A Model for Demonstrating Sustainable Outreach for Cancer Screening

BY JAMIE RIES, RN, CMSRN
AND MICHAEL GIESKE, MD

St. Elizabeth Healthcare, located in Northern Kentucky and Southeast Indiana, is a community-based health care system with 6 hospitals. The affiliated 800-provider group serves 400,000 patients. We recognize that prevention, early detection, the latest diagnostic work-up tools and treatments, and whole person care are essential when it comes to fighting the battle against cancer; we are committed to providing these services to our patients. With state-of-the-art facilities, advanced technologies, and compassionate care teams, we confidently ensure the best possible outcomes for our patients.

The Significance of Cancer Screening

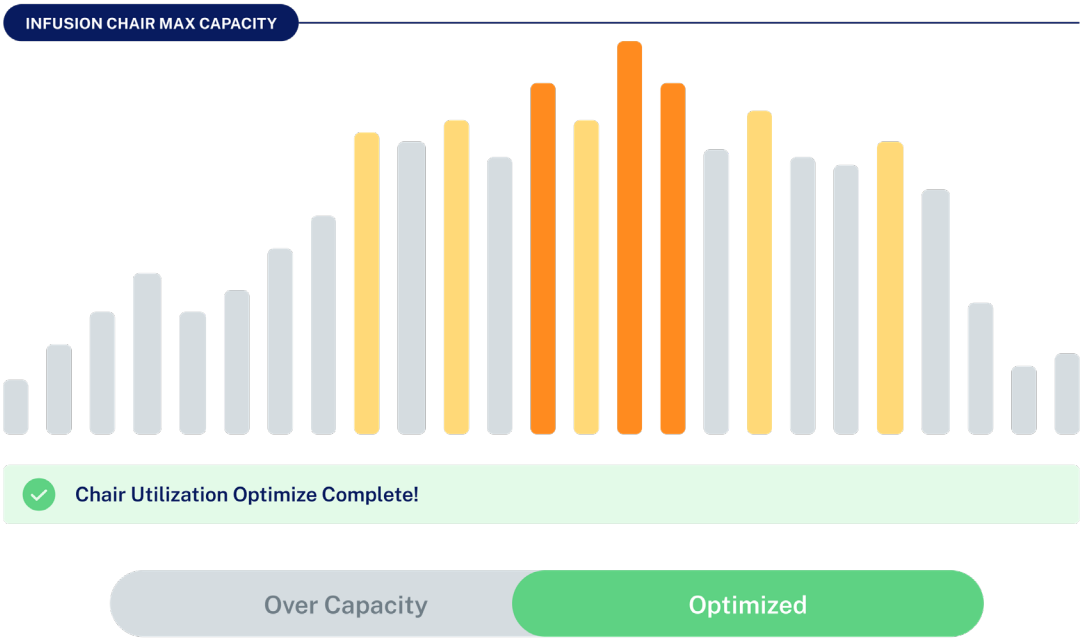
Cancer screening plays a pivotal role in our approach to delivering comprehensive cancer care. Early detection through screening significantly improves the chances of survival and reduces the burden of cancer on individuals and communities.[1,2] In the United States, the President's Cancer Panel and the Cancer Moonshot initiative have placed an emphasis on increasing cancer screening uptake and closing the gaps in cancer screening, access, and follow-up care. Improving lung cancer screening rates in a manner more consistent with the trajectory patterns and penetrance of breast, cervical, and colon cancer screenings is a focus of an enhanced outreach effort.[3] In this article, we will present the results of our screening programs and innovative processes that have increased the uptake of these lifesaving options substantially. Our focus includes breast, colorectal, and lung cancer screenings and complementary tools. A central challenge in this process is ensuring that patients promptly follow through with their screening recommendations and orders. The effectiveness of cancer screening can be complex and resource-intensive, necessitating adherence to established protocols and demonstrating a return on investment

Early detection through screening significantly improves the chances of survival and reduces the burden of cancer on individuals and communities.

Continued on page 49

Operate smarter to reduce patient wait times and nurse burnout

Optimize infusion scheduling, level-load patient flow, and improve experience for patients and staff alike.



Earn **$20K/chair** annually.*

Realize **50% reduced** wait times*

LeanTaaS | iQueue FOR INFUSION CENTERS

LEARN MORE

*Based on historical customer outcomes, results vary.

Continued from page 47

(ROI) for screening programs. Establishing ROI is critical for securing funding and support of, and long-term sustainability for, these programs that improve outreach to patients with outstanding orders.[4]

Identifying and Engaging Patients

Identifying eligible patients is crucial, and it is the first step in our screening outreach efforts. We use the latest US Preventive Services Task Force (USPSTF) criteria in leveraging our electronic health record (EHR) system Epic (Epic Systems) to achieve this goal.[5] When a patient has not undergone appropriate cancer screening within the recommended time frame, our health maintenance section in the EHR triggers alerts for clinical associates and providers. In the case of lung cancer screening, providers receive additional prompts through a best practice alert when a patient qualifies for lung cancer screening but has not had a low-dose CT (LDCT) lung cancer screen or another qualifying chest CT within a year.

