National Comprehensive Cancer Network®

2026

NCCN Guidelines for Patients®

Cancer care recommendations from leading experts at the National Comprehensive Cancer Network® (NCCN®)

Lung Cancer Screening



Presented with support from NCCN FOUNDATION Guiding Treatment. Changing Lives.

Available online at NCCN.org/patientguidelines



NCCN Guidelines for Patients®

The essential guide for people facing cancer.

Based on care recommendations from leading cancer experts.

Explains high-quality cancer care provided at state-of-the-art cancer centers.

Reviewed and revised every year.

Did you know that top cancer centers across the United States work together to improve cancer care? This alliance of leading cancer centers is called the National Comprehensive Cancer Network® (NCCN®).

Because cancer care is always evolving, NCCN develops and frequently updates evidence-based cancer care recommendations used by health care providers worldwide. These recommendations are known as the NCCN Clinical Practice Guidelines in Oncology (NCCN Guidelines®).

The NCCN Guidelines for Patients plainly explain these expert recommendations, so you can talk with your care team about the best care for you.

These NCCN Guidelines for Patients are based on the NCCN Guidelines® for Lung Cancer Screening Version 1.2026 — September 16, 2025.

View the NCCN Guidelines for Patients free online: NCCN.org/patientguidelines

Find an NCCN Cancer Center near you: NCCN.org/cancercenters

Learn how the NCCN Guidelines for Patients are developed: NCCN.org/patient-guidelines-process

Connect with us


@NCCNorg


@NCCNVideo


NCCN


@NCCNorg

Supporters

NCCN NATIONAL COMPREHENSIVE CANCER NETWORK® FOUNDATION
Guiding Treatment. Changing Lives.

NCCN Guidelines for Patients are supported by funding from the NCCN Foundation®

NCCN Foundation gratefully acknowledges the following corporate supporters for helping to make available these NCCN Guidelines for Patients: AstraZeneca and Lilly.

NCCN independently adapts, updates, and hosts the NCCN Guidelines for Patients. Our corporate supporters do not participate in the development of the NCCN Guidelines for Patients and are not responsible for the content and recommendations contained therein.

To make a gift, visit
NCCNFoundation.org/Donate

To learn more, visit online
NCCN.org/patientguidelines
or email
PatientGuidelines@NCCN.org

Contents

4 Chapter 1
About lung cancer screening

7 Chapter 2
Deciding to start lung cancer screening

15 Chapter 3
Getting the first screening scan

25 Chapter 4
Next steps of care for a solid lung nodule

31 Chapter 5
Next steps of care for a nonsolid lung nodule

35 Chapter 6
Next steps of care for a part-solid lung nodule

40 Chapter 7
Testing for lung cancer

45 Chapter 8
Other resources

49 Words to know

51 NCCN Contributors

52 NCCN Cancer Centers

54 Index

©2026 National Comprehensive Cancer Network, Inc. All rights reserved.

NCCN Guidelines for Patients and illustrations herein may not be reproduced in any form for any purpose without the express written permission of NCCN. No one, including doctors or patients, may use the NCCN Guidelines for Patients for any commercial purpose and may not claim, represent, or imply that the NCCN Guidelines for Patients that have been modified in any manner are derived from, based on, related to, or arise out of the NCCN Guidelines for Patients. The NCCN Guidelines are a work in progress that may be redefined as often as new significant data become available. NCCN makes no warranties of any kind whatsoever regarding its content, use, or application and disclaims any responsibility for its application or use in any way.

NCCN Foundation seeks to support the millions of patients and their families affected by a cancer diagnosis by funding and distributing NCCN Guidelines for Patients. NCCN Foundation is also committed to advancing cancer treatment by funding the nation's promising doctors at the center of innovation in cancer research. For more details and the full library of patient and caregiver resources, visit NCCN.org/patients.

National Comprehensive Cancer Network (NCCN) and NCCN Foundation
3025 Chemical Road, Suite 100, Plymouth Meeting, PA 19462 USA

1 About lung cancer screening

5 What is lung cancer screening?

5 Should I get screened for lung cancer?

5 How do you screen for lung cancer?

6 How can I get the best care?

For people at risk of developing lung cancer, regular screening can help find lung cancer at earlier, more treatable stages. This is when lung cancer is most likely to be cured with treatment. This guide provides information on lung cancer risk factors and screening tests to help you make informed decisions with your care team.

What is lung cancer screening?

Lung cancer screening tests for signs of lung cancer on a regular basis. The aim is to find lung cancer at an early stage, before there are any symptoms. This is when treatment will be most successful.

What is lung cancer?

Lung cancer happens when something goes wrong with the natural process of lung cells. It occurs when lung cells develop genetic changes that allow them to multiply and grow out of control. These abnormal cells can replace normal cells in the lung. Lung cancer cells can also spread from the lung to other body parts.

Lung cancer causes more deaths than any other cancer. The high number of deaths is due in part to lung cancer not being found until it's become advanced. Cancer screening can help find lung cancer at an early stage when it is more likely to be cured.

Should I get screened for lung cancer?

The decision to start screening depends on your risk for lung cancer. Experts recommend lung cancer screening only for people at higher risk, so most people don't need it. Read Chapter 2 to learn if you have a higher risk for lung cancer. This chapter also explains other factors to consider when deciding whether to start a lung cancer screening program.

How do you screen for lung cancer?

Screening for lung cancer is done with an imaging test that makes pictures of the inside of your chest. Chapter 3 describes the first scan and what lung cancer looks like in images.

A radiologist will review the images, and a plan will be made for the next steps of testing. Some people get the next screening scan in a year, but others need another scan sooner, depending on what is found. Recommendations for the next steps are explained in Chapters 4 through 6.

