s multidisciplinary lung disease site team, a group dedicated to improving care around this particularly deadly cancer. As such, he began talking with other care partners on the site team, including pulmonologists, thoracic surgeons, and hospital administrators, about establishing a lung cancer screening clinic in 2015 as an adjunct to its existing lung nodule program.

After reviewing the area’s demographic data, the team determined that a lung cancer screening program was a particularly worthwhile endeavor for the patient population the health system serves. In Jackson County, 30% of the population smokes, and in Jackson city, 35% of residents are smokers — compared with 23% of residents throughout the state of Michigan. “We have a significantly higher number of smokers in our community than the rest of the state, so many people meet the criteria for lung cancer screening,” Parikh explains.

The team also found that, according to the Commission on Cancer registry, 44% of lung cancers in 2010 were not diagnosed until Stage 4 in the United States. “Based on our at-risk population, we felt like screening could detect lung cancer at an earlier stage,” says Mohan G. Kulkarni, MD, a thoracic surgeon affiliated with Henry Ford Allegiance Health in Jackson and the physician co-chair of the lung disease site team. “As a result, we can intervene at a point where we can impact the course of the disease and save lives.”



Results from the clinic demonstrate that when care partners, like Mohan G. Kulkarni, MD, a thoracic surgeon affiliated with Henry Ford Allegiance Health in Jackson, partner with radiologists and administrators, lung cancer can be detected more often, and at earlier stages.

“We can intervene at a point where we can impact the course of the disease and save lives.”

—Mohan G. Kulkarni, MD

With recognition of both need and opportunity, Parikh and Kulkarni came together with other clinicians and administrators from Henry Ford Allegiance Health to form the lung cancer screening program. Karen Yacobucci, administrative director of Henry Ford Cancer Institute (HFCI), Central Region, was the force behind the successful execution of the program.

Putting Ideas into Action

When the group started its program in 2015, CMS was not yet covering lung cancer screening, so an important first step in establishing the screening clinic was to find funding to cover the cost for patients. “Immediately recognizing the clinic’s life-saving potential, the

health system created a fund with a contribution from The Tony Open, a local charitable foundation seeking to make a difference in the community, to pay for lung cancer screening for qualified patients who couldn’t afford it,” Parikh says.

After lining up funding, the team began actively implementing the lung cancer screening program, including finding space for the clinic and securing dedicated time to use the CT scanner. Parikh met with his radiology group partners and proposed that he would schedule a block of time each week for lung cancer screening patients. With their support, he schedules one morning a week, from 7 a.m. to noon, for the clinic.

Next, he approached Yacobucci and other administrators and requested the same dedicated time to use the CT scanner for lung cancer screening. He also asked for a place to meet with patients to discuss their scans and findings. “I need that dedicated space and time, because I want to speak with every patient,” Parikh says. “The hospital administrator looked at the NLST trial data and our demographics and realized it was the right thing to do for our patients.”

Other care partners agreed that the face-to-face conversations between the patient and radiologist were critical to the program’s success. “Dr. Parikh is not a typical radiologist who spends most of his time in the dark reading images and creating reports,” Kulkarni says. “He wants to have patient interactions to ensure anxious patients with potential findings of lung cancer don’t leave without having a clear understanding of what comes next.”

Breaking Down Barriers

To make the program work effectively, Parikh and the team focused on eliminating potential hurdles for both patients and referring physicians. For patients, the screening clinic provides an easy and seamless pathway from undergoing the initial CT and receiving tobacco counseling to reviewing results of the scan and ordering follow-up imaging and scheduling appointments.

Here’s how the process works: When a patient comes in for screening, a technologist conducts the scan, and then the patient goes to see Carol Zawacki, RN, LMSW, a certified

tobacco treatment specialist and health educator, while Parikh reads the scan. “I didn’t want patients to have to come back for separate tobacco counseling,” Parikh explains. “The goal is to have everything happen on the same day, which encourages people to get the follow-up care they need.”

Zawacki says that in-person counseling and treatment is the most effective for facilitating tobacco cessation. “I talk briefly with patients about their relationship with tobacco: the physical addiction, plus the psychological, emotional, social, and behavioral aspects,” says Zawacki, who was invited to join the screening team based on her ongoing efforts to counsel lung nodule patients about smoking cessation. “Most people have tried to quit. Most want to quit. I’m a resource to offer support, empathy, understanding, and education.”

Evidence shows that patients have a 50% greater chance of quitting smoking when they combine some type of counseling with a nicotine replacement therapy or medication.⁴ “While patients are here, I can submit an order for that treatment and then follow up with them afterwards about other support they need to quit,” Zawacki says.

The data shows this on-the-spot tobacco counseling is working. The overall smoking cessation rate for patients in the lung cancer screening program has gone from 13% in 2016 to 15% in 2017. Even better, the quit rate for screening patients with negative screening results increased from 8% in 2016 to 14% in 2017. According to Parikh, these results can be attributed to Zawacki’s direct interaction with patients as a tobacco cessation counselor.

Empowering Patients

By the time a patient has finished speaking with Zawacki, Parikh has read the scan, compared it to previous scans, and applied the ACR LUNG-RADS® lexicon. (View the lexicon at bit.ly/ACR_LungRADS) The patient then joins Parikh and Christi Bartlett, RN, BSN, the screening program’s nurse navigator, in the reading room, where Parikh reviews the images with the patient.

In these shared decision-making consultations, Parikh orients the patient with the anatomy, identifies any nodules, and describes the findings. Each consultation takes 5



Carol Zawacki, RN, LMSW, a certified tobacco treatment specialist, counsels patients on smoking cessation while the radiologist is reading the scans.

“I talk briefly with patients about their relationship with tobacco: the physical addiction, plus the psychological, emotional, social, and behavioral aspects.”

– Carol Zawacki, RN, LMSW

to 15 minutes, depending on how many questions the patient has for Parikh. Every patient leaves the clinic with exam results in hand.

In instances in which the findings are negative, Parikh stresses that, while there is no indication of lung cancer, patients are still at high-risk for developing the disease and should quit smoking. Bartlett makes an appointment for annual screening and reinforces that patients should keep returning to ensure they have a chance to catch developing lung cancer early.

From there, Kayla Brow, lung program

coordinator, monitors annual screening patients. Brow enters and tracks all results within the EMR’s lung screening dashboard and the HFCI database to ensure that patients have follow-up appointments within the appropriate timeframe. Brow also generates and mails reminder letters to each lung screening patient one month prior to their recommended screening. Before any new or returning patients are scheduled into the lung screening block, Brow verifies the order, reviews the chart to ensure the patient meets CMS criteria for lung cancer screening, and then reaches out to the patient to schedule the exam.

When the findings are suspicious, Bartlett, who is also the lung nodule nurse navigator, contacts the referring provider for appropriate follow-up based on LUNG-RADS. She also facilitates orders for Henry Ford Allegiance physicians to co-sign, ensures proper order authorization, and schedules follow-up appointments — most within 14 days. For outside physicians, Bartlett contacts the physician’s office with results and recommendations, then watches to ensure an order for follow-up imaging is placed.

For patients with findings that require follow-up, Bartlett stays in close touch to ensure they get the recommended scans. “I reach out to them by phone,” she says. “I call three times, and if I haven’t spoken with them, I send a certified letter about the importance of keeping their appointments. That’s when many people realize it’s serious, and they need to come in.”

Bartlett also reports back to those patients’ referring physicians, letting them know what’s happening and what exams and appointments have been scheduled. “Our ordering physicians find it reassuring that our clinic is facilitating all of it. As a result, the referring physicians are more inclined to encourage their patients to come for screening, so everybody wins.”

Patients are also comforted to know that Bartlett is there to assist them through the screening process and that they can always reach out to her with questions. “It makes all the difference having someone there for the patients to guide them through and make sure nothing is overlooked,” Parikh says. “Our patients know someone is watching out for



For patients with suspicious findings, nurse navigator Christi Bartlett, RN, BSN, obtains authorizations and often schedules follow-up procedures before the patient even leaves the clinic.

them behind the scenes. It's reassuring when they know the order has been placed for them before they even leave the clinic."