We closely monitor and maintain the uptake of cancer screening through a Qlik Sense (Qlik) dashboard, providing monthly performance reports to monitor and encourage provider compliance. Every quarter, we conduct a comprehensive review of our lung cancer screening program and rank the 192 providers and 41 primary care sites by their capture of eligible patients. Additionally, a Provider Achievement Dashboard assists in monitoring and tracking uptake for select quality metrics including cancer screenings. These data are integrated into annual provider reviews.

Shifting Focus and Overcoming Challenges

Initially, our efforts were primarily concentrated on breast and colorectal cancer screening, as they were tied to the Healthcare Effectiveness Data and Information Set (HEDIS) measures provided by the National Committee for Quality Assurance. However, with the establishment of a robust lung cancer screening program that demonstrated notable results and successes, our attention began to shift towards supporting the uptake of lung cancer screenings. Moreover, there is an expectation that lung cancer screening will become a HEDIS measure by 2025, making it imperative to implement streamlined and effective processes in the interim.

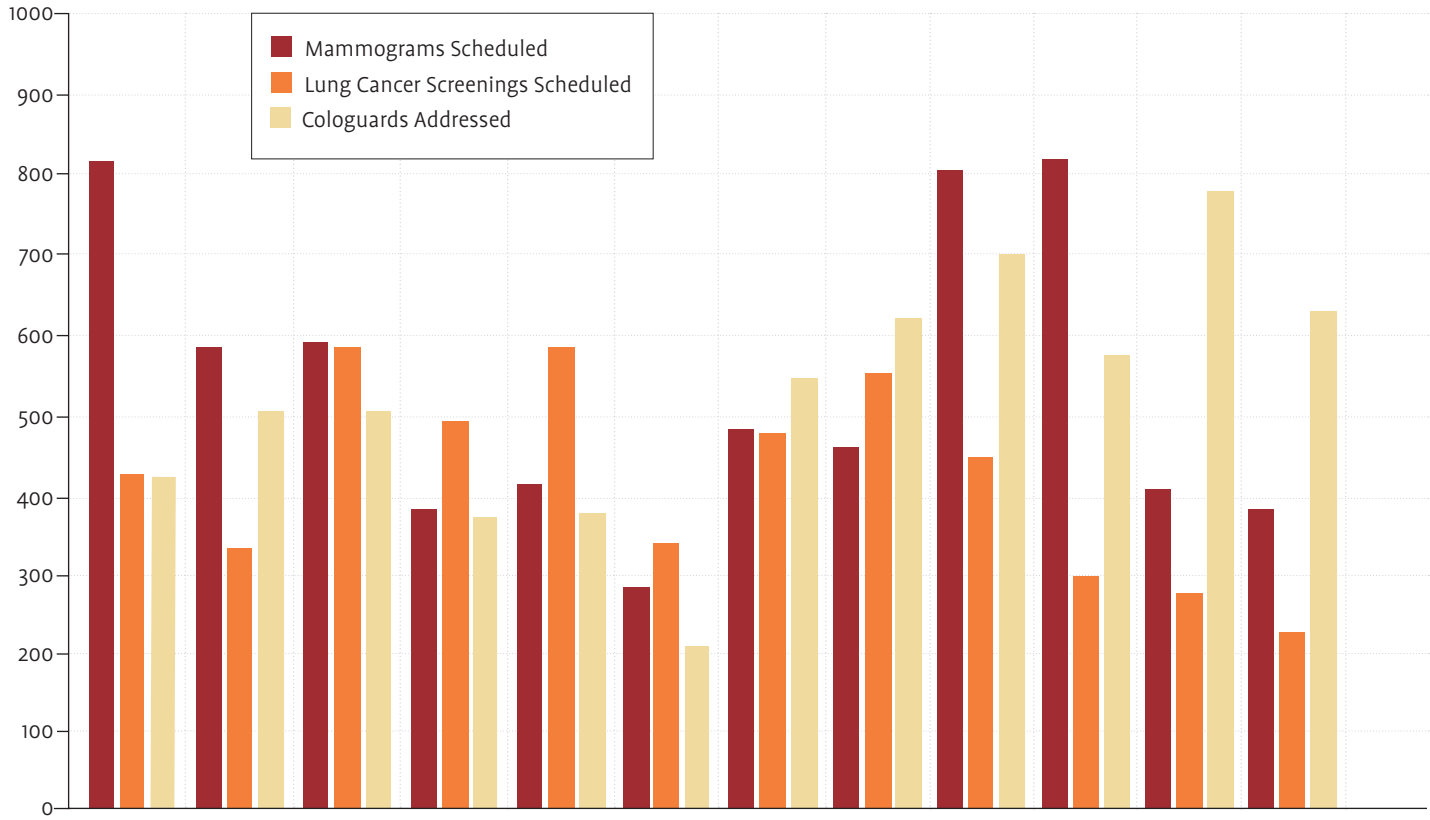
In 2018, we integrated social service workers into our practices while building the infrastructure and network to support the Comprehensive Primary Care Initiative (CPCI) of the Centers for Medicare & Medicaid Services. In the early days of the CPCI program, the social services team had the capacity to contact patients with outstanding orders. As CPCI responsibilities evolved, however, these resources became strained, leading to the decommissioning of this component of lung cancer screening program outreach. In October 2020, during the COVID-19 pandemic, our new Cancer Care Center opened, and a medical assistant was hired to support and coordinate the Integrative Medicine Program for the Cancer Care Center. Workload changes during the pandemic allowed the medical assistant to redirect time and efforts to lung cancer screening program outreach in early 2021. However, she eventually returned to her previous position and duties. Subsequently, our new Virtual Health Center Nurse Triage team assumed the outreach role in mid-2021, as the team was not yet fully used in the early phases of the program. As that program resumed, there was no available support for the outreach. Each of these short-term efforts led to substantial improvements in uptake and adherence; still, each was ultimately unsustainable for various reasons.