If your team suspects that you have lung cancer, the abnormal lung tissue will be removed and tested. Testing tissue for lung cancer is addressed in Chapter 7.

How can I get the best care?

Advocate for yourself. You have an important role to play in your care. Many people feel more satisfied when they actively take part in making decisions about cancer screening.

The NCCN Guidelines for Patients will help you play a larger role in your care. Discuss the recommendations in this guide with your care team. Ask questions about your options and share your goals and concerns.

Don't know what to ask? You're not alone. That's why we include suggested questions to ask at the end of chapters.

Keep reading to find the best care for you.

How this guide can help you

Making decisions about cancer care is stressful. There's a lot to learn, and you don't know what the future holds.

Use this guide to get the information and support you need.

Patients, doctors, and other health care professionals trust the NCCN Guidelines for Patients. This guide uses clear, everyday language to explain current cancer care recommendations made by respected experts in the field. Their recommendations are based on the latest research and practices at leading cancer centers.

Your health is unique to you, so your cancer care should be, too. As you read this guide, you'll learn which treatments are likely to provide the best results for you. And you'll be better prepared to talk with your care team.

2

Deciding to start lung cancer screening

8 Lung cancer risk factors

11 Find out your level of risk

11 Reasons lung cancer screening isn’t recommended

12 Reasons lung cancer screening may be recommended

13 Risks and benefits of lung cancer screening

14 Key points

14 Questions to ask

Some people are more likely than others to develop lung cancer. People at higher risk may benefit from being in a lung cancer screening program. Read on to learn how to decide if lung cancer screening is right for you.

In this chapter, you'll find information about risk factors for lung cancer. You'll also learn how care teams decide who is at higher risk and who is at lower risk for developing lung cancer. The risks and benefits of lung cancer screening will be discussed.

Lung cancer risk factors

Risk is your chance of developing lung cancer. Everyone has some risk for lung cancer. However, some people are at higher risk than others. Things that increase a person's risk for lung cancer can be:

- Related to health and lifestyle.
- In the environment, like in the air we breathe.
- Traits passed down from birth (biological) parents to children through genes. Genes tell cells in your body what to become and what to do.

Your primary care team will assess if you have any known risk factors for lung cancer by asking you about the health topics listed in **Guide 1**.

Guide 1
Topics to assess your lung cancer risk

Cigarette smoking history
Radon exposure
Exposure to asbestos and other cancer-causing agents
Personal cancer history
Past radiation treatment to the chest
Family history of lung cancer in first-degree blood relatives (parents, children, siblings)
History of COPD (chronic obstructive pulmonary disease) or pulmonary fibrosis
Second-hand cigarette smoke exposure

Cigarette smoking

Smoking cigarettes is the biggest risk factor for lung cancer.

People who have never smoked cigarettes are less likely to develop lung cancer than people who have smoked cigarettes.

To assess your risk, your care team will ask about:

- How much you smoked
- How many years you smoked
- How long it's been since you stopped smoking

Keep in mind:

- If you don't smoke, it's important that you don't start now.
- If you do smoke, your care team can offer support and resources to help you smoke less or stop smoking. Your chance of developing lung cancer decreases if you stop smoking.
- If you have smoked in the past and you've quit smoking, your care team can offer support to help keep you from starting again.
- Lung cancer screening is not to be used in place of quitting smoking.

Radon exposure

Radon is radioactive gas found in nature that can cause lung cancer. Radon is given off by soil or rock and can enter buildings and homes. You cannot see or smell radon gas, but tests can detect it.



If you smoke, seek help to quit

Quitting smoking will reduce your risk of developing lung cancer. Learn about the strategies to quit smoking in *NCCN Guidelines for Patients: Quitting Smoking,* available at NCCN.org/patientguidelines.

For online support, try these websites:

- SmokeFree.gov
- CDC.gov/tobacco

People who are exposed to radon don't have symptoms right away. But breathing radon into your lungs over time is very dangerous.

High amounts of radon have been found in homes across the United States. The Environmental Protection Agency (EPA) has maps of Radon Zones and Supporting Documents by State at: epa.gov/radon/epa-maps-radon-zones-and-supporting-documents-state.

Other cancer-causing agents

Besides radon, other agents that may harm the lungs include:

- Arsenic, beryllium, cadmium, chromium, nickel, and uranium
- Asbestos
- Coal smoke, soot, silica, and diesel fumes

Personal history of cancer

You also have an increased risk for developing lung cancer if you have had:

- Lymphoma
- Breast cancer
- Head and neck cancer
- Another tobacco-related cancer (like bladder, kidney, or liver cancer)

Family health information can change. Share with your health care team any changes to your health or family health history.