Finding Cancer Earlier

Based on the clinic's efforts to make screening as easy as possible for patients and referrers, it is making inroads in its goal of catching lung cancer early. "One thing we're all concerned about is missing cancer until it's too late, when the treatment is harder and the prognosis is worse," says Kulkarni. "We tried to come up with a program to capture people before they come in with advanced disease. Our goal is to find cancers at an earlier stage and get that intervention, so we can save more lives."

The results of the lung cancer screening program speak for themselves. Since the program began, the team has seen nearly 2,500 patients and has found a total of 53 cases with pathologically proven lung cancer at all stages. The program has also detected nine other potentially deadly cancers, including esophageal, kidney, adrenal, transverse colon, abdominal, and lymphoma.

In 2018, the cancer detection rate for the lung cancer screening program was nearly 3%. And the incidence of Stage 4 cancer was just 36% in 2018 as compared to the national average of 44%. "Many times, our patients think that when we catch cancer, it's too

"Our goal is to find cancers at an earlier stage and get that intervention, so we can save more lives."

—Mohan G. Kulkarni, MD

late," says Bartlett. "But if we catch it when it's small, it's not too late. We just need to get you in here, get you checked, and watch out for you. We can make a difference."

With their strong record of success, the team is now focused on getting even more patients in for lung cancer screening. "We are all passionate about reaching out to our community — especially the lower socioeconomic population where smoking is more prevalent — and encouraging people to get the screening that can save their lives," says Parikh.

To that end, Parikh asks patients to share their screening experiences with their families and friends — knowing that people who smoke usually know others who smoke. The team also conducts outreach at events, like Rotary or Lions Club meetings, and at the county fair, parades, festivals, health fairs, and industrial parks, as well as at the hospital's annual "Shine a Light on Lung Cancer" event.

Additionally, the team regularly visits medical practices and referring physicians whose patient populations include a high number of smokers to provide education and promote the screening program. "People are starting to realize that every time a patient comes in for a physical, their doctors need to look into their smoking history and promote lung cancer screening," Parikh says.

Kulkarni believes that having a collaborative team of people who believe in the power of lung cancer screening is the most important factor in the success of their program. "When you have buy-in from administration along with dedicated clinicians and a forward-thinking radiologist coming together with a focus to improve care for a particular cancer, miracles can happen," he says. "The evidence shows that we can have an impact when we work together."

By Linda G. Sowers

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Next Steps

- Review findings directly with patients and recognize that LDCT for lung cancer screening is a teachable moment for smoking cessation.
- While patients are in the clinic, order scans and set follow-up appointments to encourage patients to continue screening or treatment and take the burden off of referrers.
- Focus on patient outreach and engagement. Identify a strategy to reach the highest-risk patients, including those in lower socioeconomic groups.



Lung Screening in an Urban Setting

Radiologists in the Bronx lead a lung cancer screening program targeting an underserved, high-risk urban population.

KEY TAKEAWAYS:

- Inspired by the results of the National Lung Screening Trial, physicians at Montefiore Health System collaborated across disciplines to develop a lung cancer screening program to reduce mortality rates in their high-risk population.
- Screening program directors meet regularly with referring physicians throughout the hospital network to raise awareness and build trust.
- With automated enrollment forms and follow-up reminders in the EMR system, the screening program reduces the burden of patient management for referring physicians.



PHOTO COURTESY OF MONTEFIORE HEALTH SYSTEM

Linda B. Haramati, MD, MS, FACR, director of cardiothoracic imaging, and Andrea C. Furlani, MD, a cardiologist and future radiologist, review a chest scan at Montefiore Health System.

David Feliciano's friend went to the doctor for what he thought was just a cough, but imaging revealed something much more serious: Stage 4 lung cancer. "By the time he finally got his lungs checked, it was too late, and four months later, he was gone," Feliciano says.

Feliciano, himself a former smoker, learned a valuable lesson from his friend's results: Lung cancer typically doesn't present symptoms until the advanced stages, when the disease is more difficult to treat and nearly impossible to cure. "You don't want to wait until you have symptoms to find out you need treatment. You want to catch it right away," says Feliciano, who smoked for 40 years. "That's why I get checked every year."

When it comes to lung cancer, early detection is lifesaving. Three-fourths of lung cancer cases aren't diagnosed until the disease has spread, reducing the five-year survival rate to just 5%.¹ But if lung cancer is

detected early, the five-year survival rate can be as high as 90%.² Lung cancer screening programs, like the one Feliciano is enrolled in at Montefiore Health System in New York, aim to increase survival by catching lung cancer early.

"We have systems like mammography to detect breast cancer and colonoscopy to detect colon cancer, but lung cancer always lacked a screening pathway until we introduced low-dose CT (LDCT)," says Chirag D. Shah, MD, director of the pulmonary and critical care fellowship at Montefiore. "With a framework for lung cancer screening, we can really impact patient care."

Montefiore is located in the Bronx, which has the second-highest smoking rate of New York City's five boroughs. The hospital's screening program targets an ethnically diverse, underserved urban population at high risk for lung cancer. Since Montefiore's program launched in December of 2012, the



Linda B. Haramati, MD, MS, FACR, director of cardiothoracic imaging at Montefiore, led implementation of a successful lung cancer screening program at Montefiore Health System.

“Even with limited resources, screening programs can still improve patient care.”

—Linda B. Haramati, MD, MS, FACR

system’s radiologists have screened more than 2,200 patients and detected 55 cancers — about half of them Stage 1 and 2 lung cancer.

“Early stage disease is the most likely to be cured,” says Linda B. Haramati, MD, MS, FACR director of cardiothoracic imaging at Montefiore, who spearheaded the program’s development. “By participating in a screening program, people with a smoking history have an opportunity to get ahead of lung cancer and seek life-saving treatment.”

Support for Screening

In 2011, the National Cancer Institute published the findings of the National Lung Screening Trial (NLST), which established the evidence to support lung cancer screening. (Learn more at bit.ly/Lungtrial) The results revealed that annual LDCT screening could lead to a 20% reduction in lung cancer mortality rates, compared to standard chest X-rays.³

Around the same time, the Centers for Medicare and Medicaid Services selected Montefiore as one of 32 Pioneer Accountable Care Organizations (ACO). (Learn more at bit.ly/CMS_ACO) Under this model, Montefiore focused on providing enhanced care coordination and illness prevention for Medicare beneficiaries, so its administrators instantly saw the lung cancer screening program as a way to meet these goals and improve patient outcomes related to lung cancer. “Montefiore had just become an ACO, so it was a propitious moment to get everyone on board with a program like this,” says Haramati, who has a joint appointment in the department of medicine.

With the goal of developing a lung cancer screening program, Montefiore’s head of pulmonary medicine initiated the first meeting among physicians from the surgery, oncology, radiology, and radiation oncology departments. Although all of the physicians supported the idea of lung cancer screening, the radiologists took the lead, sharing the NLST data and other screening information with their colleagues.

“The strong body of evidence supporting lung cancer screening generated a lot of enthusiasm among participants,” says Haramati, who’s also a professor of radiology at Albert Einstein College of Medicine. “But we knew from mammography that image-based screening has to be done right to be effective. We’re not doing diagnostic imaging; we’re screening healthy people, so we had to find a way to target and track eligible patients. Instead of starting from scratch, we decided to apply the lessons we learned from mammography to make this program successful as a radiology-centered service.”

Initial Resources

In modeling the lung screening program after mammography, Haramati and the multidisciplinary committee identified three key resources they needed to launch the initiative: a special order in the electronic medical record, a system to report results consistently, and a coordinator to manage patients and data.

“First, we wanted to make sure that we screened only eligible patients, which at the time were current and former smokers

between the ages of 55 and 74 with a smoking history of at least 30 pack-years,” Haramati says. “The only real resource we needed from administrators was a special order in our electronic medical record to enroll patients who met the eligibility criteria. They bought into it because the evidence showed that lung cancer screening would benefit patient care.”