Demonstrating ROI: A Key to Sustainability

In 2019, we conducted an extensive and comprehensive financial analysis of our breast, colorectal, and lung cancer screening efforts. This exercise was instrumental in demonstrating positive net ROI for these programs and considering associated expenses, reimbursement, payer mix, and dowwnstream revenues. The analysis revealed net returns of $280 per LDCT lung cancer screen, $257 per colonoscopy, and $126 per mammogram. This review laid the foundation for securing registered nurse (RN) resources for our Population Health Support Services team.

Our order completion outreach program, with refined workflows, commenced in August 2021 and continued throughout 2022. Presently, we employ 12 outreach specialists who contact patients with an outstanding mammogram, Cologuard (Exact Sciences), or LDCT lung cancer screening order. These outreach specialists are all licensed RNs. Data from these 2022 outreach efforts are illustrated in Figure 1.

Figure 1. Data for Outstanding Orders for Mammograms, Cologuard Testing, and Lung Cancer Screenings, 2022



	Jan 22	Feb 22	Mar 22	Apr 22	May 22	Jun 22	Jul 22	Aug 22	Sep 22	Oct 22	Nov 22	Dec 22	Total
Mammograms Scheduled	813	579	596	388	407	282	487	465	802	822	411	389	6441
Lung Cancer Screenings Scheduled	433	339	590	497	503	340	484	554	446	295	270	239	4990
Cologuards Addressed	425	510	508	373	377	216	549	628	699	576	785	630	6276

Multidisciplinary collaboration among leadership from the Population Health Support Services and Quality Transformation teams, screening and thoracic oncology nurse navigators, and providers occurs every 2 weeks; it has been instrumental in the growth, improvement, and success of our programs. This level of support and contribution has been highlighted in several other outreach efforts.[6–9] Members of our Breast Center coordinate, track, and manage all breast cancer screening efforts; the Breast Center also benefits from this coordinated outreach and promotes lung and colorectal cancer screening.

Effective Outreach Strategies

For preventive lung cancer and breast cancer screenings, the outreach team contacts the patient by phone if an order is not followed by an appointment within 14 days. Likewise, the outreach team contacts a patient to complete a Cologuard order if no test result is available 60 days after order placement. The outreach team attempts to contact patients twice. After the first attempt, a MyChart message is sent to patients; another attempt follows after 1 week in a continued effort to schedule patients' screening. If patients are admitted to the hospital, outreach contact is delayed for 30 days. If patients remain unreachable after the first 2 outreach attempts, they return to the worklist for continued outreach attempts after 180 days. Patients who receive active cancer treatment, long-term care, or hospice care are also excluded from outreach for 180 days.

Tracking Progress and Challenges

The historical progress of our breast, colorectal, and lung cancer screening efforts is represented in Table 1.[10-12] We were on track to exceed 80% for breast cancer screening just before the COVID-19 pandemic, but the global pandemic created challenges to achieving this goal. Colorectal cancer screening rates have improved steadily, which demonstrates our persistence in driving positive outcomes despite both expanded age ranges for screening and growth in the population of eligible patients. The lung cancer screening initiative faced a significant setback in the spring of 2020, with only 13 lung cancer screenings recorded in April 2020. The year concluded with a 5.81% decline compared with 2019. Nevertheless, we have made considerable strides in improving these lung cancer screening metrics.

Through our participation in the American Cancer Society's Return to Screening Learning Collaborative project, we learned that the challenges we faced with screening rates following the pandemic were not unique to our organization. In fact, these issues were experienced at many organizations across the country.

Table 1. St. Elizabeth Health Care Cancer Screening Rates, 2018–2021

YEAR	LUNG, %	BREAST, %	COLON, %[a]
2018	na	68	63
2019	36.0	77.6	73
2020	29.3	72.4	74.2
2021	49.7	67.4	73.7
2022	44.1[b]	73.3	72.8
2023, projected[c]	47.1	78.3	77.5
National[10–12]	6.51	66.7	68.8

CMS, Centers for Medicare & Medicaid Services; NA, not available; USPSTF, US Preventive Services Task Force.

[a] Rates reflect USPSTF 50- to 75-year-old patient population
[b] Changed from CMS 2015 to USPSTF 2021 criteria
[c] Annualized from July 31, 2023

Impact of Outreach Programs

The implementation of outreach programs to complete orders has wielded substantial influence on the uptake of each respective cancer screening program. To date, our lung cancer screening program resulted in over 37000 successfully completed lung cancer screenings since its start in 2013. In 2022, the Population Health Support Services team scheduled 4990 lung cancer screening appointments; of those, 3113 patients successfully completed screenings. Remarkably, these data account for 38% of the total 8219 lung cancer screenings completed in 2022. This achievement has contributed significantly to improving our adherence rate, which stands at 52% for 2021 and 59% for 2022.