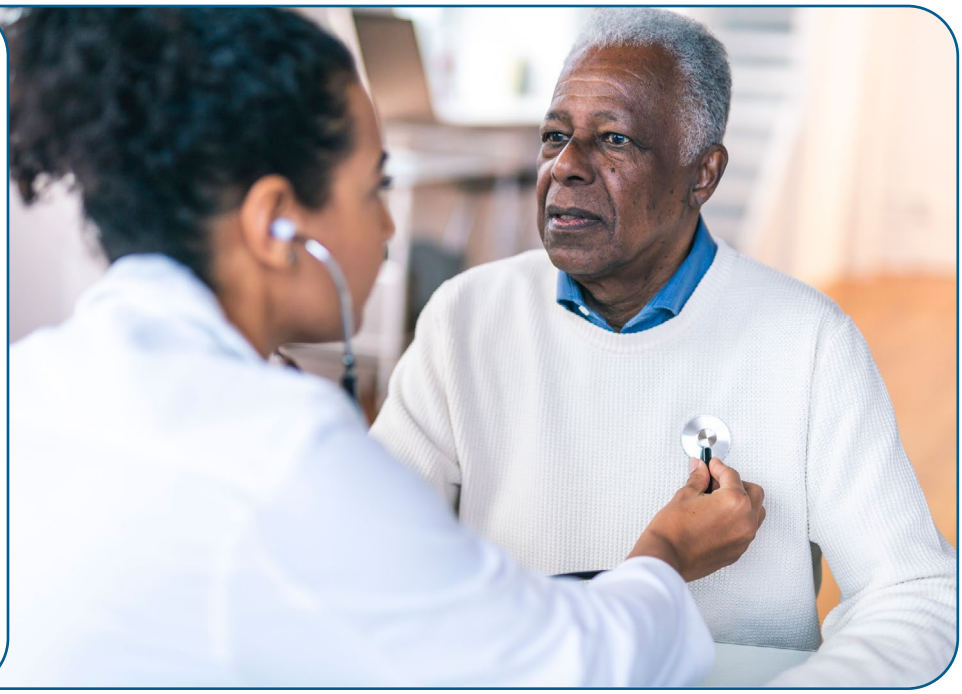
Radiation treatment to the chest

If you've had radiation treatment to the chest in the past, you're at higher risk for developing lung cancer.

Family history of lung cancer

You have a higher risk for lung cancer if a close family (blood) relative has had lung cancer. A close family member includes a parent, sibling, or child.

Lung cancer screening is only for people at higher risk for lung cancer. You and your health care team can decide if screening is right for you.



History of lung disease

A history of either chronic obstructive pulmonary disease (COPD) or pulmonary fibrosis increases your risk for lung cancer. Chronic means continuing for a long time. Chronic damage and inflammation in your lungs increase the risk for lung cancer.

Second-hand cigarette smoke

Second-hand cigarette smoke is smoke that has been exhaled, or breathed out, by a person smoking cigarettes. It's also smoke from the burning tip of cigarettes, cigars, or pipes.

Lung cancer screening isn't recommended for people whose **only** risk factor is contact with second-hand smoke.



Number of packs per day
x years of smoking
= Pack-years

Example:
1.5 packs a day x 30 years =
45 pack-years

Find out your level of risk

Your care team's decision to recommend lung cancer screening is based on a risk review that includes your lung cancer risk factors and overall health, as well as other possible serious health issues.

NCCN recommends lung cancer screening based on risk groups. There are 2 risk status groups: **lower risk** and **higher risk**. These risk groups are explained in the next sections.

The NCCN risk groups are determined by age and smoking history, but the other risk factors described earlier in this chapter may also be discussed with your care team.

Reasons lung cancer screening isn't recommended

You're at lower risk

Lung cancer screening isn't recommended for people at lower risk.

People are considered to have a lower risk if they:

- Are 49 years of age and under
- Have less than a 20 **pack-year** history or less than a 20-year history of smoking cigarettes

A **pack-year** is the number of packs of cigarettes a person smoked every day multiplied by the number of years of smoking.

You have cancer symptoms, lung cancer history, or other health concerns

Other reasons why lung cancer screening is not recommended:

- You have symptoms of lung cancer. Screening is a tool used for early detection **before** lung cancer symptoms exist. **If you have symptoms of lung cancer**, talk to your health care team about next steps.
- You **have had lung cancer** in the past. People who have been treated for lung cancer are monitored for lung cancer recurrence (lung cancer coming back) or new cancer in a different way from people who haven't had lung cancer.
- Your general level of fitness and overall health would make it hard on your body to handle lung cancer treatment.
- You are near the end of life.

Reasons lung cancer screening may be recommended

You're at higher risk

Screening is usually recommended for people at higher risk for lung cancer.

People who smoke cigarettes, or have smoked them in the past, are considered at higher risk if they are 50 years of age or over and have:

- A history of 20 or more **pack-years**
- Or smoked cigarettes for at least 20 years

If you have a history of smoking cigarettes and are age 50 or older, you are likely to have a higher risk for lung cancer.

Other things that can affect the decision to start screening

- Discuss the benefits and risks for lung cancer screening with your care team so you can decide if lung cancer screening is right for you. There are also decision aids to help you consider the pros and cons.
- Your care team may use other risk tools in addition to the NCCN risk groups to decide whether to recommend lung cancer screening.
- Research suggests that screening is appropriate for people up to age 77. But people aged 77 years and over can start (or continue) a screening program if they don't have other health conditions that would make it too hard for them to undergo treatment that aims to cure lung cancer.
- Deciding to start a lung cancer screening program can be distressing. There are many things to think about. Learn about the ways to manage distress in the *NCCN Guidelines for Patients: Distress During Cancer Care*.

Risks and benefits of lung cancer screening

Screening only people at higher risk for developing lung cancer helps to prevent unneeded testing. It's important for you and your health care team to share information, weigh screening risks and benefits, and agree on a plan that works for you and your situation.

Known **risks** of lung cancer screening include:

- Screening tests may pick up unusual areas (abnormalities) that look like cancer but are not cancer. This error is called a **false-positive** result. With a false positive, you might have cancer-related tests, like a biopsy, only to find out you don't have cancer.
- **False-negative** results. This is when screening tests do not detect lung cancer, but you later find out that you do have lung cancer.
- Exposure to radiation
- Anxiety about scan results

Known **benefits** of lung cancer screening include:

- Screening leads to **earlier detection** of lung cancer, which leads to treatment that's more likely to be helpful.
- Sometimes screening can help **diagnose other health conditions**, such as other lung disease, heart disease, or cancers, that haven't caused symptoms. As a result, steps can be taken to treat these conditions.
- Screening can help **reduce** anxiety, if you're at higher risk and are worried about lung cancer.

