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Release date: July 10, 2022; Expiration date: July 10, 2023

Learning Objectives:

Upon completion of this activity, participants will be able to:

- Integrate into professional practice the updates to the NCCN Guidelines for Lung Cancer Screening
- Describe the rationale behind the decision-making process for developing the NCCN Guidelines for Lung Cancer Screening

Disclosure of Relevant Financial Relationships

None of the planners for this educational activity have relevant financial relationship(s) to disclose with ineligible companies whose primary business is producing, marketing, selling, reselling, or distributing healthcare products used by or on patients.

Individuals Who Provided Content Development and/or Authorship Assistance:

The faculty listed below have no relevant financial relationship(s) with ineligible companies to disclose.
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Jacob Sands, MD, Panel Member, has disclosed consulting/serving on a scientific advisory board for AstraZeneca Pharmaceuticals LP, Blueprint Medicines, Curadev Pharma PL, Daiichi-Sankyo Co., Jazz Pharmaceuticals Inc., Medtronic, Inc., PharmaMar, and Takeda Pharmaceuticals North America, Inc.

To view all of the conflicts of interest for the NCCN Guidelines panel, go to NCCN.org/guidelines/guidelines-panels-and-disclosure/disclosure-panels

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Lung Cancer Screening, Version 1.2022

Featured Updates to the NCCN Guidelines

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ABSTRACT

The NCCN Guidelines for Lung Cancer Screening recommend criteria for selecting individuals for screening and provide recommendations for evaluation and follow-up of lung nodules found during initial and subsequent screening. These NCCN Guidelines Insights focus on recent updates to the NCCN Guidelines for Lung Cancer Screening.

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*Provided content development and/or authorship assistance.

NCCN CATEGORIES OF EVIDENCE AND CONSENSUS

Category 1: Based upon high-level evidence, there is uniform NCCN consensus that the intervention is appropriate.

Category 2A: Based upon lower-level evidence, there is uniform NCCN consensus that the intervention is appropriate.

Category 2B: Based upon lower-level evidence, there is NCCN consensus that the intervention is appropriate.

Category 3: Based upon any level of evidence, there is major NCCN disagreement that the intervention is appropriate.

All recommendations are category 2A unless otherwise noted.

Clinical trials: NCCN believes that the best management of any patient with cancer is in a clinical trial. Participation in clinical trials is especially encouraged.

PLEASE NOTE

The NCCN Clinical Practice Guidelines in Oncology (NCCN Guidelines®) are a statement of evidence and consensus of the authors regarding their views of currently accepted approaches to treatment. **The NCCN Guidelines Insights highlight important changes in the NCCN Guidelines recommendations from previous versions. Colored markings in the algorithm show changes and the discussion aims to further the understanding of these changes by summarizing salient portions of the panel's discussion, including the literature reviewed.**

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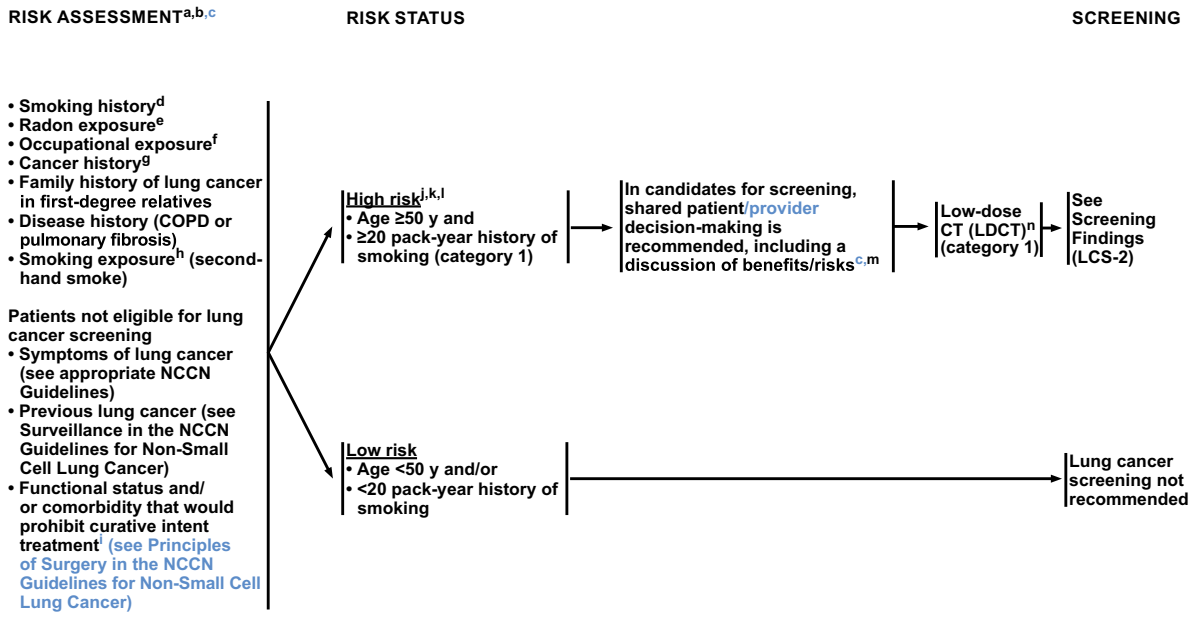