With approval for the special order, Haramati developed an intake questionnaire to ensure that patients referred into the program met the screening criteria. She worked with the EMR’s tech team to set up the special order so that when referring physicians enrolled patients, the questionnaire popped up automatically to confirm their eligibility.

Next, Haramati turned her attention to developing a consistent method for reporting results. Since standardized guidelines for lung cancer screening did not yet exist, Haramati met with the chief of mammography to develop guidelines based on BI-RADS® — and then switched to LUNG-RADS when the ACR published its first set of guidelines in 2014. (Learn more at bit.ly/ACR_BIRADS and bit.ly/ACR_LungRADS)

To schedule exams and manage follow-up appointments, the screening program needed a dedicated bilingual coordinator. The radiology department agreed to move a half-time clerk into the role. The coordinator, Aracelis Jimenez, now a pillar of the program, called new patients to confirm



Anna Shmukler, MD, a radiologist at Montefiore and co-director of the lung screening program, has been integral to the program’s outreach.

that they met eligibility requirements before scheduling exams, and then manually tracked their results and follow-up recommendations with assistance from medical students and residents, including Hannah Milch, Mark Kaminetsky, Abraham Kessler, Robert Peng, and Edward Mardakhaev.

It took the committee about a year to gather these initial resources. Montefiore screened its first patient in December of 2012.

Patient Enrollment

As the program got underway, the committee's biggest concern was enrolling patients. They worried because Montefiore's patients differ dramatically from the NLST population. "The majority of patients in the trial were more affluent than our patients in the Bronx — most of whom come from low socioeconomic backgrounds and have limited access to healthcare," explains Anna Shmukler, MD, a radiologist at Montefiore and co-director of the lung screening program.

With CMS' coverage determination still a few years away, Montefiore had to consider the cost of screening for its underserved patient population. (Read the determination at bit.ly/CMSDecision) "We're the poorest county in New York's 62 counties," Haramati says. "Hospitals in Manhattan were charging between \$400 and \$700 per scan, but if our patients had to pay that much for exams, it would have been a huge burden on them. So, if their insurance company wouldn't cover it, we charged a reduced rate of \$75."

Even with the relatively low cost, the team worried about convincing patients to join the program. "We were concerned that we'd be catching the disease at a later stage because our patients tend to seek medical care only after they're already symptomatic," Shmukler says.

Haramati knew the best way to reach high-risk patients early was through their primary care physicians (PCPs). With this in mind, Montefiore's radiologists began reaching out to referring clinicians about the screening program. When PCPs ordered CT scans for patients with emphysema or a history of smoking, for example, Shmukler would call them back and explain how to enroll these high-risk patients into the new screening program.

"If the screening order makes it simple and

practical for referring physicians to ask the right questions to determine who's a good fit for a CT scan, you'll end up with a more consistent program," Shah says. "Patients are going to be skeptical, so equipping their PCPs to explain the program face-to-face can build trust and confidence."

When his PCP explained that screening could detect lung cancer early enough for treatment, Feliciano agreed that an annual scan was important. He had his first exam in 2016 and hasn't missed his annual visit since. "My doctor is always telling me we've got to nip it in the bud," says Feliciano, 65. "So it's good to have this exam done once a year because of the amount of time I smoked."

Initially, some referring physicians, like Shah, worried about the amount of paperwork and patient management the program added to their already heavy workloads. "I had to keep a list of all my patients who were getting screened, and then try to track them down when it was time for their next screen," Shah explains. To overcome these concerns, the screening program needed more robust resources.

Added Resources

The first upgrade came in 2015, when Montefiore adopted a new EMR that allowed for a more automated enrollment process to help referring physicians order screening exams and track follow-up recommendations. The second boost came in 2017, when renowned abdominal radiologist, Judy Yee, MD, FACR, became chair of the radiology department.

"Dr. Yee is a big advocate for image-based screening, so even before she joined Montefiore, she met with me to discuss the need for additional resources in the lung cancer screening program," Haramati says. "After Dr. Yee started in her new role, one of the first things she asked for was a nurse practitioner to serve as a clinical coordinator for our program."

Yee partnered with the chair of radiation oncology and the director of the Montefiore Einstein Center for Cancer Care, who each agreed to fund half of the coordinator's salary. In 2018, Maria Serrano, ANP-BC, AOCN, who had more than 20 years' experience as a nurse practitioner at Montefiore, joined



Judy Yee, MD, FACR, radiology department chair at Montefiore, is a big advocate for lung cancer screening.

the program as clinical coordinator. "We were lucky to get one of the most experienced nurse practitioners in our institution," Haramati says. "She has experience in thoracic surgery and oncology and knows many of the referring physicians throughout the institution — personal relationships that are extremely beneficial to our program."

Leveraging her relationships with referring clinicians, Serrano expanded the screening program's outreach efforts. She and Shmukler began visiting primary care sites throughout the system to present the lung cancer screening program in weekly meetings and grand rounds, emphasizing that the program adds little work for referring physicians. "Some referring physicians were reluctant because they're already overwhelmed with paperwork," Haramati says. "With our clinical coordinator, we have the resources to unburden them of some previous barriers to referring patients."

Shared Decision Making

Serrano and Shmukler also explain that referring physicians can decide how much of the process they want to oversee. When ordering a screening exam, referring physicians can opt to either order a lung cancer screening CT for a patient they've already met with to discuss the benefits and potential risks of screening, or they can order a shared

PHOTO COURTESY OF MONTEFIORE HEALTH SYSTEM



Maria Serrano, ANP-BC, AOCN, Montefiore's lung cancer screening program clinical coordinator, leveraged her relationships to expand the program's outreach.

decision-making session with the program's clinical coordinator.

Regardless of which option the referring clinician chooses, the screening staff receive automated pop-up alerts, letting them know that a referrer wants to schedule an exam. From there, they call patients to ensure they meet the screening criteria (which now aligns with CMS) before scheduling an appointment for either the exam or a shared decision-making session with Serrano. (See the CMS guidelines at bit.ly/lungeligibility)

During the shared decision-making session, as required by CMS before patients are screened, Serrano explains the risk factors for lung cancer and describes what patients can expect during and after the exam. If the patient decides to proceed with screening, Serrano then orders the LDCT.

Results Reports

After a patient undergoes a screening exam, one of Montefiore's six chest radiologists interprets the scan, generally within 24 hours, and the EMR automatically generates a letter to the patient and the referring physician outlining the results. Serrano explains to patients ahead of time that if their results are normal (LUNG-RADS-1 or LUNG-RADS-2), the letter

will simply say, "We are pleased to inform you that the results of your recent lung cancer screening imaging are normal. See you next year," and they'll get a reminder to schedule their annual exam 12 months later.

If the results are more suspicious (LUNG-RADS-3 or LUNG-RADS-4), Serrano follows up with a phone call to both the patient and the referring physician and urges patients to discuss the results with their ordering doctor. For LUNG-RADS-3 results, the radiologists typically recommend follow-up scans in six months. They send Lung-RADS-4 results to Montefiore's weekly multidisciplinary tumor board for discussion.

Since Serrano used to head the tumor board when she worked in thoracic surgery, she takes the lead presenting abnormal lung screening results every week. "We can escalate cases so other departments can expedite the patient referral," Serrano says. "It helps facilitate patients getting appointments much sooner, usually within a week."

Growth Goals

With robust resources now in place, Montefiore's lung cancer screening program is poised for steady growth, with two main goals: capture more eligible patients and ensure that enrolled patients return annually. "Ideally, we want 90% compliance with follow-up recommendations, and we've been hovering around 50%. Some patients come back late — 18 months or two years later, instead of annually. Some of them drop out of the system because they got one normal result and decided that's good enough," Haramati says. "It's one of our major priorities to improve that compliance."

