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A Resource for Interprofessional Providers

Lung Cancer Screening in Older Adults

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The National Lung Cancer Screening Trial

Since the results of the National Lung Screening Trial (NLST) were published in 2011, lung cancer screening has taken on new widespread support. The NLST enrolled more than 50,000 asymptomatic adults between the ages of 55-74 years who had at least 30 pack-years of smoking exposure, including former smokers who had quit within the past 15 years. Enrollees were randomized to receive 3 annual screening examinations using low-dose spiral computed tomography (LDCT) or to control group screened with annual chest x-rays. During a median follow-up interval of 5.5 years, there was a 20% reduction in the mortality rate from lung cancer with LDCT screening when compared to screening with annual chest x-rays.

This study provided evidence for the first time that lung cancer screening can shift the detection of lung cancer to earlier stages and that treatment of earlier-stage lung cancer can improve overall 5-year survival. This concept is a welcome finding for the millions of tobacco-exposed adults who have seen virtually no improvement in lung cancer survival rates in decades.

US Preventive Services Task Force Recommendations

Since the NLST results were released, a number of professional organizations have issued recommendations regarding lung cancer screening with LDCT (see table below). Most important among these, because of their influence of health insurance coverage, are recommendations from the US Preventive Services Task Force (USPSTF). The USPSTF issued a Grade B recommendation in support of LDCT screening for lung cancer. A Grade B recommendation means “there is moderate certainty that the net benefit is moderate to substantial.”

The specific recommendations from the USPSTF are for annual lung cancer screening with LDCT “in adults ages 55 to 80 years who have a 30 pack-year smoking history and currently smoke or have quit within the past 15 years”. Furthermore, they recommend, “screening should be discontinued once a person has not smoked for 15 years or develops a health problem that substantially limits life expectancy or the ability or willingness to have curative lung surgery”.

Table. Professional Organizations Recommending Annual Lung Cancer Screening with Low Dose Computed Tomography

Organization	Primary Screening Eligibility Criteria			Additional Screening Eligibility Criteria		
	Smoking Exposure	Lower Age	Upper Age	Smoking Exposure	Lower Age	Upper Age
US Preventive Services Task Force	≥ 30 pack-years*	55	80			
American Association of Thoracic Surgery	≥ 30 pack-years *	50	79	> 20 pack-years **	50	79
American Cancer Society	≥ 30 pack-years *	55	74			
American College of Chest Physicians	≥ 30 pack-years*	55	74			
American Lung Association	≥ 30 pack-years*	55	74			
American Society for Clinical Oncology	≥ 30 pack-years*	55	74			
American Thoracic Society	≥ 30 pack-years*	55	74	Lung cancer survivor		No limit
International Association for the Study of Lung Cancer	≥ 30 pack-years*	55	80			
National Comprehensive Cancer Network	≥ 30 pack-years *	50	79	> 20 pack-years **	50	79

* If patient currently smokes or quit smoking within the past 15 years

** If patient has high risk factors: strong family history of lung cancer, COPD with FEV1 <70%, prior lung cancer, and/or occupational or environmental exposures

TIPS for Lung Cancer Screening in Older Adults

- Consider ordering low-dose spiral computed tomography (LDCT) to screen for early lung cancer in patients 55-80 years old if they have a smoking history ≥ 30 pack-years and either currently smoke or quit within the past 15 years.
- Before ordering LDCT screening, assess whether the patient has health problems that might limit life expectancy, in which case screening may not be appropriate. Also discuss the potential benefits and harms of screening.
- Also assess whether the patient has the ability and willingness to undergo surgical treatment for lung cancer. If not, screening is not appropriate.

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Recommendations Not in Support of Screening

In contrast to the 9 organizations listed in the table that recommend screening, the American Academy of Family Physicians (AAFP) concluded that there is insufficient evidence to support annual screening. AAFP points out that results of the 3-year NLST should not be generalized to annual screenings that could continue for decades. In addition, AAFP noted that screening is accompanied by a high false-positive rate, with many patients undergoing further evaluation.

Although a high false-positive rate is a concern, advocates of screening would counter that in the NLST study, the majority of patients with positive screens underwent additional clinical (72%) and imaging (81%) studies for false-positive nodules; only 10% had invasive procedures. And, of course, lung cancer is the greatest cause of cancer death in the US. A 20% reduction in 5 year mortality means that over 30,000 lives could be saved each year with appropriate screening, adding valuable years of life.

Health System Considerations

As the population ages, the number of current and former smokers who meet the age criteria for LDCT screening will increase, and screening according to current guidelines may strain health resources. This strain will be further increased if the upper limit for screening is raised as the health and functional status of older adult continues to improve, making it possible for them to safely undergo potentially curative lung cancer surgery at an older age.

One strategy under consideration is to focus efforts on screening patients at highest risk. As noted in the table, high-risk patients are those with a strong family history of lung cancer, COPD, and/or with occupational and environmental exposures that predispose to lung cancer.

Risk modeling has been used to examine how best to target LDCT lung cancer screening. One important risk-modeling study, which addresses the concern about high false-positive screening results, divided subjects from the NLST into

References and Resources

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quintiles of 5-year risk of death from lung cancer. Risk level was based on age, pack-years of smoking, chronic lung disease, years since quitting smoking for those no longer smoking, and family history of lung cancer. The study showed that individuals with multiple risk factors had the greatest reduction in lung cancer deaths as a result of LDCT screening. They also had a lower false-positive screening rate and fewer screenings needed to prevent lung cancer death.

Individual Patient Considerations

Lung cancer screening is only appropriate for patients who can tolerate cancer treatment. Thus, older adults must be evaluated on an individual basis to consider factors such as frailty, physiologic reserve, co-morbidities, and fitness level. ([See Elder Care Disease Screening in Older Adults](#))

The good news, however, is that diagnostic testing and treatments for lung cancer have become safer, making them applicable to more and more patients. When performed by experienced teams, navigational bronchoscopies and CT-guided biopsies carry low rates of complications. Minimally invasive surgical procedures afford patients less pain and shorter hospital stays. Tailored chemotherapy and stereotactic body radiation therapy have resulted in fewer dose-limiting toxicities. But still, each patient should have a comprehensive evaluation before embarking on lung cancer screening and treatment.

Final Comment

The NLST has provided us with a great leap forward in the early detection of lung cancer and the subsequent prevention of lung cancer deaths. The Grade B recommendation from the USPSTF will soon make insurance coverage available for eligible patients in the US under guidelines of the Affordable Care Act. But, if efforts to detect and treat early-stage lung cancer are to succeed, it will be up to primary care clinicians and pulmonologists to implement appropriate screening for their older adult patients.

Interprofessional care improves the outcomes of older adults with complex health problems

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