Overview

Well-known risk factors exist for the development of lung cancer, especially smoking tobacco.[1–4] Lung cancer is the leading cause of cancer-related mortality in the United States and worldwide.[3,5–7] In 2022, an estimated 236,740 new cases (117,910 in men and 118,830 in women) of lung and bronchial cancer will be diagnosed, and 130,180 deaths (68,820 in men and 61,360 in women) are estimated to occur in the United States due to the disease, which is approximately 21% of all the US deaths from cancer.[8] Five-year survival rates for lung cancer are only 22.9%, partly because most patients have advanced-stage lung cancer at initial diagnosis.[9] Early detection of lung cancer is an important opportunity for decreasing mortality. Ideally, effective screening will lead to earlier detection of lung cancer—before patients have symptoms and when treatment is more likely to be effective—and will decrease mortality.[3] Data support using low-dose CT (LDCT) of the chest to screen select patients who are at high risk for lung cancer.[10–13] Chest radiography is not recommended for lung cancer screening.[11,14–17]

The NCCN Clinical Practice Guidelines in Oncology (NCCN Guidelines) for Lung Cancer Screening were developed in 2011 and have been subsequently updated at least once every year.[11,18–20] These NCCN Guidelines describe risk factors for lung cancer, discuss the benefits and risks of LDCT screening, recommend criteria for selecting individuals for screening, provide recommendations for evaluation and follow-up of lung nodules found during initial and subsequent screening, and discuss the accuracy of chest LDCT screening protocols and imaging modalities.[20]

These NCCN Guidelines Insights focus on recent updates in the NCCN Guidelines for Lung Cancer Screening from 2022 and 2021 (see LCS-1, LCS-1A, LCS-3, LCS-3A, LCS-5, pages 756–760, respectively). For a complete list of the recent updates to these guidelines for 2022, see "Summary of the Guidelines Updates" in the complete version of the NCCN Guidelines for Lung Cancer Screening (available at NCCN.org). The NCCN Guidelines Insights explain, in greater detail than the parent NCCN Guidelines, the reasons why the panel members recently revised the guidelines and provide a valuable resource for busy healthcare providers who need to quickly learn about the recent recommendations to determine whether their patients are candidates for lung cancer screening.