The screening team is increasing its outreach and follow-up with physicians to bring more eligible patients into the program and increase compliance. It recently started working with Montefiore's public relations department to coordinate marketing emails, symposiums, billboards, and press coverage to raise awareness about lung cancer screening, while Serrano and Shmukler continue to meet with local medical groups to promote the program. "Informing physicians about the large body of evidence is important," Shmukler says. "We emphasize that lung cancer screening saves lives to help them

understand how beneficial this program can be for their patients."

As Montefiore's program continues to grow, it models how effective lung cancer screening can be — even in the inner-city. "There are many resource-poor areas where lung cancer screening can be developed to benefit patients and save lives," Haramati says. "Even with limited resources, screening programs can still improve patient care."

For patients like Feliciano, a quick annual exam is a small price to pay for peace of mind. "Hopefully I never develop lung cancer," he says, "but if they do find something, at least they can find it early enough to start treatment."

By Brooke Bilyj

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Next Steps

- Develop a lung cancer screening order in your EMR to automate enrollment for high-risk patients, reducing the administrative burden for referring physicians.
- Dedicate the clinical personnel to take responsibility for patient and data management and outreach to referring physicians.
- Collaborate with a multidisciplinary team of experts to discuss abnormal screening results and expedite patient follow-up.



Lung Screening Solutions

North Dakota radiologists collaborate with referring physicians to administer lung CT screening for high-risk patients.

KEY TAKEAWAYS:

- As part of a multidisciplinary team, radiologists manage lung CT interpretation and nodule recommendations for a high-risk screening program.
- Through referring physician education about lung CT screening, Sanford Medical Center was able to treat cancers earlier and improve public health.
- Through lung nodule meetings and a dedicated lung nodule clinic with a nurse navigator, the team centralized a complex screening process for improved patient management.

When radiologists at Sanford Medical Center in Fargo, N.D., heard about their hospital's plan to offer low-dose CT (LDCT) lung cancer screening for high-risk patients in 2012, they were a bit apprehensive. The radiologists knew that lung cancer screening would require a great deal of coordination and were concerned about the time and complexity associated with monitoring patients who enrolled in the program.

"We recognized the immense potential of screening to identify lung cancer in the early stages, when it's most treatable. But without the right follow-up procedures in place to make sure no one fell through the cracks, we thought we'd actually be doing our patients a disservice," says Martha S. Kearns, MD, radiologist at Sanford Medical Center Fargo.

To ensure lung cancer screening patients would receive the necessary longitudinal care, the radiologists partnered with a multidisciplinary team of primary care and internal medicine physicians, nurse navigators, pulmonologists, radiation oncologists, and oncologists to establish a dedicated lung nodule clinic to track and monitor lung cancer screening patients.

Now, with a dedicated nurse navigator, the team manages patient exams, results communication, and follow-up, with radiologists providing clear and consistent recommendations based on custom guidelines that the radiologists founded in part on the ACR LUNG-RADS reporting system. (Learn more in the "Managing Nodules" case study at [bit.ly/ManagingNodules](#)) With this approach, Sanford's lung cancer screening program has grown significantly over the years.

Since the program began in 2013 — with a hiatus in 2015 for proposed Medicare changes — over 300 different providers throughout the region have referred more than 3,900 patients for lung cancer screening. Among these patients, the radiologists have identified 44 cases of cancer, 24 of which were detected in Stages 1 and 2, when the disease is still treatable.



Martha S. Kearns, MD, radiologist at Sanford Medical Center Fargo, led implementation of the hospital's lung cancer screening program, which has served nearly 4,000 patients.

"Working closely with family physicians and other key specialists, we've been able to detect lung cancer early, before symptoms even appear," Kearns explains. "Lung cancer screening is part of our role as radiologists now, and it saves lives."

Starting the Program

The idea to start a lung cancer screening program at Sanford Medical Center began during a 2012 lung care oversight committee meeting, when administrators asked physicians an important question: What can our cancer center do to elevate its performance? Radiation oncologists and oncologists at Sanford's Roger Maris Cancer Center noted an uptick in the number of lung cancer patients they were seeing and suggested that lung cancer screening could help detect cancer cases sooner, while also bringing more patients to the center.

They pointed to the National Lung Screening Trial (NLST), which found that patients who underwent annual LDCT screening had a 20% lower lung cancer mortality rate compared to those screened with chest X-rays.¹ (Learn more about the trial at bit.ly/Lungtrial) One of Sanford Fargo's sister locations in Sioux Falls, S.D., had recently launched its own lung cancer screening program. "We knew that if we were going to keep up with other health systems and better serve patients, we had to start our own screening program," says Sharri M. Lacher, APRN, who eventually became the program's lung nodule nurse navigator.

As the lung care committee considered starting a lung cancer screening program, members evaluated Sanford's existing CT technology for LDCT calibration and agreed that patients would need a referral from their primary care physicians (PCPs) to enroll in the program. They also decided on both the eligibility requirements and a self-pay fee of \$150 for patients, since lung cancer screening had not yet been approved for insurance reimbursement.

The team's use of existing CT equipment and exam space kept the program's operating costs low. Given the program's minimal overhead — and high potential for patient benefit — hospital administrators wholeheartedly endorsed launching the screening program for high-risk patients in March of 2013.

Working with Referrers

Referrer involvement was critical to generating a steady volume of eligible screening patients. Unfortunately, many PCPs and other family physicians did not understand the significance of the landmark NLST or the potential benefits of lung cancer screening for high-risk populations. To overcome this, Sanford specialists partnered with Lacher to educate referrers across the region about screening and to encourage them to enroll patients in the program.

Lacher planned monthly lunch and learns for physicians and nurses. During the events, Lacher and physicians from radiation oncology and oncology emphasized the importance of documenting patients' smoking histories to identify probable screening candidates and encouraged referring physicians

to inform patients about the benefits of and need for LDCT screening: It helps detect lung cancer early, when it's still treatable and is recommended for as many as 15 years after a patient quits smoking. Sanford also integrated a flagging system for LCS eligibility within the electronic medical record (EMR) so physicians could more easily identify high-risk patients.

The lunch and learns also gave referring physicians an opportunity to ask questions and voice their concerns. Some referring physicians worried that the radiologists wanted to commandeer their patients. But Kearns and Lacher assured them that the goal was to work collaboratively to provide this enhanced patient care. "We were really saying to them 'Let us help you help your patients; let us help you do your job better and make sure your patients get the care they

monitoring patients through the continuum of care as part of the lung nodule clinic. "If patients had abnormalities, like a lung mass, we agreed to help primary care triage them to pulmonology or interventional radiology or send them for subsequent CTs — wherever the patients needed to go," Kearns says. "We became a safety net to make sure the patients were being taken care of, so the primary physicians had one less thing to worry about."

Meeting CMS Requirements

While the self-pay model brought in a moderate but steady stream of over 200 patients in 2014, 2015 was a different story. In February of that year, CMS announced a national coverage determination for Medicare beneficiaries who meet certain eligibility criteria.³ The decision also outlined specific dose parameters,

"We knew that if we were going to keep up with other health systems and better serve patients, we had to start our own screening program."

— Sharri M. Lacher, APRN

need," Kearns explains. "We assured them we weren't trying to steal their patients."

The outreach educated referring physicians about the benefits of lung cancer screening. "We understood that if a patient had at least a 25-year smoking history, we'd send them for screening to catch nodules earlier and potentially save lives," says David Glatt, MD, chair of the department of family medicine at Sanford Health.

Still, many PCPs felt ill-equipped to manage the increasing volume of lung nodule patients that screening would identify. "We were concerned we were going to lose patients to follow-up," Glatt explains. "As far as we were concerned, radiologists and pulmonologists were the nodule experts and had a much better understanding for where the patients should go next."

Radiologists, who had similar concerns about patient follow-up, committed to



Sharri Lacher, APRN, clinical nurse specialist in Sanford's lung nodule clinic, helped spread the word about the benefits of lung cancer screening for qualifying patients.

standardized reporting requirements, and other conditions for reading radiologists and participating imaging facilities. Sanford's screening program — like other lung cancer screening programs nationwide — was suspended until it met the new requirements and CMS finalized its reimbursement codes.