Key points

- Some people are more likely than others to develop lung cancer.
- Your health care team can assess your risk for developing lung cancer.
- Based on your age and smoking history, you may be at lower risk or higher risk for lung cancer.
- Besides smoking, some lung diseases, certain cancers, and your family health history may increase your risk, too.
- NCCN recommends lung cancer screening for people at higher risk and who would benefit from a lung cancer screening program.
- Risks of lung cancer screening include false-positive results and false-negative results, as well as radiation exposure.
- Benefits of lung cancer screening include earlier detection, when treatment is more likely to be helpful.

Questions to ask

- What is my risk for lung cancer?
- Should I start lung cancer screening?
- Can the risks of screening be reduced?
- How can I get help to quit smoking?
- Can I reduce my risk for developing lung cancer?

What's next?

In the next chapter, you'll learn about imaging scans and other tests that can be part of a lung cancer screening plan. You can also learn what lung nodules are and how they relate to cancer.

3
Getting the first screening scan

16 Screening with LDCT scan

17 Analyzing chest images

19 What are lung nodules?

22 If first LDCT doesn’t suggest lung cancer

23 If first LDCT suggests lung cancer

24 Key points

24 Questions to ask

A low-dose computed tomography (LDCT) scan is recommended for lung cancer screening. LDCT scans help find areas or spots of abnormal tissue in the lungs. Some of these spots are called nodules. Some nodules are caused by lung cancer.

This chapter explains how lung cancer can be detected early with imaging. Lung nodules have different traits. Some traits mean the lung nodules are more likely to be cancer.

Screening with LDCT scan

Low-dose computed tomography (LDCT) is a type of imaging used to help find lung cancer early. Imaging involves pictures taken of the inside of your body. A radiologist, a doctor who interprets images, will write a report and send it to your health care team.

LDCT is recommended as the first test in a lung cancer screening program. The test takes just a few minutes.

Chest x-rays are not recommended for lung cancer screening. An x-ray is a test that uses small amounts of radiation to make pictures of the insides of the body. X-rays are not recommended because they:

- Don't provide as much detail as a CT scan.
- Don't reliably detect early lung cancer.

To understand LDCT, it's helpful to first know what a standard-dose CT scan is and how this imaging test works. An LDCT scan is almost the same as a standard-dose CT.

The main difference is that the amount of radiation used is much lower for LDCT than standard-dose CT.

CT scanner machine

A CT scanner machine is large and has a tunnel in the middle. During the test, you lie on your back on the table that moves slowly through the tunnel.



CT scan

Standard-dose CT is often simply called a CT scan. It's sometimes called a diagnostic CT scan.

A computed tomography (CT or CAT) scan uses x-rays and computer technology to take pictures of the inside of the body. The CT scanner takes many x-rays of the same body part from different angles. The amount of radiation used is more than for plain x-rays but still is small. All of the images are combined to make a series of cross-sectional images of your chest.

Standard-dose **chest CT** scans **may** be part of a lung cancer screening program if the LDCT scan is abnormal.

Contrast material given through a vein in your arm is sometimes used with standard-dose CT to improve the pictures of the inside of the body. These materials are substances that help enhance the images of organs and structures in the body. Contrast is used to help tell if the structures are normal or abnormal. This material leaves the body in your urine after the test.

Analyzing chest images

A radiologist will review the images of your chest. These images help doctors check the health of your lungs and airways.

What are the lungs?

The lungs are a pair of organs located in the chest. They are the main organs of the lower respiratory tract, which is part of the respiratory system.

The respiratory system helps us get the oxygen we need into our bodies and get rid of carbon dioxide:

- When we breathe in (inhaling), air goes into the airways where it is filtered by the lungs and oxygen goes into the bloodstream.
- When we breathe out (exhaling), carbon dioxide is released and goes out through the airways.

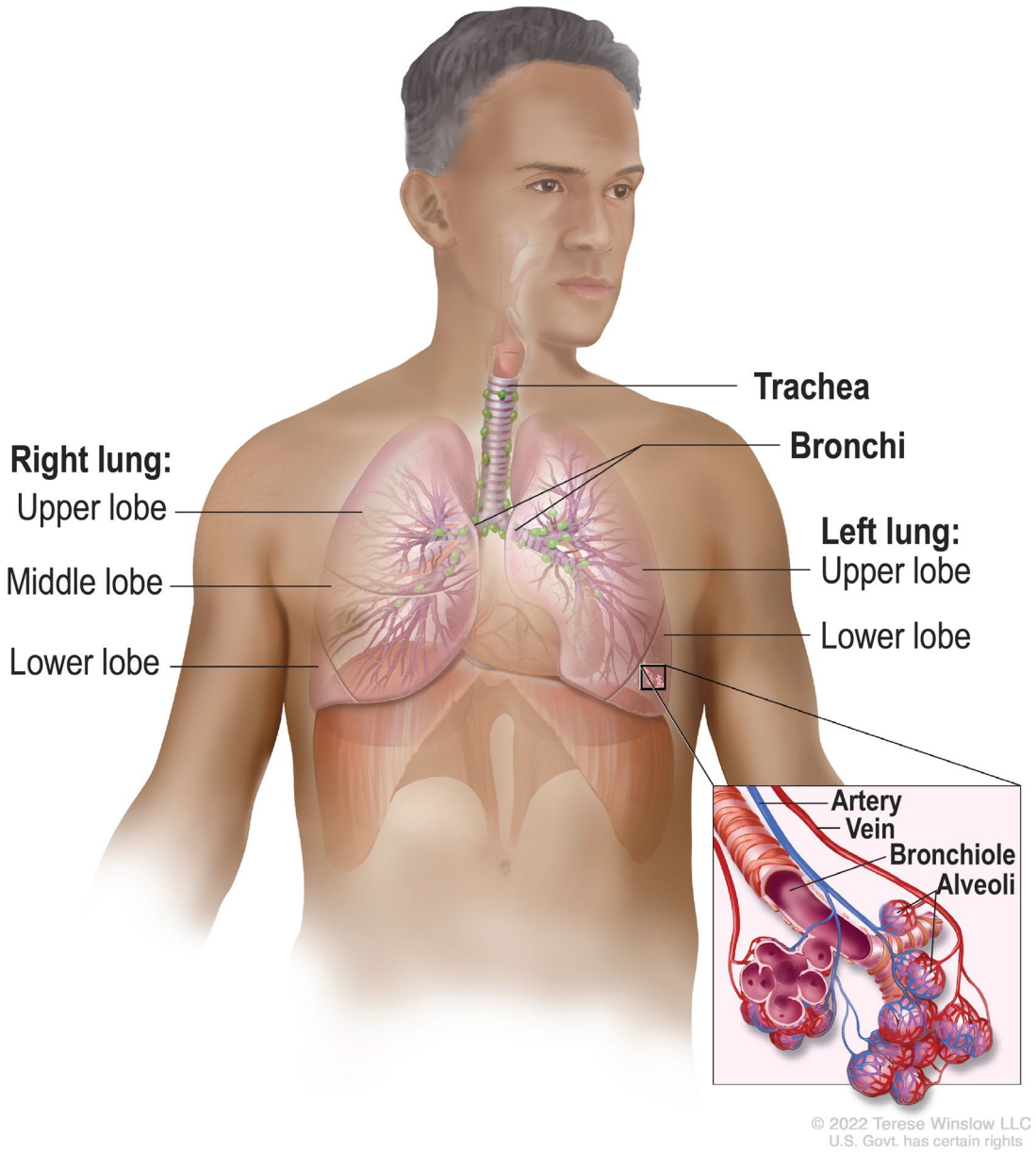
The lower respiratory tract includes the airways and the lungs:

- **The trachea** is also known as the windpipe.
- **Bronchi** are 2 large breathing tubes. There is 1 main bronchus for each lung. The bronchi connect the trachea to the lungs.
- **Bronchioles** are small tubes leading from the main bronchi inside the lungs.
- **Alveoli** are small air sacs at the end of the bronchioles. From here, oxygen is transferred into your blood.

The picture on the next page shows the airways and the lungs.

Lungs and airways

Your lungs are the main part of the lower respiratory tract.



What are lung nodules?

Lung (pulmonary) nodules are small areas of abnormal tissue that appear more solid than normal lung tissue. A nodule can grow to 30 millimeters (mm) in thickness. If an area of abnormal tissue is larger than 30 mm, it's called a mass.

A lung nodule:

- Can be caused by many things. Some are explained in the next section.
- May be a sign of cancer.

Here is some more information about lung nodules:

- The radiologist will look for lung nodules on the LDCT image. One or more lung nodules may be found.
- The type of nodule or nodules that may be seen on the LDCT images, based on their traits, helps to determine the next step or steps in your screening plan. These traits are explained in the following sections.
- If **no** lung nodules are seen, your care team will conclude that you **do not** have lung cancer at this time. For next steps, see **Guide 3**.

Not all lung nodules are caused by cancer

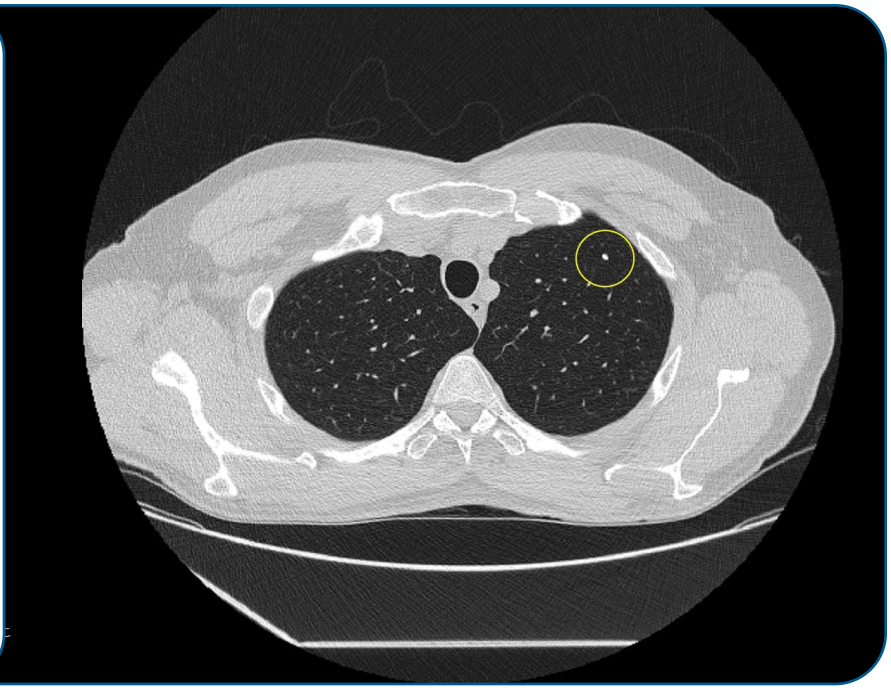
It's important to know that many lung nodules are not caused by lung cancer. Some nodules are caused by:

- Calcium or fat (which looks different from cancer on an LDCT scan)
- Infection or inflammation (current or that happened in the past)
- Other conditions or diseases

Lung nodule

A lung nodule (circled in image) is a small area of abnormal tissue in the lung. Many people have lung nodules. Most are not cancer. When nodules are found by imaging, you may receive more scans to assess if the nodule is cancer.

This work is licensed under a Creative Commons Attribution-ShareAlike 3.0 Unported License. https://commons.wikimedia.org/wiki/File:CT-Low-Dose-1.25-Lung-Calcified-Nodule.jpg



Decisions about next steps in screening programs are based, in part, on whether a nodule looks like one of these other things listed above. What to do when one of these other types of lung nodules is found is explained later in this chapter, in *If first LDCT doesn't suggest lung cancer*.