In addition to lung cancer screenings, 7189 breast cancer screenings were scheduled by members of our program in 2022. Of those scheduled appointments, 3976 screenings were completed, which accounts for 15% of the organization's completed breast cancer screenings that were scheduled through Population Health Support Services. The impact of 12 RN outreach specialists on screening efforts for an organization with 2400 associates is outstanding. We anticipate that this outreach department will continue to grow to meet the needs of our growing patient community.

Secrets to Success

Many factors contribute to sustaining an outreach program and demonstrating the positive results and impact on patients' lives. During every outreach call, staff members attempt to close all open care gaps and provide resources and education for patients. Members of Population Health Support Services continuously stay true to the phrase "Smile and Dial." We make every outreach attempt count by educating about the importance of preventive cancer screening and ways that it can save lives. In addition, our team collaborates with internal and external departments that include care management. For example, during outreach calls, patients may indicate that they need assistance with transportation to their scheduled appointment; we have the resources available to meet that need.

> Early detection through screening significantly improves the chances of survival and reduces the burden of cancer on individuals and communities.

The Importance of Lung Cancer Screening

Lung cancer is a significant public health concern, and early detection is crucial for improving patient outcomes. Aberle et al provided a pivotal development in lung cancer screening with the landmark United States National Lung Screening Trial (NCT00047385) published in the *New England Journal of Medicine* in 2011; results of this study demonstrated the effectiveness of LDCT screening in reducing lung cancer mortality.[13] The large-scale, multicenter study compared LDCT screening with standard chest x-rays in a high-risk population of patients who currently or formerly used tobacco products. Over 53000 participants were enrolled, making it one of the largest studies ever funded by the National Cancer Institute. The trial's findings were astounding: LDCT screening resulted in a 20% reduction in lung cancer mortality when compared with chest x-rays. This study has played a pivotal role in the field of lung cancer screening and has shaped the guidelines, policies, and strategies regarding LDCT lung cancer screening for high-risk individuals.

Although on a smaller scale, the NELSON lung cancer screening trial (NELSON Netherlands Trial Register number NL580) conducted in Belgium had a similar and profound impact in the European theater.[14]

Outcomes of both practice-changing studies served as catalysts for the development of associated guidelines and the integration of LDCT into lung cancer screening programs across the United States. At our healthcare system, since March 2022, we have closely followed the USPSTF 2021 guidelines for lung cancer screening, which recommend annual LDCT screening for individuals aged 50 to 80 years who have a 20 pack-year smoking history and currently smoke or quit smoking within the previous 15 years. Our screening program has been instrumental in identifying eligible patients and ensuring that they receive the recommended LDCT screening. Our program's success can be attributed to a dedicated team of nurse navigators, radiologists, thoracic surgeons, pulmonologists, and other healthcare professionals who work collaboratively to provide comprehensive care to patients at risk of lung cancer.

Overcoming Challenges in Lung Cancer Screenings

The National Lung Screening Trial and subsequent studies have highlighted the benefits of LDCT screening in reducing lung cancer

mortality, yet lung cancer screening programs continue to face many challenges. One significant challenge is identifying eligible patients and encouraging them to be screened. High-risk individuals and their providers may not be aware of their eligibility, and some may be hesitant to undergo screening due to concerns about radiation exposure or fear of a cancer diagnosis. Historically, lung cancer has had a dismal prognosis; many consider it a death sentence. This belief is difficult to combat, but the changing landscape of response to novel treatments and technologies and of improved survival have given new hope to patients with lung cancer.

Many individuals at risk for, or with a diagnosis of, lung cancer are ashamed of their tobacco dependence, or they blame themselves for developing the malignancy. No one with lung cancer deserves the disease, and certainly no one deserves to die from it. This stigma is woven deeply into the fabric of our culture, and it profoundly impedes the uptake of lung cancer screenings.

To address these challenges, our program implemented a multifaceted approach to patient outreach and education. We use EHRs to identify eligible patients, and our nurse navigators play a vital role in educating patients about the benefits of screening and addressing their concerns. Additionally, we collaborate with primary care providers to ensure that eligible patients are referred for LDCT screening.

The implementation of lung cancer screening in our healthcare system impacted early lung cancer detection significantly.[15] Since the inception of the program, we have screened thousands of high-risk individuals, leading to the early detection of lung cancer in many cases. We have found 1 incidence of lung cancer for every 28 unique patients screened, with over 60% of patients diagnosed with stage I disease since the inception of our program in 2013. Early detection allows for more effective treatment options, far less costly care, and improved patient outcomes. Figure 2 demonstrates that our efforts resulted in significant stage migration from 2015 to 2022–3103 diagnoses of lung cancer among 459 screened patients and 2644 individuals who were not screened. Sharing these data and successes generated within our health care system has been a huge motivator for providers, managers, associates, and administrators to support lung cancer screening.