From there, Sanford began implementing new processes to meet the CMS requirements for lung cancer screening, including the institution of dose reduction techniques as part of the ACR Lung Cancer Screening Registry (LCSR) and patient flow improvements within the lung nodule clinic. (Learn more about the registry at bit.ly/ACR_LCSRRegistry) The on-staff radiologist would interpret the CT, share the standardized report with both the PCP — who would deliver the results to the patient — and Lacher, who, as the nurse navigator, would monitor the patient to ensure care continuation for subsequent scans.

According to Glatt, this coordinated care delivery has been vital to the screening program's success. "Centralizing the complex, multidisciplinary process of CT screening and subsequent lung nodule management into a clinic has enabled Sanford to provide true accountability and the highest level of patient care for thousands of patients."

Expanding the Reach

The referrer education outreach efforts along with integration of LCS eligibility within the EMR spurred a significant increase in the program's patient volume. After Medicare reimbursement for lung cancer screening was approved in late 2015, the year brought 466 patients into the program, followed by 681 patients in 2016.

As the program gained momentum, Lacher and Kearns began helping rural Sanford sites in the region adjust screening processes to meet Medicare's requirements for a covered LDCT program and participation in the ACR LCSR. "I've met with various leaders of rural clinics to discuss what we've implemented here at Sanford and to help guide them in offering screening and follow-up access for high-risk patients in rural areas," Kearns says.

Sanford Medical Center's lung cancer screening volumes have continued to

increase with its expanding presence in the region and within referrers' offices, with 1,211 high-risk patients undergoing screening in 2018. Over the duration of the program, numerous lung cancers — 24 of them early stage — as well as additional cancers, were identified in 44 patients, increasing their chances of survival via various treatments.

For 2019, the Sanford lung nodule clinic has set a new goal: a 20% increase in scans to induce earlier nodule detection and successful treatment for at-risk patients. Lacher believes that into the next decade the lung cancer screening program could grow through the use of videoconferencing and/or even a mobile screening unit to service additional areas.

Kearns says that the program's success can be attributed in part to radiology's consistency in process, open-mindedness about applications, and a willingness to be hands-on in a way that demonstrates the specialty's value. "Lung cancer isn't going away," she says. "As radiologists, it is our job to find it early, so we can reduce mortality, and lung cancer screening is the best way for us to do that."

By Kerri Reeves

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Next Steps

- Approach administrators with detailed findings of high-risk CT screening benefits, making a business case for treating lung cancer earlier for improved outcomes.
- Meet with potential referring physicians in your region to educate them about lung screening, the need for a dedicated program, and how radiologists can lead the effort to ensure continuity of care for at-risk patients.
- Access lung cancer screening resources to determine your ability to meet established criteria for the LCSR, creating an action plan for achievement. (See the resources at bit.ly/ACRLCSResources)

"There's a lot of stigma about people who smoke, and a misconception that they caused their own disease so they don't deserve to get screening."

— Andrea Borondy Kitts, MS, MPH,
"Clearing the Barriers" in the
August 2019 issue of the *ACR Bulletin*





Actions for Implementing a Lung Cancer Screening Program

Understand the need for screening in your area

Research smoking statistics in your community:

- What percentage of area residents smoke?
- What are the demographics of smokers in your area?
- What percentage of lung cancers in your area are currently diagnosed at a late stage?

Identify your internal resources

Collaborate with clinical programs:

- Primary Care
- Pulmonary Medicine
- Interventional Pulmonary
- Medical Oncology*
- Thoracic Surgery*
- Radiation Oncology*
- Pathology
- Tumor board and/or lung nodule committee

(*If no onsite oncology, thoracic surgery, or radiation therapy exists, identify a regional center for referrals.)

Engage with important institutional partners/allies/departments:

- Scheduling Coordinators
- Admissions Specialists
- CT Technologists
- Informaticists
- Health Information Management
- PACS Experts
- EMR Specialists
- Finance Utilization Management
- Marketing/Web Team



Select a program structure

An LCS program structure will depend on the type of institution, available resources, and the specialty and/or population of the practice. Learn more at bit.ly/LCSImplementationGuide

- Centralized LCS Program
- Decentralized LCS Program
- Hybrid LCS Program–Decentralized Access/Centralized Tracking Model

Establish a program framework

Ensure you have the right team and processes in place

- The ACR Lung Cancer Screening Registry™ (LCSR) is currently the only CMS-approved Qualified Clinical Data Registry that enables providers to meet quality-reporting requirements for receiving Medicare CT LCS payment
- Decide which radiologists will read exams and train them to read screening exams
- Apply for ACR CT Accreditation
- Adopt a structured reporting system, such as LUNG-RADS
- Develop a process for managing incidental findings
- Create a system for notifying patients of results
- Identify process/person for reporting data to ACR Registry
- Identify process to gather program metrics

Involve a smoking cessation counselor in the program

Develop a process for patients to see the counselor at the time of screening:

- Smoking cessation is a key component of a comprehensive lung cancer screening program
- Track the impact of counseling over time to measure the smoking cessation rates

Hire a nurse navigator/program coordinator or borrow time from an existing research program coordinator, navigator, or nurse to manage longitudinal patient care

Consider someone with experience in thoracic surgery, oncology, or related specialty:

- Train the navigator/coordinator to confirm patient eligibility and schedule screenings
- Empower the navigator/coordinator to ensure patients receive the required screening and follow-up
- Involve the navigator/coordinator in program outreach and marketing efforts
- Provide referring physicians and patients with a direct phone number to reach the navigator/coordinator
- Allow the navigator/coordinator to deliver results to primary care and other referring physicians

Conduct marketing, outreach, and engagement among referring physicians and patients

Create educational and marketing material:

- Identify a strategy to reach out to the highest risk patients
- Use LCS as a teachable moment for current smokers about smoking cessation
- Collaborate with existing screening programs in your practice, such as mammography and colorectal screening, to schedule patients
- Understand and anticipate provider concerns (such as incidental findings management)
- Develop clinical relationships and workflows to review scan findings with patients

This action plan courtesy of the ACR Lung Cancer 2.0 Steering Committee.



Patient Forward

A multidisciplinary team invites patients and their families to a weekly thoracic oncology conference at Elkhart General Hospital.

KEY TAKEAWAYS:

- Leaders from radiology, cardiothoracic surgery, and other specialties involved in lung cancer screening and treatment at Indiana's Elkhart General Hospital partnered to create a multidisciplinary thoracic oncology conference.
- Patients and family members have a seat at the table, participating with doctors in their course of treatment.
- The hospital's cancer committee initiated the program to address a public health crisis involving the area's high percentage of smokers, as compared to the rest of Indiana.

As retired nurse Robyn Shank searched for the right place to begin her lung cancer treatment journey, she selected a place based on the experience of someone close to her. "When a close acquaintance was diagnosed with cancer, her community hospital in Tennessee had a tumor board where physicians reviewed patients' cases, and the patients were involved in the process," Shank says. "I wanted that same level of involvement in my cancer treatment program."

Shank, 59, searched the Internet and found Elkhart General Hospital's (EGH) multidisciplinary thoracic oncology conference. Started in 2012, the program incorporates low-dose CT (LDCT) technology for lung cancer screening and brings together all of the medical professionals involved in a patient's lung cancer treatment for weekly conferences with their patients. The lung cancer screening occurs first, and then the patient is referred to the thoracic oncology conference. (Read about Elkhart's lung cancer screening program in the "Breathe Easier" case study on page 8.)

Shank and her husband make the 45-minute drive from their home in Sturgis, Mich., to the hospital in Elkhart, Ind., to attend the conferences. Patients typically attend an initial conference immediately following their lung cancer diagnosis. Upon completion of their treatment plan, patients attend a second session, during which they see a comparison of their CT scans before and after treatment.