A nodule that grows very quickly from one scan to the next is likely to be inflammation or infection. Or it may be a cancer other than lung cancer. Nodules that grow more slowly **may** be a cancer.

Lung nodule traits and cancer

Nodules caused by cancer may have specific traits. They may:

- Have rough edges and bumpy or spiky (not smooth) shapes.
- Grow faster and be larger than nodules that are not cancer.

If a lung nodule is new or has changed in size, shape, density, or how it looks, further testing may be recommended.

Nodule size, density, and changes

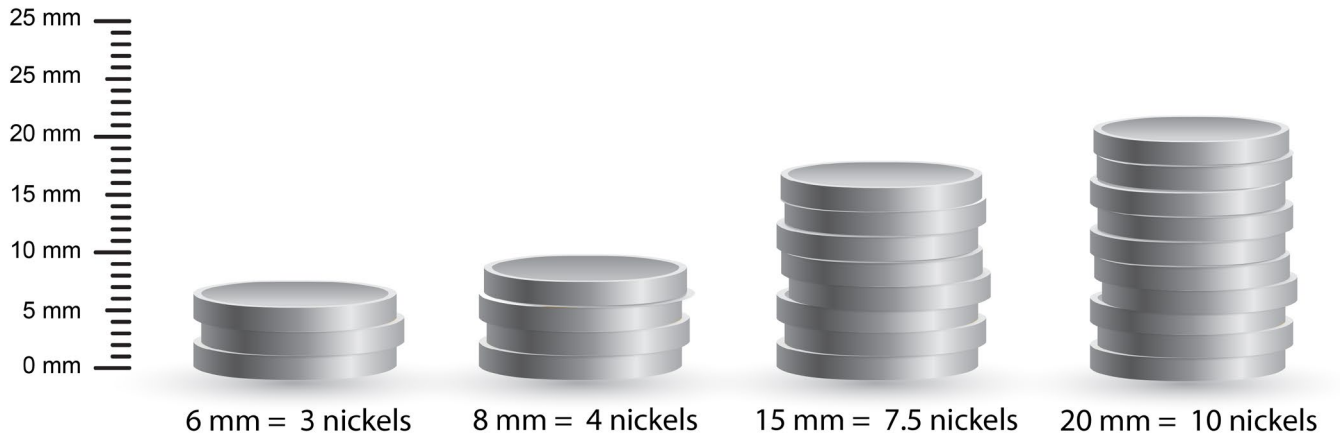
Decisions about next steps are made, in part, based on:

- The nodule's size and density
- If the nodule stays the same or increases in size over time, and how fast it grows

Size of nodules is measured in mm (millimeters), rounded to the nearest whole number. Many of the nodules found on LDCT images are small.

Density is how solid a nodule is. Density is measured by how solid versus hazy a nodule looks on the LDCT pictures. A solid nodule has a higher density than a hazy one.

How big is 6 mm, 8 mm, 15 mm, and 20 mm?



Lung nodules are divided into 3 groups based on density. They may be described as solid, nonsolid, or part-solid. For more information about these 3 types of nodules, see **Guide 2**.

Changes in size, density, or how the nodule looks on the LDCT image may mean you'll have tests more often to track these changes.

If you have any questions about a nodule that was found on your LDCT image or the chance that the nodule might be cancer, talk to your health care team.

It's important to know the next steps in your lung cancer screening plan.

Guide 2
Nodule density

 **Solid nodules**	Solid nodules are highly dense.
 **Nonsolid nodules**	• Nonsolid nodules have low density. • They look fuzzy or hazy on imaging. • They are sometimes called "ground-glass" nodules because of their hazy appearance.
 **Part-solid nodules**	Part-solid nodules have both solid (highly dense) and nonsolid (low density) areas.

If first LDCT doesn't suggest lung cancer

The initial, or first, LDCT scan may show no lung nodules. Or it may show nodules that look benign (not caused by lung cancer) or are very unlikely to be cancer. NCCN screening recommendations based on these findings are described in **Guide 3**.

Benign nodules may contain calcium or fat on an LDCT.

Screening plan when no nodules or signs of lung cancer

Annual LDCT screening is recommended if you have no lung nodules, or a nodule that appears benign, or certain other abnormal findings that are not likely to be infection or inflammation.

LDCT will be performed once every 12 months as long as:

- There are no signs of lung cancer
- Your body's level of fitness and your overall health is such that you could handle treatment aimed at curing cancer, if lung cancer is found.

Timing of the annual scan may be reset if you have a standard-dose CT done for another reason between your annual screening LDCTs.

Screening plan when nodules likely caused by infection or inflammation

If you may have an infection or inflammation in your lungs, NCCN experts recommend a follow-up LDCT scan in 1 to 3 months. After that scan, recommendations for the next scan are:

- If the nodule is gone, start annual screening.
- If the nodule is getting smaller, get another follow-up LDCT scan in 3 to 6 months.
- If the nodule is the same or getting larger, see follow-up screening recommendations listed in the next chapters.

Guide 3
Next steps when lung cancer is not suspected based on first LDCT

LDCT is recommended in 12 months	• If no lung nodules are found. • If nodules are benign or very unlikely to be lung cancer.
LDCT is recommended in 1 to 3 months	If a nodule is suspected to be caused by something else, like infection or inflammation.

If first LDCT suggests lung cancer

The initial, or first, LDCT may show a lung nodule that appears to be lung cancer.