As a testament to the impact of our lung cancer screening program, the proportion of late-stage (III/IV) lung cancer has fallen 23.1% over the 8 years between 2015 and 2022 (Figure 3). Diagnoses of early-stage lung cancer surpassed those of late-stage lung cancer in 2022. A portion of this improvement trend may also be attributed to the enhanced focus on the incidental pulmonary nodule program and implementation of supporting software for this program.

The Importance of Regular Mammograms

Breast cancer is one of the most common cancers affecting women worldwide. Mammography, a specialized x-ray of the breast, is a cornerstone of breast cancer screening programs. Early detection of

Figure 2. St. Elizabeth Healthcare Lung Cancer Screening Stage Migration, 2015-2022

LDCT lung cancer screening (hospital—symptomatic, incidental)
Total, 3102 lung cancers

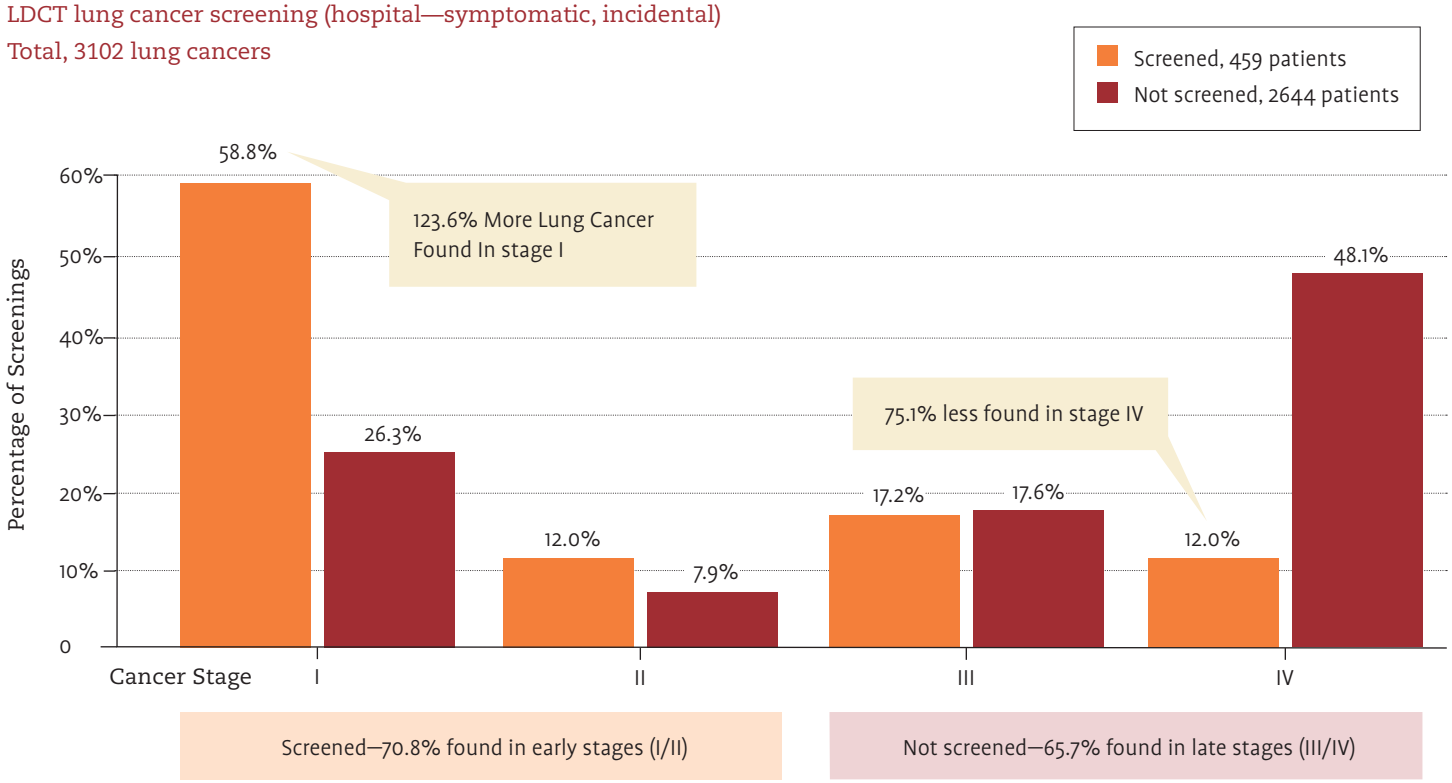
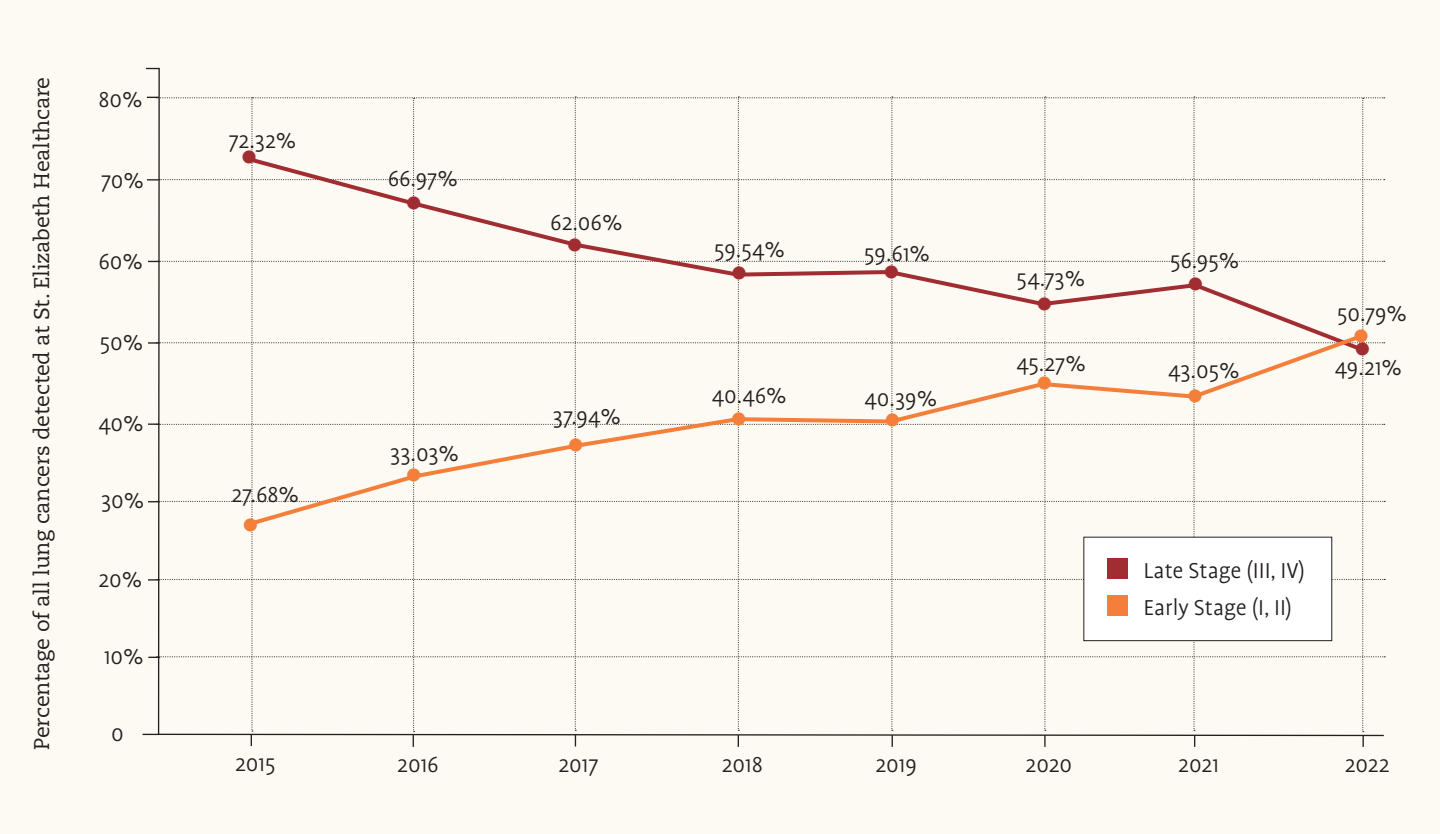