Inviting Patients

Held from 7 to 8 a.m. every Thursday, the conference's early hour doesn't deter participants from attending. Each session includes a team of physicians from thoracic surgery, radiology, interventional radiology, pathology, medical oncology, radiation oncology, and pulmonology, along with an oncology nurse practitioner. Other participants can include registered dietitians, registered



PHOTO COURTESY OF ELKHART GENERAL HOSPITAL

Lung cancer patient Robyn Shank and her husband, Fred, listen intently as Robyn's doctors discuss her CT scan and potential course of treatment as part of Elkhart General Hospital's Thoracic Oncology Clinic. The weekly conferences give patients and their family members a seat at the table to plan their care.

nurses, a research nurse, director of oncology services, case managers, physician assistants, cancer registrars, nurse navigators, and palliative care staff.

Most importantly, the patient is there with a family member, sitting at the head of a U-shaped conference table. This aspect of the program is so well-received that organizers had to limit the number of family members attending conferences. "With lung cancer management, patients are at the center," says Samir B. Patel, MD, FACR, founder and director of the value management program at Radiology, Inc., in Mishawaka, Ind.

Including families in these conferences improves the patient experience, he says. "No patient comes alone," Patel continues. "Lung cancer is a life-altering disease and, with that, patients want to have as many supporters with them as possible. It improves the experience for the patients to have family members with them, not only for support but also to listen and ask questions."

Addressing a Public Health Crisis

Patel is also a member of the EGH's board of directors. He and the interventional and diagnostic radiologists of Radiology, Inc., helped



Related Content

Patient Forward

Video: bit.ly/openingtopatients

establish the thoracic oncology conference at a time when the community was facing a significant public health issue.

According to the Centers for Disease Control and Prevention, Elkhart County, an area known for its recreational vehicle manufacturing industry, has a high percentage of smokers, compared to the rest of Indiana. In response, EGH's cancer committee, along with senior-level executives and administrative personnel, initiated efforts to address this crisis.

The cardiothoracic surgeons and radiologists teamed up to give multiple presentations to the hospital's senior leadership, presenting a vision for what would eventually become the thoracic oncology conference. The cardiologists were seeing patients who had heart disease, but many of their patients had similar risk factors for lung cancer. At the program's onset, the cardiologists were the greatest advocates for lung cancer screening.

With the introduction of LDCT technology, which reached Elkhart in 2012, the hospital felt comfortable launching the thoracic oncology conference. LDCT was a safe way to address the community health crisis involving heavy smokers.

"We had to weigh the risks of radiation dose versus the benefits of CT lung screening,"

says Albert W. Cho, MD, vice chair of radiology at Elkhart, who was also involved in the creation of the lung screening program. "We didn't want to expose patients to high doses of radiation for a screening exam. There needed to be a balance. The low-dose technology provided that."

Overseeing the Program

Leading the day-to-day operations at the conference is Jackie S. Lenfestey, MSN, FNP, APRN-BC, the program's point of contact for both physicians and patients. Within five days of a patient's CT scan, Lenfestey calls the patient to discuss the results and next steps.

"I tell patients that the goal of the clinic is to pull together all of the doctors and hospital personnel working on their case, to agree on the stage of their cancer, and to give the patient the best options for their treatment," she says. "Throughout the process, we keep the patient at the forefront of care."

Lenfestey also answers patients' questions. "The most frequent question I get is, 'Is it ok to ask questions?'" she says. "Patients are surprised that they, along with their family, can actively participate in the dialogue between the specialists and safely ask questions to better understand their cancer and options for management."

Developing a Treatment Plan

In addition to Lenfestey, interventional radiologists have a great deal of contact with the patients, providing minimally invasive options. With that level of involvement, Patel says interventional radiology is a key participant in the thoracic oncology program. Nearly all of the patients in the program have seen an interventional radiologist for procedures, such as image-guided biopsy, prior to their lung cancer diagnoses. Having a "familiar face" at the conference goes a long way to optimizing the patient experience.

One of the clinic's participating doctors, interventional radiologist Nazar H. Golewale, MD, receives a list of cases in advance of each weekly conference. During the conference, he posts the patient's images on a large screen and uses layman's terms to explain the anatomy. "In many cases, patients have never seen CT scans before attending one of the conferences," Golewale says. "You can talk about cancer and what it does to the body, but you really get a feel for it when you see the scans."

Shank doesn't shy away from the details of her disease and, in fact, relishes being closely involved in her treatment process. "Once doctors reviewed the CT scans with us, explaining everything we saw on the screen,



Doctors, nurses, and other hospital representatives meet weekly with lung cancer patients who are at the center of the thoracic oncology conference. They review CT scans, discuss treatment options, and study treatment effectiveness.

PHOTO COURTESY OF ELKHART GENERAL HOSPITAL

we came up with a treatment plan,” she says. “The doctors explained what the treatment would entail and, when they were done, asked if that was still the course I wanted to take. They took as much time as I needed to explain everything.”

Building a Strong Team

A cohesive staff is imperative to developing a multidisciplinary program like this. Organizing such a group can be challenging, though, as some physicians are employed by a hospital or multispecialty group, and other physicians work on contract. Such is the case at Elkhart, which contracts with Radiology, Inc., for its radiology services. The synergy between the interventional and diagnostic radiologists of Radiology, Inc., and their collaborative partnership with physicians in other specialties, is key to the success of the thoracic oncology program.

“We’re fortunate with our scenario, in that we take a collegial approach to problem-solving even though we come from different disciplines and are not employed by the hospital,” Cho says. “We discuss together what we need and how to get something done. It’s a win-win for us and the patients. And the hospital is addressing a health crisis in the community.”

Spreading the Word

As of January of 2016, 443 unique patients have been imaged through the lung cancer screening program, and 14 lung cancers were diagnosed as a result. All but one of these diagnoses included completed staging information, such as the extent of the patient’s cancer, the tumor size, and whether or not the disease had spread to lymph nodes or other organs in the body. All 14 patients went on to participate in the thoracic oncology conference.

The success of the lung cancer screening program and the thoracic oncology conference spreads mostly through a grassroots, word-of-mouth campaign. “I get phone calls from people who live an hour to an hour-and-a-half away,” Lenfestey says. “I talked to someone who heard about our program from someone at their church. People who have been diagnosed with lung cancer are hearing

“We’re fortunate with our scenario, in that we take a collegial approach to problem-solving even though we come from different disciplines and are not employed by the hospital.”

—Albert W. Cho, MD

about our program through the community, and they want to come to Elkhart for their treatment and to be a part of the program.”

Cho is encouraged to see patients interested and involved in their own care, instead of being passive recipients of it from their doctors. When the lung cancer screening program started at Elkhart General, it was important to allow patients to self-refer into the program. Because cost could be a barrier for some patients, program organizers sought and received a grant from Elkhart General Hospital’s foundation to cover the cost of scans for low-income individuals.

Eliminating Stigma

Involvement in the thoracic oncology conference not only helps patients learn more about their disease and treatment plan, but also gives them a place where they feel they can openly discuss their condition, sharing their fears and concerns. Lung cancer patients are often hesitant to discuss their disease, more so than patients with other forms of cancer, Lenfestey says. There’s a certain stigma

associated with the disease, with patients often feeling like this is something they brought on themselves through lifestyle choices.

For Shank, however, talking about her disease was a no-brainer. “My mother was a school teacher, so I think it’s up to me to teach everyone how good a program like this can be,” Shank says.

By Kathy Knaub-Hardy

Next Steps

- Bring together physicians from multiple disciplines throughout the hospital to share knowledge and best practices with each other and with hospital administration.
- Once the program is established, maintain patient data not only for reporting purposes, but for use in presentations at medical meetings where the program’s benefits can be promoted.
- Incorporate LDCT imaging into the program to reduce the risk-to-benefit ratio for lung cancer patients.



Interventional radiologist Nazar H. Golewale, MD, prepares to present patient Robyn Shank’s lung CT during a conference with Shank and the other physicians and medical staff involved in her treatment at Elkhart General Hospital.

PHOTO COURTESY OF ELKHART GENERAL HOSPITAL



Screen Time

The nation's flagship military hospital has developed an effective lung cancer screening program for the Department of Defense.

