

Lung cancer screening: Low-dose computed tomography

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In the United States this year, more than 200,000 individuals will be diagnosed with lung cancer and close to 160,000 individuals will die of lung cancer. Women represent half of both of these numbers. More than 50% of lung cancers will have distant metastasis at the time of diagnosis. The 5-year survival rate for these individuals is less than 5%, as compared with a 58% survival rate if cancer is detected while still localized to the lung.^{1,2} A screening program that can detect lung cancer at an early stage—when surgery can be curative—and that is designed to minimize harms associated with screening is highly desirable.



Findings from the National Lung Screening Trial (NLST) support the use of helical low-dose computed tomography (LDCT) for lung cancer screening in individuals at high risk for lung cancer.³ The NLST was an 8-year National Cancer Institute-funded randomized con-

trolled trial conducted from 2002 through 2009 to compare the effects of the use of LDCT versus standard chest radiography on lung cancer mortality rates in high-risk individuals.³ Participants were adults aged 55-74 years who had a 30-pack-year smoking history and currently smoked or had quit within the previous 15 years. More than 50,000 participants were screened with LDCT or chest radiography annually for 3 years. Data were collected on lung cancer occurrences and lung cancer-related deaths through 2009. The data demonstrated a 20% reduction in mortality from lung cancer among participants screened with LDCT versus those screened with chest radiography.

The U.S. Preventive Services Task Force (USPSTF) used modeling based on the NLST data to assess the potential benefits and harms of screening with LDCT for varying populations.⁴ In 2013, the USPSTF issued a recommendation for annual screening for lung cancer using LDCT in adults aged 55-80 years who have a 30-pack-year smoking history and currently smoke or have quit within the past 15 years.⁴ The American Cancer Society and the American College of Chest Physicians issued similar lung cancer screening recommendations in 2013.^{5,6} The only variance from the USPSTF recommendations was an upper age limit of 74 years instead of 80.

LDCT uses much less radiation than does standard CT. With LDCT, the x-ray sources follow a helical or spiral path around the patient, taking less than 1 minute to scan the entire chest. Computers create multiple thinly-sliced 2-dimensional images of the lungs from the x-ray information. Further evaluation is needed if LDCT reveals a pulmonary nodule. Nodules with low probability of cancer may be followed with repeat LDCT scans over a period of time to watch for nodule growth. Higher-dose LDCT, positron emission tomography, and biopsies are used to evaluate nodules with moderate or high probability for cancer.^{7,8}

The USPSTF has recommended standardization of LDCT screening and follow-up of abnormal findings, as well as development of a registry to collect data needed to enable continuous improvement in screening program quality over time.⁴ Several organizations have recommended that lung cancer screening and follow-up be conducted as part of a structured, high-volume,

high-quality program involving a multidisciplinary team skilled in evaluation and treatment of lung cancer. Such programs would use eligibility criteria consistent with USPSTF recommendations, have American College of Radiology (ACR) certification in CT, and participate in the ACR data registry program.⁷ In addition, these programs would include use of smoking cessation strategies and informed and shared decision making with patients before initial screening.

Benefits of lung cancer screening can be maximized and harms minimized when healthcare provider (HCPs) do the following:

- Limit screening to persons at high risk;
- Discontinue screening once a person has not smoked for 15 years or develops a health problem that substantially limits life expectancy or ability to have lung surgery;
- Use healthcare facilities that have ACR certification in CT and a multidisciplinary team with access to clinical resources to provide diagnosis, follow-up treatment, and long-term patient management related to lung cancer screening; and
- Avoid invasive follow-up procedures in patients with nodules identified as low probability. Instead, follow with repeat LDCT scans over a period of time to watch for nodule growth.^{7,8}

The Patient Protection and Affordable Care Act requires most health insurance plans to cover preventive services with no deductible or co-payment for the patient if the USPSTF grades the recommendation as A (strongly recommended) or B (recommended).⁹ Both tobacco cessation (graded A) and lung cancer screening with LDCT (graded B) would qualify for insurance coverage at no additional cost.

Medicare covers annual lung cancer screening with LDCT for beneficiaries aged 55-77 years who are asymptomatic (no signs or symptoms of lung cancer), have at least a 30-pack-year smoking history, and currently smoke or have quit smoking within the past 15 years. HCPs must document an initial lung cancer screening counseling visit that includes the following:

- Determination of eligibility for screening;
- Shared decision making, including the use of one or more decision aids, to include benefits and

harms of screening, follow-up diagnostic testing, over-diagnosis, false-positive rate, and total radiation exposure;

- Counseling on the importance of annual lung cancer screening; and
- Counseling on the importance of maintaining smoking abstinence if a former smoker and smoking cessation if a current smoker; and, if appropriate, providing information about smoking cessation interventions.¹⁰

In **Talking With Your Patients about Screening for Lung Cancer^A**, the USPSTF provides discussion points using three patient scenarios: patients who fit all screening criteria; patients who are outside the screening criteria; and patients who fit all screening criteria but have a significant co-morbid condition.¹¹ The National Comprehensive Cancer Network provides a booklet, **NCCN Guidelines for Patients[®]: Lung Cancer Screening^B** that can facilitate informed and shared decision making about screening.¹² The Association of Health Research and Quality's **Treating Tobacco Use and Dependence: 2008 Update^C** is a good resource on smoking cessation for HCPs.¹³

Annual lung cancer screening with LDCT cannot prevent cancer but can reduce lung cancer mortality through earlier diagnosis in individuals at high risk based on age and smoking history. Such screening is recommended along with continued efforts to prevent smoking and exposure to other lung cancer risk factors and to assist individuals with smoking cessation. ●

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Visit NPWomensHealthcare.com/?p=4354 for a complete list of references.

Web resources

- A. uspreventiveservicestaskforce.org/Home/GetFileByID/796
- B. nccn.org/patients/guidelines/lung_screening/index.html
- C. ahrq.gov/professionals/clinicians-providers/guidelines-recommendations/tobacco/index.html