Figure 3. Diagnoses of Early vs Late-Stage Lung Cancer, 2015–2022



breast cancer through mammography can significantly improve treatment outcomes and reduce mortality rates.[16–18]

Per USPSTF guidelines, regular mammograms are recommended for women starting at 50 years of age, although guidelines may vary based on individual risk factors and family history.[19] These screening tests play a crucial role in detecting breast cancer at an early, more treatable stage. Women who undergo routine mammograms are more likely to receive timely interventions and to experience better long-term outcomes. Staff members at our healthcare system are committed to promoting regular mammography screening and ensuring that eligible women receive this important preventive service.

With our order completion process, nurse navigators contact patients who are eligible for the screening and schedule appointments as appropriate. If outreach attempts are unsuccessful, patients are contacted again until the orders expire or these individuals are successfully scheduled.

Challenges in Breast Cancer Screening

Despite the clear benefits of mammography, breast cancer screening programs face challenges like those encountered in other cancer screening efforts. These challenges may involve patient awareness, access to screening facilities, and timely follow-up for abnormal results.[20] To address these challenges, our breast cancer screening program employs a proactive approach to patient outreach and education. We prioritize timely follow-up for abnormal mammograms, and a dedicated team of radiologists, nurse navigators, and oncologists work together to provide comprehensive care to patients.