KEY TAKEAWAYS:

- Walter Reed National Military Medical Center's radiology team worked with a multidisciplinary group to develop a lung cancer screening program for military service members and other beneficiaries who are at high-risk for lung cancer.
- More than 260 patients are currently enrolled in the screening program, which has a lung cancer detection rate of more than 5%.
- Now seen as setting a standard for military treatment facilities, the program goes beyond screening to help patients quit smoking and obtain proper follow-up care.

For decades, the U.S. military included cigarettes in its rations—ready-to-eat meals issued to service members in the field. With access to these free cigarettes, military personnel in stressful combat situations often smoked. Recognizing the adverse health effects associated with smoking, the military pulled cigarettes from its rations in 1975. But with inexpensive cigarettes widely available overseas and stress a constant factor, service members continue to take up smoking at a higher rate than the general population.¹ As a result, military service members and veterans may be at a greater risk of developing lung cancer than their civilian counterparts.

In 2012, radiologists at Walter Reed National Military Medical Center (WRNMMC) in Bethesda, Md., took action to address the issue and improve patient care by working with a multidisciplinary team to develop a lung cancer screening program for military service members, veterans, and other beneficiaries. The program follows the success of the radiology team's CT colonoscopy screening program, which has provided more than 20,000 exams since its inception in 2004. Inspired by the National Lung Screening Trial (NLST), a decade-long study that showed a 20% reduction in lung cancer mortality with low-dose CT (LDCT)², WRNMMC's lung cancer screening program has had a lung cancer detection rate of more than 5%. "We suspect that we have a high-risk population, and we're slowly discovering that is indeed the case," says Cmdr. Elena Prezioso, director of the lung cancer screening program and physician assistant in pulmonary medicine at WRNMMC. "We're saving lives through this program."

Before WRNMMC established its lung cancer screening program, patients who did not have symptoms of lung cancer or another abnormality that required a chest CT were not routinely screened. Therefore, the chance of detecting a patient's lung cancer early was relatively low. With the program, primary



Walter Reed National Military Medical Center has developed a successful lung cancer screening program.

care physicians and other providers can refer patients who meet certain criteria for routine LDCT screening and coordinated follow-up care. Patients can also self-refer to the program in much the same way that women self-refer for mammography screening. "If we find a tumor, we can deal with it at an early stage and have curative intent," Prezioso says. "That makes a big difference in a patient's life."

The Ground Work

WRNMMC began developing its lung cancer screening program after the NLST results were released in 2011. A multidisciplinary team, including physicians from radiology, oncology, pulmonary medicine, primary care, and preventative medicine, led the effort. "We had a group of people who had already worked together on tumor boards and on other lung cancer-related programs, so lung cancer screening was a natural outgrowth of that

group,” says Cmdr. Joel A. Nations, MD, chief of medicine and a pulmonary and critical care physician at WRNMMC. The hospital’s leadership supported the team. “Our leadership wanted us to pioneer the screening program at our hospital and set a standard for other military treatment facilities,” explains Cmdr. Robert Liotta, MD, deputy director for clinical support and a cardiothoracic radiologist at WRNMMC.

The team began building the program by establishing a set of criteria for patients who should be screened for lung cancer. It opted to follow two criteria based on the National Comprehensive Cancer Network’s (NCCN) screening guidelines. Criteria one, which correlates closely with the Medicare reimbursement guidelines for lung cancer screening, opens the program to patients 55-80 who have at least a 30 pack-year history of smoking and who currently smoke or who quit smoking fewer than 15 years ago. Criteria two opens the program to patients 50 and older who have at least a 20 pack-year history of smoking and who have one additional risk factor, such as a family history of cancer, pulmonary fibrosis, or past exposure to toxic chemicals, such

as asbestos, radon, agent orange, or silica/silicon. “The big thing is enrolling high-risk patients into the program and making sure that they qualify based on the criteria that we set,” Liotta says.

Once the patient criteria were determined, WRNMMC’s radiology department developed a schedule and ordering process for the CT screenings. It designated Tuesdays as lung cancer screening days and created a special order form for the program. “We created a new order in the computer that would pop up in our radiology information system, so we would know that the order was for the lung cancer screening program, and we would know how to protocol it appropriately,” Liotta explains. The radiologists also developed a new dictation template to ensure that they dictate their lung cancer screening reports consistently. “By doing that, the patient gets continuity of care and the referring physician knows exactly where to look on the report for specific information,” Prezioso notes.

Focus on the Patient

While LDCT is at the heart of the lung cancer screening program, WRNMMC’s radiology

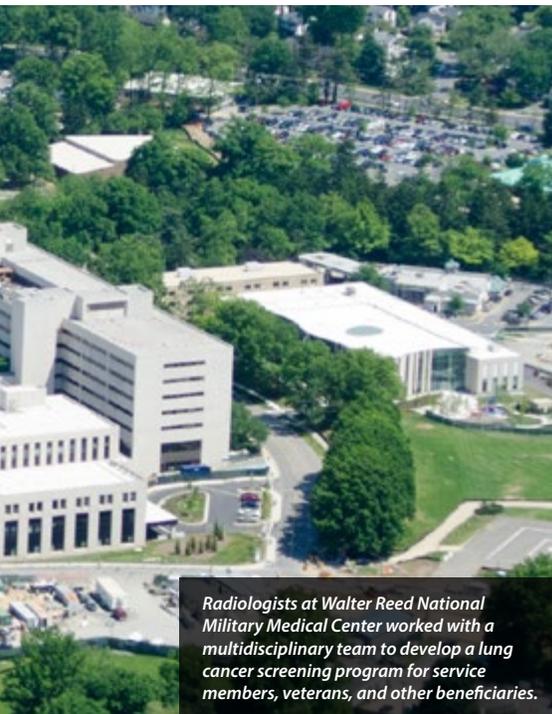
team wanted to do more than simply scan patients and send them on their way. To ensure patients get the most out of the program, the radiology team adjusted its workflow to provide preliminary reads of the screening studies. Prezioso discusses these initial results with patients before they leave the hospital, and final reads are issued soon thereafter. “We recognize that patients want their imaging results as quickly as possible,” Prezioso says. “Radiology stands by to give initial reads so that patients can go home with preliminary results and some peace of mind. It’s part of our commitment to patient-centered care.” Patients whose CT scans reveal incidental findings can see a pulmonologist that day.

Additionally, the lung cancer screening team partnered with WRNMMC’s smoking cessation coordinator to encourage screening participants to quit smoking. Immediately following the scan, a patient in the program can see the smoking cessation coordinator to develop a plan or to follow up on an existing regimen to quit smoking. So far, 109 lung cancer screening patients have participated in the smoking cessation program, and of those, 30% have quit



smoking. That's higher than the national quit rate of 25% for smokers who use smoking cessation medications alone.³ The holistic approach addresses all of a patient's issues with smoking at the same time, Liotta says. "We wanted to provide these services to give patients a one-stop shopping experience on the same day as the scan," he says. "Patients really like that."

Another way the lung cancer screening team engages patients in the program is through direct communication. When a patient is due or overdue for a follow-up scan, Prezioso calls him or her to discuss scheduling an appointment. "We didn't want people just getting a chest CT and then not being followed up," Liotta says. "So we actually have a system in place where our program is reaching out to patients and encouraging them to come in for their follow-up exams." While Prezioso has been making these calls, the radiology department will take over this outreach effort soon. "We're looking at having a radiology nurse or one of our clinic nurses help run the program," Liotta explains. "Doing so will raise radiology's profile because patients will receive calls directly from our department."



Radiologists at Walter Reed National Military Medical Center worked with a multidisciplinary team to develop a lung cancer screening program for service members, veterans, and other beneficiaries.

The Greatest Good

As WRNMMC prepared to roll out its screening program in November of 2012, in coordination with Lung Cancer Awareness Month, it began educating referring physicians about the program. As part of these efforts, Prezioso visits referring physicians' offices to talk to them about the screening program. During these visits, she distributes pocket-sized laminated cards that outline the program's patient criteria. She also hands out provider intake forms to help referring physicians determine whether patients qualify for the program. "We want to make sure we're sticking with the criteria and not just screening willy-nilly," Prezioso explains. "The idea is to do the greatest good for the largest number of patients possible, with the least harm."