Clinical Trial Data

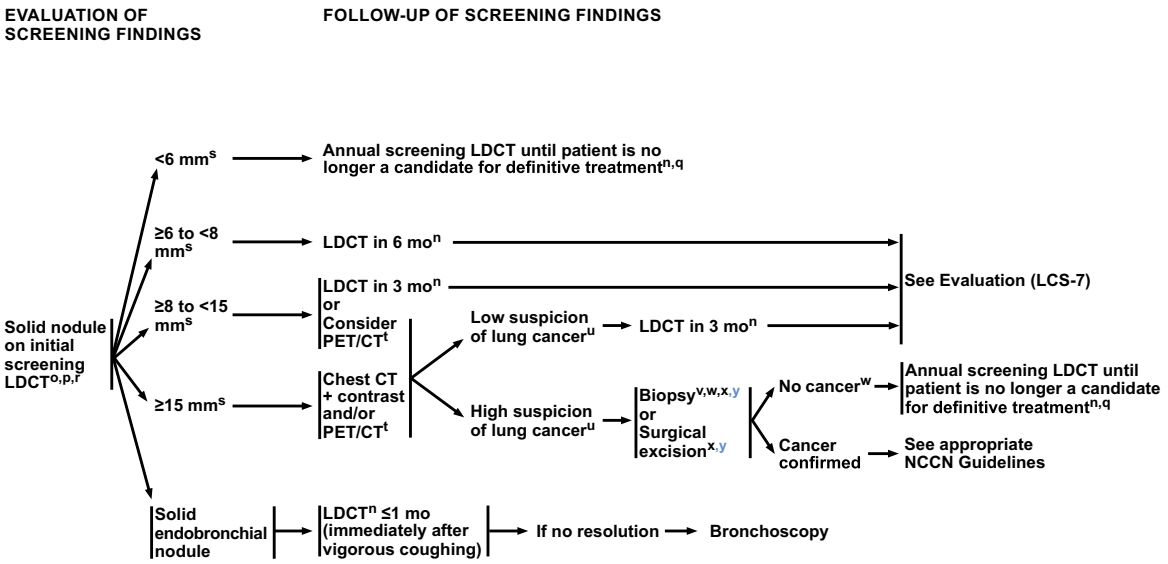
Multiple randomized trials have assessed LDCT screening for lung cancer among high-risk groups, including (1) the National Lung Screening Trial (NLST), sponsored by the NCI; (2) the Nederlands-Leuvens Longkanker Screenings

Footnotes

[a] It is recommended that institutions performing lung cancer screening use a multidisciplinary approach that includes the specialties of thoracic radiology, pulmonary medicine, and thoracic surgery.
[b] Lung cancer screening is appropriate to consider for high-risk patients who are potential candidates for definitive treatment. Chest x-ray is not recommended for lung cancer screening.
[c] Although age and smoking history are used for risk assessment, other potential risk factors for lung cancer (eg, occupational exposure, radon exposure, cancer history family history, lung disease history) may be discussed during shared decision-making.
[d] All current smokers should be advised to quit smoking, and former smokers should be advised to remain abstinent from smoking. For additional cessation support and resources, smokers can be referred to https://www.smokefree.gov. Lung cancer screening should not be considered a substitute for smoking cessation. Smoking history should document both extent of exposure in pack-years and the amount of time since smoking cessation in former smokers. See also the NCCN Guidelines for Smoking Cessation.
[e] Documented sustained and substantially elevated radon exposure.
[f] Agents that are identified specifically as carcinogens targeting the lungs include: silica, cadmium, asbestos, arsenic, beryllium, chromium, diesel fumes, nickel, coal smoke, and soot.
[g] There is increased risk of developing new primary lung cancer among survivors of lymphomas, cancers of the head and neck, or smoking-related cancers.
[h] Individuals exposed to second-hand smoke have a highly variable exposure to the carcinogens, with varying evidence for increased risk after this variable exposure. Therefore, second-hand smoke is not independently considered a risk factor sufficient for recommending lung cancer screening.
[i] Curative intent treatment includes surgery, stereotactic body radiation therapy (SBRT), or ablation. SBRT or ablation may be used for medically inoperable patients with cardiac disease or severe chronic obstructive pulmonary disease (COPD).
[j] Although randomized trial evidence supports screening up to age 77 years, there is uncertainty about the upper age limit to initiate or continue screening. One can consider screening beyond age 77 years as long as patient functional status and comorbidity allow consideration for curative intent therapy.
[k] It has been shown that African–American smokers with less smoking exposure have a similar risk for lung cancer as white smokers with higher smoking exposure. This increased risk for African–Americans should be considered in shared decision-making and risk assessment. Aldrich M, et al. JAMA Oncol 2019;5:1318-1324.
[l] See Tammemagi lung cancer risk calculator.
[m] Shared decision-making aids may assist in determining if screening should be performed. Examples of decision-making aids can be found at: http://www.shouldiscreen.com/benefits-and-harms-screening.
[n] All screening and follow-up chest CT scans should be performed at low dose (100–120 kVp and ≤40–60 mAs), unless evaluating mediastinal abnormalities or lymph nodes, where standard-dose CT with IV contrast might be appropriate (see LCS-A). There should be a systematic process for appropriate follow-up.