There are 3 ways these nodules can be managed, depending on nodule traits explained earlier in this chapter. You may:

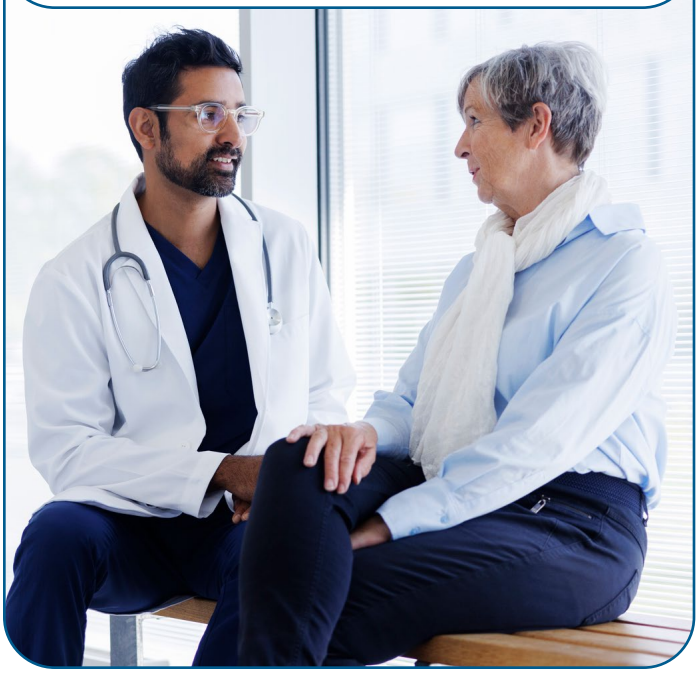
- Continue with LDCT scans based on recommendations that will be explained later in this guide.
- Have a different type of scan to learn more about the abnormal finding on the LDCT:
  - Standard-dose **chest CT** with contrast makes a clearer image of the nodule than LDCT. It may also show areas of concern on lymph nodes.
  - **FDG-PET/CT. PET/CT** imaging is positron emission tomography (PET) combined with computed tomography (CT). Fluorodeoxyglucose (FDG) is a radioactive tracer that's injected into a vein before the PET scan and collects mainly in certain cells, like cancer cells. The tracer makes cancer cells appear brighter on the images. FDG-PET/CT can detect cancer (and other abnormalities) in other parts of the body, but may not be helpful for a nodule that has a solid part smaller than 8 mm.
- Have a **biopsy** that removes cells from abnormal tissue for testing. Testing tissue is the only way to confirm if there's cancer. Biopsies are further explained in *Chapter 7: Testing for lung cancer*.

Lung cancer screening care team

NCCN recommends a multidisciplinary team for managing lung nodules. These doctors are trained in different areas related to your health care. They will put a care plan into action. Your team will include:

- **A thoracic (chest) radiologist**, an expert in interpreting test images for lung diseases
- **A pulmonologist**, an expert in lung diseases
- **A thoracic surgeon**, an expert in chest operations

The timing of follow-up LDCTs is based on your risk factors for lung cancer and results of your previous LDCTs.



Your team may also include:

- **A pathologist**, an expert in tissue and cells and confirming cancer
- **Oncologists**, who treat cancer
- **An interventional radiologist**, who interprets imaging tests and uses image-guided tools to perform techniques to diagnose or treat cancer and other conditions

Your lung cancer screening care team can:

- Decide that a lung nodule may be cancer based on your risk factors and how the nodule looks on imaging tests.
- Schedule the next screening or follow-up test based on the nodule as detailed in Chapters 4 through 6.
- Plan the best way to confirm a nodule is lung cancer as described in *Chapter 7: Testing for lung cancer*.

Key points

- Screening for lung cancer starts with a low-dose computed tomography (LDCT) scan.
- Lung nodules are small areas of abnormal lung tissue, some of which are caused by cancer.
- Annual screening with LDCT is recommended if no nodules or no signs of lung cancer are found on the first scan.
- Follow-up LDCT is recommended when a nodule appears to be caused by infection or inflammation.
- A multidisciplinary team for lung cancer screening includes radiology, pulmonology, and other specialties.

Questions to ask

- How can I get the results of my first LDCT?
- Were nodules found in my lungs?
- What are the next steps for my screening plan?
- Will you help me schedule my next scan and send a reminder?

What's next?

If a solid lung nodule is found on your first or follow-up LDCT scan, you can read about your next steps in the next chapter. For information on managing nonsolid nodules, go to *Chapter 5: Next steps of care for a nonsolid nodule*. If a part-solid nodule is found, you can learn more in *Chapter 6: Next steps of care for a part-solid lung nodule*.

4

Next steps of care for a solid lung nodule

26 Solid lung nodule on first LDCT

28 Solid nodule on later LDCT

30 Key points

30 Questions to ask

This chapter describes NCCN's recommendations for lung cancer screening if a solid lung nodule is found on your first low-dose computed tomography (LDCT) scan or on a follow-up LDCT scan.

Solid lung nodule on first LDCT

If a solid lung nodule is found on your first low-dose computed tomography (LDCT), the next steps depend on the size of the nodule.

Nodules in the lungs are most common. Nodules in the bronchi (the main airways into the lungs) are much less common and are managed differently from nodules in other airways.

Screening recommendations for solid nodules found on first LCDT are summarized in **Guide 4**.

Usually, smaller lung nodules that are not in a bronchus are watched with repeated LDCT scans. Larger nodules may be scanned with clearer imaging or biopsied.

Guide 4
Solid nodule: Recommendations based on first LDCT

If the nodule is smaller than 6 mm	You'll have LDCT scans annually.
If the nodule is 6 mm up to 8 mm	Your next LDCT will be in 6 months.
If the nodule is 8 mm up to 15 mm	You may have one of the following: • LDCT scan in 3 months • FDG-PET/CT scan now
If the nodule is 15 mm or larger	You may have one or more of the following now: • Chest CT with contrast • FDG-PET/CT scan • Biopsy
If there's an endobronchial nodule	You'll have another LDCT in 1 month or less. If the nodule is still present, a biopsy is recommended.