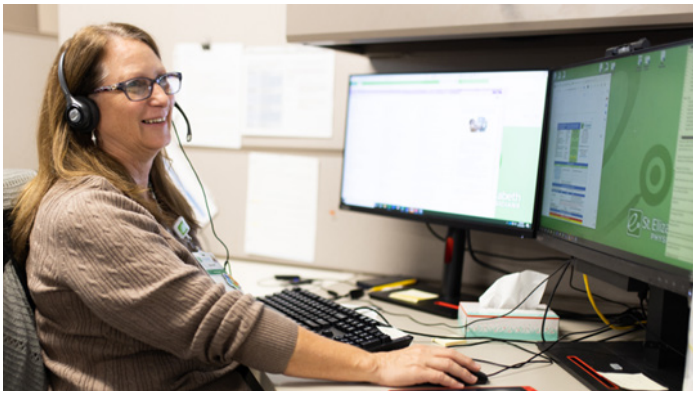
The Importance of Colorectal Cancer Screening

Colon cancer—a serious yet preventable disease—underscores the importance of regular screening. Cologuard offers a noninvasive, effective screening option that improves patient participation and early detection.[21,22] Cologuard detects genetic markers, DNA changes, and hemoglobin in the stool that indicate the presence of colon cancer or precancerous polyps. The test's convenience and efficacy have amplified its role in screening programs and have overcome patient hesitancy concerning more invasive procedures. The Population Health Support Services team's proactive outreach, informative initiatives, and encouraging support have inspired patients to embrace this choice.

Challenges in Colorectal Cancer Screening

Colorectal cancer screening is crucial for early detection and prevention, but it comes with its share of challenges. One significant challenge is patient compliance, since traditional methods like colonoscopy can be invasive, uncomfortable, or inconvenient and can lead some individuals to opt out of screening completely. Additionally, fear of anesthesia or lack of access to healthcare services and/or insurance coverage can limit screening opportunities for many individuals.

Cologuard has emerged as a promising option to address many of these issues. However, the test's effectiveness can vary, and false



positives or false negatives may result. Moreover, use of Cologuard may not be suitable for everyone, as it is primarily recommended for individuals at average risk.

Balancing accessibility, accuracy, and patient comfort remains an ongoing challenge in colorectal cancer screening. Cologuard offers a more patient-friendly approach, but healthcare providers must carefully consider its limitations and tailor screening recommendations to individual risk profiles to ensure effective cancer prevention and early detection.[23]

Nurse navigators follow a similar process to complete orders for colorectal cancer screening. Patients are contacted 1 week after the colon cancer screening order has been placed if there is no appointment on record. If patients cannot be contacted, nurse navigators make a second attempt to contact and schedule the patient. If the second attempt is unsuccessful, patients fall back to our order completion reports in 90 days, and the process starts again.

This order completion workflow has been highly successful, since it closes many patient care gaps and serves as the patient's safety net for completing health screenings. Members of our team will tell you that patients are thankful for their care and the knowledge that a nurse is available to contact them and to assist with scheduling appointments that may have been forgotten. This collective effort has helped to establish St. Elizabeth Healthcare as one of the nation's leading users of Cologuard for colorectal cancer screening.

Conclusion

Our health care system has developed a worthwhile, profitable, and sustainable process to ensure outreach to patients with outstanding orders for breast, colorectal, and lung cancer screening. These order completion processes were designed to improve screening uptake and to provide the best care for patients. One key component of our sustainable process is the use of a dedicated outreach specialist team. These nurse navigators are trained to educate patients and the community about the importance of screening, the eligibility criteria, and the availability of screening services. They schedule patients for their appointments and connect uninsured or underinsured patients to community resources that can assist with financial support and transportation to and from screening facilities. In Kentucky, we have built relationships with multiple organizations to provide this support and to help patients complete life-saving cancer screenings. These organizations offer a combination of private, state, and federal funding.

The challenges we face in cancer screening outreach are not unique, but our commitment to addressing these challenges through innovative approaches and collaborative care has yielded substantial progress. As we continue to expand our outreach efforts and leverage technology

to identify and educate eligible patients, we are confident that we can make a meaningful impact on cancer prevention and early detection in our community.

Our processes and workflows allow us to not only identify patients in need of a screening order completion but also to track and follow up with patients until testing is completed. Our nurse navigator teams have also implemented a tightly controlled system for following up on abnormal results for mammograms, Cologuard tests, and LDCT lung cancer screenings. These outreaches are tabulated and built into a report to enable the tracking and management of these outstanding orders and subsequent results. Nurse navigators provide excellent communication and feedback to ordering providers throughout these processes. This collaborative approach ensures that patients who need further evaluation and treatment are quickly referred for surveillance imaging or to specialists, providing the most time-efficient, cost-effective, and coordinated care. Early detection of these cancers allows for easier treatment at less expense and helps us to save lives, reduce the financial burden of late-stage cancer, and ultimately deliver comprehensive cancer care to our patients. OI

Jamie Ries, RN, CMSRN, is manager of Population Health Support Services at St. Elizabeth Physicians in Walton, Kentucky, and Michael Gieske, MD, is director of Lung Cancer Screening at St. Elizabeth Physicians in Erlanger, Kentucky.