Onderzoek (NELSON); (3) the Multicentric Italian Lung Detection (MILD); (4) the UK Lung Screen (UKLS); (5) the Danish Lung Cancer Screening Trial (DLCST); and (6) the Detection And screening of early lung cancer with Novel imaging Technology (DANTE) trials.[10,12,13,21–38] Data from the larger clinical trials—NLST, NELSON, and MILD—support screening select individuals who are at high risk for lung cancer.[10–13] The NLST assessed screening with chest LDCT versus chest radiography in 53,454 current and former smokers aged 55 to 74 years at high risk for lung cancer using 3 rounds of annual screening; LDCT decreased the relative risk of death from lung cancer by 20% (95% CI, 6.8–26.7; P=.004) compared with chest radiography.[11] The number needed to screen (NNS) to prevent one lung cancer death was 323 over 6.5 years of follow-up.[39] Extended follow-up of the NLST showed an NNS of 303.[12] Although the NLST also reported a significant decrease in all-cause mortality, this decrease was largely attributable to lower lung cancer mortality.

The NELSON trial assessed LDCT screening (4 rounds) versus no screening in 13,195 men and 2,594 women aged 50 to 74 years at high risk for lung cancer who were current and former smokers. Data from the NELSON trial show that LDCT decreased lung cancer mortality in both men and women at high risk for lung cancer compared with no screening.[10] After 10 years, lung cancer mortality with LDCT screening was 26% lower in men and 39% lower in women compared with the no screening group.[10] The NNS to prevent one lung cancer death was 130 over 10 years of follow-up.[39] The NELSON trial used volume-based LDCT screening and classified scans as "indeterminate" when short-term follow-up was indicated, delaying the classification as "positive" or "negative" scans.[10] The use of "indeterminate" reduced the number of scans considered to be false-positive, but resulted in similar metrics to Lung Imaging Reporting and Data System (Lung-RADS) (see "Lung Screening Program" section on page 761 for content about Lung-RADS). Although the NELSON publication reports a reduction in false-positive results, this reduction is due to the use of an indeterminate classification until a follow-up study is completed.[10] At the time of the follow-up study, "positive" or "negative" is then assigned rather than being classified as positive at the time of the initial scan. Although this method reduced false-positive scans, this reduction is based on classification rather than any actual differences in scan metrics. The MILD trial assessed LDCT screening (annual or biennial) versus no screening in 4,099 adults aged 49 to 75 years with a ≥20 pack-year smoking history.[13] After 10 years of screening, the LDCT arm yielded a 39% decreased risk of lung cancer mortality (hazard ratio [HR], 0.61; 95% CI, 0.39–0.95) and a 20% decrease in all-cause mortality. The



benefit of screening improved beyond the fifth year, with a 58% decreased risk of lung cancer mortality (HR, 0.42; 95% CI, 0.22–0.79).

Selection of Individuals for Lung Screening

Originally, the NCCN Guidelines recommended LDCT screening for 2 high-risk groups. Group 1 included individuals aged 55 to 77 years with a ≥30 pack-year history of smoking tobacco who currently smoked or, if a former smoker, had quit within 15 years (category 1), which was based on the NLST inclusion criteria.[11] Group 2 included individuals aged ≥50 years with a ≥20 pack-year history of smoking tobacco who were either current or former smokers with at least one additional risk factor, such as occupational exposure to lung carcinogens.[40] The NCCN Guidelines have a 10-year history of recommending lung screening for individuals in the previous group 2. In 2020, the NCCN panel consolidated these 2 groups into one high-risk group and elevated the LDCT screening recommendation to category 1 (see LCS-1, page 756).[41] In 2013, the US Preventive Services Task Force (USPSTF) recommended lung screening for adults aged 55 to 80 years with a 30 pack-year smoking history who currently smoked or had quit within the last 15 years.[14] In 2021, USPSTF revised their LDCT screening recommendations to include adults aged 50 to 80 years with a 20 pack-year smoking history who currently smoked or had quit within the last 15 years,[42] aligning more closely with the NCCN Guidelines.