The lung cancer screening team also markets the program through promotional videos, direct-to-patient outreach efforts, and informational events. One video the team produced to encourage referring physicians to talk to their patients about the program has been distributed throughout the Military Health System. The team also created a webpage where patients can access information about the program, along with a questionnaire to help them determine whether they should enroll in the program. Additionally, the lung cancer screening team hosts two annual events, one a CME event, that includes informational booths and lectures about lung cancer awareness, prevention, screening, and research. The events attract hundreds of referring physicians, medical staff, and patients.

These marketing and outreach efforts have paid off. Currently, more than 260 patients are enrolled in screening and 14 patients have been diagnosed with lung cancer through the program, with about half of those cases being early stage. The team is currently enrolling about six new patients per month. Maj. Christina Brzezniak, DO, assistant service chief of hematology and oncology, says that the program improves patient care and reduces healthcare costs. "When we detect lung cancer early, we can avoid having to subject patients to systematic chemotherapy," Brzezniak says. "That is huge from both a

COURTESY OF WRNMMC

LUNG CANCER SCREENING CARD

High Risk: Age 55–80 and 30 pk-yr and Smoking/Tobacco cessation <15 yr
OR
Age >50 and >20 pk-yr and one additional risk factor other than second-hand smoking (Occupational Exposure, HEENT CA Hx, FHx of Lung CA 1st degree relative, Chronic Lung Disease)

• RISK FACTORS •

Occupational Exposure: Radon, Asbestos, Agent Orange, Silica/Silicon

Cancer Hx: Lung, HEENT, Lymphoma, Cancer related to smoking

Family Hx: 1st degree relative with Lung Cancer

Chronic Lung Disease: COPD, Pulmonary fibrosis

Questions Call:
Pulmonary Front Desk
(301) 295-4191 and ask for CDR Prezioso

♦ Reference National Comprehensive Cancer Network Guidelines (NCCN.org)

Walter Reed Military Medical Center has taken multiple steps to promote lung cancer screening directly to patients.

cost standpoint and a patient care perspective. If we can avoid exposing patients to the toxicities associated with chemotherapy, then we've done them a tremendous service."

By Jenny Jones

ENDNOTES

1. Brown DW, Smoking prevalence among US Veterans, *J Gen Intern Med*, 2010 Feb; 25(2): 147-149.
2. National Cancer Institute. National Lung Screening Trial 2014. <http://bit.ly/Lungtrial> Accessed Oct. 14, 2015.
3. American Cancer Society. A Word About Success Rates for Quitting Smoking. bit.ly/ACS_QuitSmokingGuide. Accessed Oct. 22, 2015.

Next Steps

- Assemble a multidisciplinary team to build a robust lung cancer screening program.
- Collaborate with smoking cessation and other partners for focused patient care.
- Consult with referring physicians and patients to educate them about the program.



Lung Cancer Screening Discussion Questions

Jump-start a conversation about lung cancer screening.

1. What percentage of your community's population smokes? How does that compare to state and national levels?
2. What percentage of your patient population is eligible for lung cancer screening?
3. How many lung cancers are detected in your community? How many are detected at Stage 4 vs. an earlier stage? How do these numbers compare to state and national levels?
4. Which care providers can you partner with to develop a lung cancer screening program?
5. What additional staff do you need to support your program? How can you fund these positions?
6. How can you secure dedicated time on your CT scanner for lung cancer screening?
7. What can you do to educate patients and referring physicians about lung cancer screening?
8. How can you reassure referrers that a lung cancer screening program will not result in radiologists commandeering their patients?
9. How can you integrate smoking cessation into your lung cancer screening program?
10. Where can you meet with patients to review their findings and scans?
11. How can you monitor patients to ensure they receive recommended follow-up care?
12. How can you encourage eligible patients to return annually for lung cancer screening?

Are you an LCS Novice or Ninja?

Test Your Lung Cancer Screening Knowledge

- CMS guidelines state that patients between which age range are eligible for lung cancer screening?
 - 60-75
 - 55-77
 - 48-62
 - 62-85
- The American Lung Association estimates that ____ people in the United States are at high-risk for lung cancer:
 - 3 million
 - 8 million
 - 12 million
 - 16 million
- Which cancer is the leading killer of both men and women in the United States?
 - Colon
 - Breast
 - Throat
 - Lung
- Lung cancer accounts for what percentage of all cancer deaths in the U.S.?
 - 8%
 - 15%
 - 25%
 - 37%
- Before patients enroll in lung cancer screening, CMS requires that they:
 - Undergo a pulse oximetry test
 - Meet with a smoking cessation expert
 - Schedule a shared decision-making visit
 - Determine their family history for lung cancer
- Data from the National Lung Screening Trial (NLST) in 2011, showed a ____ reduction in lung cancer mortality in patients who received low-dose CT (LDCT).
 - 2%
 - 5%
 - 20%
 - 40%
- All of the following are known risk factors for lung cancer, except:
 - Tobacco smoking
 - A personal or family history of lung cancer
 - Exposure to radon, asbestos, or other carcinogenic agents
 - Pet dander, pollen, and other allergens
- Evidence shows that patients have a ____ greater chance of quitting smoking when they combine some type of counseling with a nicotine replacement therapy or medication.
 - 50%
 - 63%
 - 80%
 - 199%
- True or False: Radiology practices must invest in special CTs for lung cancer screening?
 - True
 - False
- ACR LUNG-RADS state that a patient with a nodule that is probably benign should:
 - Schedule a follow-up LDCT in six months
 - Immediately undergo a second LDCT
 - Continue annual screening
 - Undergo a biopsy to confirm it's benign
- When lung cancer is diagnosed early, the five-year survival rate can be as high as ____.
 - 40%
 - 65%
 - 82%
 - 90%
- Screening should be discontinued once a person has not smoked for ____ years.
 - 10
 - 15
 - 20
 - 30



Scoring: Novice to Ninja

How did you score? Give yourself one point for every correct answer.

If you scored from 0-4: You are an **LCS Novice**, and you should contact the ACR LCS team at bit.ly/LCSQuestions to learn more about how you can boost your knowledge and start a LCS program in your community.

If you scored from 5-8: You are an **LCS Enthusiast** who recognizes that radiologists are central to LCS, and you are probably well on your way to partnering with other care providers to establish an LCS clinic in your community.

If you scored from 9-12: You are an **LCS Ninja**. You really know your stuff and have already stepped up as a leader in your community to facilitate and promote life-saving LCS.

Whatever your score, there's a lot to learn from the LCS leaders profiled in these case studies and from the **ACR LCS resources**. Take the next step toward enhancing patient care in your community. Start or strengthen your LCS program today!
(Learn more at acr.org/lungresources)

Answers

- b. 55-77
- b. 8 million
- d. Lung
- c. Schedule a shared decision-making visit
- c. Schedule a follow-up low-dose CT in six months
- c. 25%
- d. Pet dander, pollen, and other allergens
- a. 50%
- a. False — Any modern CT scanner can be calibrated for the low dose required for lung cancer screening.
- a. Schedule a follow-up low-dose CT in six months
- d. 90%
- d. 15

Lung Cancer Screening Resources You Can Trust



The American College of Radiology (ACR®) offers resources to help radiologists provide safe, effective lung cancer screening, including Lung Cancer Screening Education, toolkits and key patient information.

Using the website listed below, access quality assurance tools, such as the CT Quality Control Manual, as well as patient education handouts on making informed choices, how to prepare for a screening and much more.

Visit [acr.org/lungresources](https://www.acr.org/lungresources)



Q&A Support

Do you have questions about lung cancer screening implementation? Our experts are ready to help. Scan this QR code to submit your questions easily with your smartphone or visit [acr.org/lungresources](https://www.acr.org/lungresources).