References

1. Coldman AJ, Phillips N, Wilson C, et al. Pan-Canadian study of mammography screening and mortality from breast cancer. *J Natl Cancer Inst*. 2014;106(11):261. doi:10.1093/jnci/dju261

2. Pasick RJ, Hiatt RA, Paskett ED. Lessons learned from community-based cancer screening intervention research. *Cancer*. 2004;101(S5):1146-1164. doi:10.1002/cncr.20508

3. Williams JP. President's Cancer Panel report: closing gaps in cancer screening for all Americans. National Cancer Institute. February 3, 2022. Accessed December 22, 2023. https://www.cancer.gov/news-events/cancer-currents-blog/2022/cancer-screening-presidents-cancer-panel-report

4. Brill JV. Screening for cancer: the economic, medical, and psychosocial issues. *Am J Manag Care*. 2020;26(suppl 14):S300-S306. doi:10.37765/ajmc.2020.88534

5. Baus A, Wright LE, Kennedy-Rea S, et al. Leveraging electronic health records data for enhanced colorectal cancer screening efforts. *J Appalach Health*. 2020;2(4):53-63. doi:10.13023/jah.0204.07

6. Dietrich AJ, Tobin JN, Robinson CM, et al. Telephone outreach to increase colon cancer screening in Medicaid managed care organizations: a randomized controlled trial. *Ann Fam Med*. 2013;11(4):335-343. doi:10.1370/afm.1469

7. Subramanian S, Tangka FKL, Hoover S, DeGroff A. Integrated interventions and supporting activities to increase uptake of multiple cancer screenings: conceptual framework, determinants of implementation success, measurement challenges, and research priorities. *Implement Sci Commun*. 2022;3(1):105. doi:10.1186/s43058-022-00353-8

8. Percac-Lima S, López L, Ashburner JM, Green AR, Atlas SJ. The longitudinal impact of patient navigation on equity in colorectal cancer screening in a large primary care network. *Cancer*. 2014;120(13):2025-2031. doi:10.1002/cncr.28682

9. Castañeda SF, Bharti B, Rojas M, et al. Outreach and inreach strategies for colorectal cancer screening among Latinos at a federally qualified health center: a randomized controlled trial, 2015-2018. *Am J Public Health*. 2020;110(4):587-594. doi:10.2105/AJPH.2019.305524

10. Fedewa SA, Bandi P, Smith RA, Silvestri GA, Jemal A. Lung cancer screening rates during the COVID-19 pandemic. *Chest*. 2022;161(2):586-589. doi:10.1016/j.chest.2021.07.030

11. Health, United States, 2019: With special feature on the health of young adults. Table 33. Centers for Disease Control and Prevention. Accessed October 22, 2023. https://www.cdc.gov/nchs/hus/index.htm

12. Colorectal cancer statistics. Health, United States, 2019. June 8, 2023. Centers for Disease Control and Prevention. Accessed October 22, 2023. https://www.cdc.gov/cancer/colorectal/statistics/index.htm

13. Aberle DR, Adams AM, Berg CD, et al. Reduced lung-cancer mortality with low-dose computed tomographic screening. *N Engl J Med*. 2011;365(5):395-409. doi:10.1056/NEJMoa1102873

14. Horeweg N, Scholten ET, de Jong PA, et al. Detection of lung cancer through low-dose CT screening (NELSON): a prespecified analysis of screening test performance and interval cancers. *Lancet Oncol*. 2014;15:1342-1350. doi:10.1016/S1470-2045(14)70387-0

15. Gieske MR, Kerns J, Schmitt GM, et al. Overcoming barriers to lung cancer screening using a systemwide approach with additional focus on the non-screened. J Med Screen. 2023;Online ahead of print. doi:10.1177/09691413231208160

16. Legler J, Meissner HI, Coyne C, Breen N, Chollette V, Rimer BK. The effectiveness of interventions to promote mammography among women with historically lower rates of screening. *Cancer Epidemiol Biomarkers Prev*. 2002;11(1):59-71.

17. Broeders M, Moss S, Nyström L, et al; EUROSCREEN Working Group. The impact of mammographic screening on breast cancer mortality in Europe: a review of observational studies. *J Med Screen*. 2012;19(suppl 1):14-25. breast cancer mortality in Europe: a review of observational studies. J Med Screen. 2012;19 Suppl 1:14-25. doi:10.1258/jms.2012.012078

18. McCarthy AM, Kim JJ, Beaber EF, et al; PROSPR consortium. Follow-up of abnormal breast and colorectal cancer screening by race/ethnicity. *Amer J Prev Med*. 2016;51(4):507-512. doi:10.1016/j.amepre.2016.03.017

19. Screening for breast cancer: USPSTF recommendation statement. U.S. Preventive Services Task Force. U.S. Preventive Services Task Force. January 11, 2016. Accessed October 22, 2023. https://www.uspreventiveservicestaskforce.org/uspstf/recommendation/breast-cancer-screening

20. Mahalakshmi S, Suresh S. Barriers to cancer screening uptake in women: a qualitative study from Tamil Nadu, India. *Asian Pac J Cancer Prev*. 2020;21(4):1081-1087. doi:10.31557/APJCP.2020.21.4.1081

21. Imperiale TF, Ransohoff DF, Itzkowitz SH, et al. Multitarget stool DNA testing for colorectal-cancer screening. *N Engl J Med*. 2014;370(14):1287-1297. doi:10.1056/NEJMoa1311194

22. Ahlquist DA. Multi-target stool DNA test: a new high bar for noninvasive screening. *Dig Dis Sci*. 2015;60(3):623-633. doi: 10.1007/s10620-014-3451-5.

23. Cai SR, Zhang SZ, Zhu HH, Sheng S. Barriers to colorectal cancer screening: A case-control study. *World J Gastroenterol*. 2009;15(20):2531-2536. doi:10.3748/wjg.15.2531