Currently, the NCCN Lung Cancer Screening Panel recommends lung cancer screening using LDCT (category 1) for individuals with high-risk factors based on clinical trial data.[10–13] Individuals are at high risk for lung cancer if they are aged ≥50 years with a ≥20 pack-year history of smoking tobacco (see LCS-1, page 756). Previous NCCN recommendations had been based primarily on the NLST. However, since the very first guideline in 2011, NCCN has also recommended screening for the additional group of individuals aged ≥50 years with smoking exposure of ≥20 pack-years if they also had an additional risk factor for lung cancer. This additional group was included because the panel considered that limiting screening to the NLST inclusion criteria alone was arbitrary and incomplete, given that the NLST only used age and smoking history for inclusion criteria and did not consider other well-known risk factors for lung cancer. Others share this opinion.[42–45] Using the narrow NLST criteria—individuals aged 55 to 77 years with a ≥30 pack-year smoking history—only 27% of patients being diagnosed with lung cancer would be candidates for LDCT screening.[46] The panel decided that it was important to expand screening beyond the NLST criteria to be

Footnotes

[n] All screening and follow-up chest CT scans should be performed at low dose (100–120 kVp and ≤40–60 mAs), unless evaluating mediastinal abnormalities or lymph nodes, where standard-dose CT with IV contrast might be appropriate (see LCS-A). There should be a systematic process for appropriate follow-up.
[o] The NCCN Guidelines for Lung Cancer Screening are harmonized with Lung-RADS with rounding of measurement to the nearest whole number (mm). https://www.acr.org/-/media/ACR/Files/RADS/Lung-RADS/LungRADSAssessmentCategoriesv1-1.pdf.
[p] Without benign pattern of calcification, fat in nodule suggestive of hamartoma, or features suggesting inflammatory etiology. When multiple nodules or other findings are present that suggest occult infection or inflammation is a possibility, suggest follow-up LDCT in 1–3 months.
[q] There is uncertainty about the appropriate duration of screening and the age at which screening is no longer appropriate.
[r] A nodule is a rounded opacity, measuring up to 3 cm in diameter. A solid nodule has a homogeneous soft-tissue attenuation, a ground-glass nodule (also known as a nonsolid nodule) has hazy increased attenuation that does not obliterate bronchial and vascular margins, and a part-solid nodule has elements of both solid and ground-glass nodules. Nodules should be evaluated and measured on CT using lung windows. The size of all nodules is underestimated when viewed on soft-tissue windows, and some nodules may not even be visible, particularly ground-glass nodules and small nodules. Bankier AA, et al. Radiology 2017;285:584-600.
[s] Nodules should be measured on lung windows and reported as the average diameter rounded to the nearest whole number; for round nodules only a single diameter measurement is necessary. Mean diameter is the mean of the longest diameter of the nodule and its perpendicular diameter.
[t] PET has a low sensitivity for nodules with <8 mm of solid component and for small nodules near the diaphragm. PET/CT is only one consideration of multiple criteria for determining whether a nodule has a high risk of being lung cancer. In areas endemic for fungal disease, the false-positive rate for PET/CT is higher.
[u] The evaluation for the suspicion of lung cancer requires a multidisciplinary approach with expertise in lung nodule management (thoracic radiology, pulmonary medicine, and thoracic surgery). This may include use of a lung nodule risk calculator to assist with probability determination. Examples of lung nodule risk calculators include: Mayo risk model; Brock university model; and model by Herder GJ, et al. Chest 2005;128:2490-2496. The use of risk calculators does not replace multidisciplinary nodule management. Geographic and other factors can substantially influence the accuracy of nodule calculators.
[v] Tissue samples need to be adequate for both histology and molecular testing. Travis WD, et al. In: WHO Classification of Thoracic Tumors, 5th Ed. Lyon: International Agency for Research on Cancer; 2021:29-36.
[w] If biopsy is non-diagnostic and a strong suspicion for cancer persists, suggest repeat biopsy, surgical excision, or short-interval LDCT follow-up (3 months).
[x] See the diagnostic evaluation of a lung nodule (DIAG-1 through DIAG-A) in the NCCN Guidelines for Non-Small Cell Lung Cancer.
[y] In many cases, patients with a strong clinical suspicion of stage I or II lung cancer (based on risk factors and radiologic appearance) do not require a biopsy before surgery. A biopsy adds time, cost, and procedural risk and is frequently unnecessary for treatment decisions. A preoperative biopsy may be preferred by the surgeon and/or patient prior to surgery. A preoperative biopsy may be appropriate if a non-lung cancer diagnosis is strongly suspected, which can be diagnosed by bronchoscopy, percutaneous core biopsy, or fine-needle aspiration (FNA), or if an intraoperative diagnosis appears difficult or very risky. When a preoperative tissue diagnosis has not been obtained, an intraoperative procedure (ie, wedge resection or needle biopsy) should be performed to confirm a cancer diagnosis before proceeding with lobectomy, bilobectomy, or pneumonectomy. See Principles of Diagnostic Evaluation in the NCCN Guidelines for Non-Small Lung Cancer.

