KAISER PERMANENTE

Lung Cancer Screening Guideline

Last guideline approval: February 2022

Guidelines are systematically developed statements to assist patients and providers in choosing appropriate health care for specific clinical conditions. While guidelines are useful aids to assist providers in determining appropriate practices for many patients with specific clinical problems or prevention issues, guidelines are not meant to replace the clinical judgment of the individual provider or establish a standard of care. The recommendations contained in the guidelines may not be appropriate for use in all circumstances. The inclusion of a recommendation in a guideline does not imply coverage. A decision to adopt any particular recommendation must be made by the provider in light of the circumstances presented by the individual patient.

Major Changes as of February 2022

Annual lung cancer screening with low-dose computed tomography is now recommended for patients **aged 50 through 79** (previously 55 through 74) who meet **all three** of the following criteria:

- Have at least a **20-year** (previously 30-year) pack history, **and**
- Currently smoke or quit less than 15 years ago, **and**
- Have no significant comorbidities that would preclude surgical treatment or limit life expectancy.

Background

Lung cancer is the second most common cancer and the leading cause of cancer death in the United States. According to the U.S. Preventive Services Task Force (USPSTF), nearly 80% of individuals with lung cancer die of the disease within 5 years. However, when detected at an early stage, non–small cell lung cancer (NSCLC) has a better prognosis and can be treated with surgical resection. (The majority of lung cancer cases are NSCLC.)

The most important risk factor for lung cancer is smoking, which results in approximately 85% of all U.S. lung cancer cases. The incidence of lung cancer increases with age, occurring most commonly in individuals aged 55 years or older. Increasing age and cumulative exposure to tobacco smoke are the two factors most strongly associated with the occurrence of lung cancer.

The USPSTF found adequate evidence that **annual screening with low-dose computed tomography (LDCT) in current and former smokers aged 50 through 79 years who have significant cumulative tobacco smoke exposure can prevent a substantial number of lung cancer deaths.** LDCT has greater sensitivity for detecting early-stage cancer than chest X-ray and sputum cytology; however, it also has a very high rate of false positives (about 95%). For the benefits to outweigh the harms, **screening needs to be limited those who are at the highest risk for lung cancer.**

Prevention

While screening with LDCT can prevent some lung cancer deaths, it is important to emphasize to patients that **the single most effective way to reduce lung cancer risk is smoking cessation**. For every year patients don't smoke, their risk for lung cancer goes down.

For recommended interventions to help patients quit smoking, see the Tobacco and Nicotine Cessation Guideline.

Screening Recommendations

Screening: Key points for discussion

- Lung cancer screening is not a substitute for smoking cessation.
- Not all people who may be at risk for lung cancer will benefit from screening.
- Screening should be limited to those at highest risk for lung cancer, for whom the benefits are more likely to outweigh the harms.

Note: The screening criteria, as well as diagnosis codes, progress notes, LDCT order, and patient instructions are included in the KP HealthConnect SmartSet **Low Dose CT- Lung Cancer Screening.**

Initiation

Ages 50 through 79: Annual screening for lung cancer with low-dose computed tomography is recommended for patients who meet **all three** of the following criteria:

- Have at least a 20-year pack history, **and**
- Currently smoke or quit less than 15 years ago, **and**

- Have no significant comorbidities that would preclude surgical treatment or limit life expectancy.

Note: Patients ages 78 through 79 may incur out-of-pocket costs, as Medicare coverage for lung cancer screening currently stops at age 77.

Ages 80 and over: Annual lung cancer screening with LDCT is not recommended.

Discontinuation

Discontinuation of lung cancer screening is recommended at 15 years following the patient's quit date, or as appropriate for health status.

Things to consider before screening

Potential reasons to exclude patients from screening may include the following; use clinical judgment.

- Metallic implants or devices in the chest or back, such as pacemakers or Harrington fixation rods.
- Treatment for, or evidence of, any cancer other than nonmelanoma skin cancer or carcinoma in situ (with the exception of transitional cell carcinoma in situ or bladder carcinoma in situ) in the 5 years prior to eligibility assessment.
- History of lung cancer.
- Requirement for home oxygen supplementation.
- Unexplained weight loss of more than 15 pounds in the 12 months prior to eligibility assessment.
- Pneumonia or acute respiratory infection treated with antibiotics in the 12 weeks prior to eligibility assessment.
- Chest CT examination in the 12 months prior to eligibility assessment.
- Patient is not a candidate for surgical treatment.