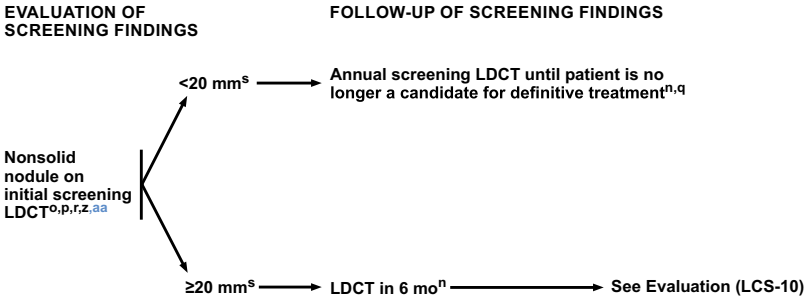
LCS-3A

inclusive of a larger group of individuals at risk for lung cancer.[46,47]

Based on additional evidence from the NELSON and MILD trials, the panel combined the previous 2 groups and levels of recommendations into a simplified and expanded age range for lung screening to ≥50 years and smoking history of ≥20 pack-years.[10,13,42,48] Data suggest that the lung cancer risk for individuals with a 20 to 29 pack-year smoking history is similar to that of individuals with a ≥30 pack-year history, and thus this group has also been included in screening recommendations by NCCN.[48] In the NCCN Guidelines, the age range for LDCT was expanded to ≥50 years for several reasons. The panel recognizes that younger individuals are also at high risk for lung cancer based on data from several studies. Three phase III randomized trials assessed screening in patients aged 50 to 55 years. The NELSON and UKLS screening trials assessed LDCT in adults aged 50 to 75 years.[10,25] The DLCST screened adults aged 50 to 70 years.[27,49,50] Several studies have assessed LDCT using an extended age range of 50 to 85 years.[51–53] Data suggest that decreasing the age and smoking history cutoffs will help reduce disparities in LDCT screening for Black/African Americans.[54,55]

Finally, the NCCN panel decided not to include an upper age cutoff for lung cancer screening, determining that eligibility for screening should be contingent on eligibility for treatment, rather than on an arbitrary chronologic age. Approximately 27% of lung cancer is diagnosed in older patients aged 75 to 84 years, and 9.4% occurs in patients aged >84 years.[9,56,57] Annual LDCT screening is recommended to continue for eligible individuals at high risk until they are no longer candidates for definitive treatment.[58,59] Determining factors to consider include functional status, comorbidities that could impede curative treatment, and an individual's interest and willingness to undergo treatment. Although randomized trial data support screening up to age 77 years, uncertainty exists about the appropriate duration of screening and the age at which screening is no longer appropriate.[60,61] By expanding lung cancer screening criteria to include groups at high risk—individuals aged ≥50 years with a ≥20 pack-year smoking history—thousands of additional lives may be saved.[47,56,62–64]

Lung cancer screening recommendations from USPSTF and the Centers for Medicare & Medicaid Services (CMS) restrict coverage of screening for lung cancer to adults who are currently smoking or have quit within the past 15 years.[42] The NCCN panel does not agree with this 15-year restriction, although acknowledging that the cessation of tobacco smoking decreases the risk for lung cancer. However, even former smokers have a higher risk