Shared Decision-Making

Table 1. Shared decision-making regarding lung cancer screening

Advantages/benefits	Disadvantages/risks
• For high-risk patients, screening can provide some hope for prevention of death from lung cancer by detecting lesions when they are most treatable. • With screening, about 39 of 1,000 people (3.9%) will have lung cancer found. Without screening, about 32 of 1,000 people (3.2%) will have lung cancer found. • About 4 out of 1,000 people (0.4%) avoid death from lung cancer with screening.	• 177 out of 1,000 people (1.7%) will have a false-positive, which may lead to anxiety and unnecessary follow-up tests and surgeries that pose risks to the patient. • 7 out of 1,000 people (0.7%) will be diagnosed with lung cancer that may never have caused a problem for the patient and lead to treatment that is not needed and can be harmful (overdiagnosis). • Radiation from repeated LDCT tests can cause cancer in otherwise healthy people. The radiation dose from LDCT is about 20 times higher than a chest X-ray.

KPWA HealthConnect tools to support shared decision-making

- **Lung Cancer Screening: Should I Have It? (patient decision grid)**
- **Lung Cancer Screening (risk calculator)**
- **Lung cancer screening: Helping you make a decision**

Pulmonary Nodule Work-up/Referrals

Asymptomatic, high-risk patients who choose to be screened will undergo lung cancer screening with LDCT. The radiologist's report will follow standardized LDCT reporting and management recommendations developed by the American College of Radiology (ACR) using the ACR Lung Imaging Reporting and Data System (**Lung-RADS™**). The Lung-RADS system was designed to reduce confusion in interpreting screening results by standardizing the language used to describe pulmonary nodules and by providing detailed, specific guidance for follow-up.

The radiologist's report for the LDCT scan will include these recommendations tailored to each patient's individual LDCT findings. The findings will be categorized depending on number, size and other nodule characteristics. Management and follow-up for patients will be based on category, as shown in Table 2.

For more information on nodule categorization by size and other characteristics, see the ACR website at https://www.acr.org/Clinical-Resources/Reporting-and-Data-Systems/Lung-Rads. Go directly to the assessment categories list: https://www.acr.org/-/media/ACR/Files/RADS/Lung-RADS/Lung-RADS-2022.pdf.

Table 2. Lung-RADS™ assessment categories and management

Category	Description	Probability of malignancy	Management
0 Incomplete	Additional lung cancer screening CT images and/or comparison to prior chest CT examinations is needed.	N/A	N/A
1 Negative	No nodules and definitely benign nodules.	< 1%	Continue annual screening with LDCT in 12 months.
2 Benign appearance or behavior	Nodules with a very low likelihood of becoming a clinically active cancer due to size or lack of growth.	< 1%	Continue annual screening with LDCT in 12 months.
3 Probably benign	Probably benign finding; short-term follow-up suggested. Includes nodules with a low likelihood of becoming a clinically active cancer.	1–2%	Repeat LDCT in 6 months.
4a, 4b, or 4x Suspicious to very suspicious	Findings for which additional diagnostic testing and/or tissue sampling is recommended.	4a: 5–15% 4b or 4x: > 15%	Refer to Pulmonology.

Incidental findings

- Emphysema: Consider pulmonary function testing.
- Bronchiectasis or pulmonary fibrosis: Consider virtual consult with Pulmonary to review CT images.
- Aortic dilation: Consider virtual consult with Cardiology.
- Pericardial effusion: Consider echocardiogram for large pericardial effusion.

Evidence Summary

To develop the Lung Cancer Screening Guideline, the guideline team adapted the recommendations from the following national guidelines:

Screening for Lung Cancer: U.S. Preventive Services Task Force Final Recommendation Statement (USPSTF 2021)

References

American College of Radiology. *Lung CT Screening Reporting and Data System (Lung-RADS™)* online at https://www.acr.org/Clinical-Resources/Reporting-and-Data-Systems/Lung-Rads. Accessed December 6, 2021.

USPSTF. Screening for Lung Cancer: U.S. Preventive Services Task Force Recommendation Statement. *JAMA.* 2021;325(10): 962-970.

Guideline Development Process and Team

Development process

To develop the Lung Cancer Screening Guideline, the guideline team adapted recommendations from externally developed evidence-based guidelines and/or recommendations of organizations that establish community standards.

This edition of the guideline was approved for publication by the Guideline Oversight Group in February 2022.

Team

The Lung Cancer Screening Guideline development team included representatives from the following specialties: internal medicine, oncology, primary care, pulmonology, and radiology.

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