[n] All screening and follow-up chest CT scans should be performed at low dose (100–120 kVp and ≤40–60 mAs), unless evaluating mediastinal abnormalities or lymph nodes, where standard-dose CT with IV contrast might be appropriate (see LCS-A). There should be a systematic process for appropriate follow-up.
[o] The NCCN Guidelines for Lung Cancer Screening are harmonized with Lung-RADS with rounding of measurement to the nearest whole number (mm). https://www.acr.org/-/media/ACR/Files/RADS/Lung-RADS/LungRADSAssessmentCategoriesv1-1.pdf.
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[s] Nodules should be measured on lung windows and reported as the average diameter rounded to the nearest whole number; for round nodules only a single diameter measurement is necessary. Mean diameter is the mean of the longest diameter of the nodule and its perpendicular diameter.
[z] It is crucial that all nonsolid lesions be reviewed at thin (<1.5 mm) slices to exclude any solid components. Any solid component in the nodule requires management of the lesion with the part-solid recommendations (see LCS-9).
[aa] Lung-RADS 1.1 has increased the size of a non-solid nodule that can continue with annual screening to <30 mm, rather than <20 mm as recommended in the previous version. The NCCN Guidelines Panel has not harmonized this portion of the Lung-RADS update, as the panel members feel that baseline or new non-solid nodules ≥20 mm should have an earlier evaluation at 6 months. Hammer MM, et al. Radiology 2021;300:586-593.

LCS-5

for lung cancer compared with individuals who have never smoked. There is not a substantive drop off in that risk after 15 years since quitting (YSQ). An analysis of the Framingham Heart Study found that lung cancer risk remains >3-fold higher in former smokers after 25 YSQ than in never smokers, and 4 of 10 lung cancers occurred in former smokers with >15 YSQ.[65] Another study reported that former smokers had an elevated lung cancer risk (relative risk, 6.6; 95% CI, 5.0–8.7) up to 30 years after smoking cessation.[66] A prospective study evaluated patients with lung cancer who would have "missed out" on lung cancer screening using the 2013 USPSTF recommendations. By far, the largest percentage of those patients with lung cancer who were not eligible for screening based on the 2013 USPSTF criteria were due solely to having quit smoking for >15 years.[67] The NCCN panel has not placed a time limit for screening eligibility after smoking cessation, because the 15-year restriction is not based on or justified by evidence. Further, this restriction creates unintended consequences and a paradox of incentives for former smokers who wish to undergo or continue lung cancer screening. As a consequence of this 15-year restriction, individuals may be unintentionally encouraged to resume smoking, or to lie about their smoking history, to remain eligible for screening.

The NCCN Lung Cancer Screening Panel used the NLST and NELSON inclusion criteria, nonrandomized studies, and/or observational studies to develop the NCCN risk categories.[10–13] Screening with LDCT is only recommended for select individuals at high risk for lung cancer if they are potential candidates for curative-intent therapy (see LCS-1 and LCS-1A, pages 756 and 757, respectively); individuals at moderate or low risk should not be screened. For the 2022 update (Version 1), the NCCN panel clarified that curative-intent therapy includes surgery, stereotactic body radiation therapy (SBRT), or ablation. SBRT or ablation are recommended for patients who are medically inoperable or decline surgery. Individuals with extensive frailty and/or comorbidity are not candidates for lung cancer screening if they are not candidates for curative-intent therapy. The initial risk assessment before screening needs to include an assessment of functional status to determine whether patients can tolerate curative-intent treatment if they are found to have lung cancer. Individuals with previously treated cancers other than lung cancer are candidates for lung screening if they have high-risk criteria for age and smoking history, good functional status, and can tolerate curative-intent therapy if needed. Patients previously treated for lung cancer are under surveillance indefinitely until they are also no longer eligible for treatment (see

"Surveillance" in the NCCN Guidelines for Non–Small Cell Lung Cancer, available at NCCN.org). Although similar to lung screening, surveillance after treatment of lung cancer is not addressed in the NCCN Guidelines for Lung Cancer Screening.

Analyses of some lung cancer screening studies using LDCT scans suggest that overdiagnosis (ie, diagnosis of cancer that would never be life-threatening) and false-positive screening tests are significant concerns.[68–70] When assessing subsequent scans, the most important radiologic factors are resolution, stability, or growth of a previous nodule(s) or appearance of a new nodule(s) when compared with a previous imaging study. Rapid increase in nodule size suggests an inflammatory etiology or malignancy other than non–small cell lung cancer. Data from the NELSON trial indicate that new solid nodules found during subsequent CT screening are more likely to be lung cancer than solid nodules found at baseline screening.[23] Approximately 44% of new solid nodules (50–500 mm^3) did not resolve, and 10% of them were cancer, whereas only 3% of nonresolving solid nodules at baseline were lung cancer.[23] Thus, new solid nodules need to be followed more aggressively than baseline solid nodules.[23]

Lung Screening Program

Lung cancer screening with LDCT should be part of a program of care and should not be performed in isolation as a free-standing test.[71–74] Trained personnel and an organized administrative system to contact patients to achieve compliance with recommended follow-up studies are required for an effective lung screening program.[73,75,76] The NCCN-recommended follow-up intervals assume compliance with follow-up recommendations. To help ensure good image quality, all chest LDCT screening programs should use CT scanners that meet the standards of the American College of Radiology (ACR).[77] The ACR has developed Lung-RADS to standardize the reporting and management of LDCT lung examinations.[64,71,78–80] The Lung-RADS protocol has been shown to improve the detection of lung cancer and to decrease the false-positive rate.[73,75,78,79,81–84] Previously, the panel harmonized Lung-RADS with the NCCN Guidelines for Lung Cancer Screening by revising the nodule management algorithm for screen-detected lung nodules.[78] The NCCN threshold cutoffs for solid, part-solid, and nonsolid nodules have been rounded to the nearest whole number to harmonize with the Lung-RADS cutoffs for most of the nodules (see LCS-3 and LCS-3A, pages 758 and 759, respectively).[64,71,80] For the 2022 update (Version 1), the NCCN panel decided to continue using a cutoff for nonsolid nodules of 20 mm and to not use the Lung-RADS 1.1 cutoff of 30 mm (see LCS-5, page 760).[80,85] The panel decided that baseline or new nonsolid nodules of ≥20 mm should have an earlier evaluation at 6 months.[86]

As with any screening test, the risks and benefits should be discussed with the patient before an initial screening LDCT scan is performed.[60,87–89] Shared patient/provider decision-making may be the best approach before deciding whether to perform LDCT lung screening, especially for patients with comorbid conditions.[14,90,91] Data suggest that Black/African American smokers are at greater risk for lung cancer than White smokers who have the same smoking history.[54,55] This increased risk for Black/African Americans should be considered in shared decision-making and risk assessment. It is recommended that institutions performing lung cancer screening use a multidisciplinary approach to program management that may include specialties such as chest radiology, pulmonary medicine, and thoracic surgery.[92] Guidelines from the American College of Chest Physicians and ASCO state that only centers with considerable expertise should be offering LDCT scans of the chest for lung cancer screening.[93]

Summary

Data support using LDCT of the chest to screen select patients who are at high risk for lung cancer.[10–13] Chest radiography is not recommended for lung cancer screening.[11,14–17] The NCCN Guidelines for Lung Cancer Screening recommend criteria for selecting individuals for LDCT screening and provide recommendations for evaluation and follow-up of lung nodules found during initial and subsequent screening.[20]

These NCCN Guidelines Insights focus on recent updates for the NCCN Guidelines for Lung Cancer Screening. The panel recommends lung cancer screening using LDCT (category 1) for individuals with high-risk factors based on clinical trial data.[10–13,21] Individuals are high risk if they are aged ≥50 years with a ≥20 pack-year history of smoking tobacco (see LCS-1, page 756). The NCCN panel previously expanded the age range cutoff for lung screening to ≥50 years to ensure that more individuals would be screened based on the NELSON trial and other data.[10,13,42] The panel also decreased the smoking history cutoff to ≥20 pack years.[48,65,67] Screening with LDCT should be recommended for select individuals at high risk if they are potential candidates for curative-intent therapy. For the 2022 update (Version 1), the panel clarified that curative-intent therapy includes surgery, SBRT, or ablation. SBRT or ablation are recommended for patients who are medically inoperable or decline surgery. LDCT screening is not recommended for individuals with functional status or comorbidity that would prohibit curative-intent therapy.

The Lung-RADS protocol has been shown to improve the detection of lung cancer and to decrease the false-

positive rate.[73,75,78,79,81–84] The NCCN threshold cutoffs for solid, part-solid, and nonsolid nodules have been rounded to the nearest whole number to harmonize with the Lung-RADS cutoffs for most of the nodules.[64,71,80] For the 2022 update (Version 1), however, the panel decided to continue using a cutoff for nonsolid nodules of 20 mm rather than the Lung-RADS 1.1 cutoff of 30 mm (see LCS-5, page 760).[80,85] The panel recommends that baseline or new nonsolid nodules of ≥20 mm should have an earlier evaluation at 6 months.[86]

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