Smaller nodules

Annual screening is recommended if the nodule is smaller than 6 mm.

- LDCT will be scheduled for 12 months following the first scan and every 12 months thereafter unless the nodule changes or screening is no longer helpful.
- The timing of the annual scan may be reset if you have a standard-dose CT.

If the nodule is 6 mm up to 8 mm, you'll have a follow-up LDCT in 6 months. These larger nodules need to be watched more closely than nodules smaller than 6 mm.

The next steps after annual and follow-up LDCT are explained later in this chapter.

Larger nodules

After the first LDCT, nodules between 8 mm and 15 mm may be screened again in 3 months with LDCT. A second option is to have a fluorodeoxyglucose (FDG)-PET/CT scan now instead of waiting.

PET/CT imaging is positron emission tomography (PET) combined with computed tomography (CT). A radioactive tracer (FDG), is injected into the blood before the PET scan and collects mainly in cancer cells. The tracer makes cancer cells appear brighter on the images. FDG-PET/CT can detect cancer, even small amounts, and provides an image of most of the body, but may not be helpful for a nodule that has a solid part smaller than 8 mm.

The next step for nodules 15 mm or larger is to have standard-dose chest CT with contrast, FDG-PET/CT, a biopsy, or a combination of these procedures.

After chest CT or FDG-PET/CT, screening with LDCT will resume in 3 months if your team doesn't highly suspect you have lung cancer. If your team does highly suspect you have lung cancer, tissue will be removed from your lung and tested.

Learn more about how tissue is removed to test for cancer in *Chapter 7: Testing for lung cancer*.

Solid nodule in a bronchus on first LDCT

A solid endobronchial nodule means the solid nodule is inside 1 of the 2 bronchi. If this is the case, you'll have another LDCT in 1 month or less:

- The 1-month follow-up LDCT is used to show if the growth seen on the first LDCT is just phlegm or an actual nodule.
- Phlegm is thick mucus that builds up in the lungs and makes you cough. Just before your LDCT, the technician will ask you to cough forcefully to help remove phlegm.
- If the nodule hasn't gone away at the follow-up screening, you'll have a biopsy. To learn more about biopsy, see *Chapter 7: Testing for lung cancer*.

Solid nodule on later LDCT

Your care team will compare the results of all of your tests to decide what will come next in your screening plan. Recommendations are based on whether there is a new nodule or if the nodule found on the first LDCT scan has changed.

The screening schedule for previously found solid nodules on follow-up or annual LCDT is shown in **Guide 5**.

Previously found nodule

- If the nodule hasn't changed, you'll likely get another LDCT scan in 12 months if the nodule is up to 8 mm, or in 6 months if the nodule is 8 mm up to 15 mm. For a nodule that's 15 mm or larger, your next LDCT scan will be in 6 months or you'll have a PET/CT now.
- If the nodule has grown and is smaller than 8 mm, you'll have an LDCT in 3 months. Once a nodule is 8 mm or larger, you'll have other tests, such as a chest CT with contrast or FDG-PET/CT, to look for cancer.

After chest CT or FDG-PET/CT, screening with LDCT will resume in 3 months, unless your team highly suspects you have lung cancer. If your team does highly suspect you have lung cancer, tissue will be removed from your lung and tested.

Learn more about how tissue is removed for cancer testing in *Chapter 7: Testing for lung cancer*.

Guide 5
Solid nodule: Recommendations based on follow-up or annual LDCT

If there's no change to existing nodule on follow-up or annual LDCT	If the nodule is smaller than 8 mm, you'll have LDCT scans annually. If the nodule is 8 mm up to 15 mm, your next LDCT will be in 6 months. Then, if it's unchanged, you'll have LDCT scans annually. If the nodule is 15 mm or larger, you'll have one of the following: • LDCT scan in 6 months • FDG-PET/CT scan now
If the existing nodule has grown more than 1.5 mm	If the nodule is smaller than 8 mm, your next LDCT will be in 3 months. If the nodule is 8 mm or larger, you'll have one or both of the following: • Chest CT with contrast • FDG-PET/CT scan

New nodule

Screening for a new solid nodule found on follow-up or annual LDCT is shown in **Guide 6**.

If a new solid nodule is found on a follow-up or annual LDCT, you'll likely get another LDCT scan. A larger nodule is checked sooner than a smaller nodule. Your next scan will be in:

- 12 months if the nodule is smaller than 4 mm.
- 6 months if the nodule is 4 mm up to 6 mm.
- 3 months if the nodule is 6 mm up to 8 mm.

For a nodule 8 mm or larger, other tests, such as chest CT or FDG-PET/CT scans, are used to look for cancer. If testing for cancer is needed after these scans, learn about how tissue is removed for testing in *Chapter 7: Testing for lung cancer*.

Guide 6
Solid nodule: Recommendations if new nodule on follow-up or annual LDCT

If the nodule is smaller than 4 mm	You'll have LDCT scans annually.
If the nodule is 4 mm up to 6 mm	Your next LDCT will be in 6 months.
If the nodule is 6 mm up to 8 mm	Your next LDCT will be in 3 months.
If the nodule is 8 mm or larger	You'll have one or both of the following: • Chest CT with contrast • PET/CT scan

Key points

- The next steps after a solid lung nodule is found during your first low-dose computed tomography (LDCT) scan depend on the nodule size and if it's located in a bronchus or other airway.
- If not located in a bronchus, smaller nodules are typically reassessed with another LDCT. Larger nodules are often assessed with chest CT, FDG-PET/CT scan, or biopsy.
- A nodule inside the bronchus is checked within a month to assess if it's just phlegm or if it is an actual nodule.
- After the follow-up or annual LDCT, what happens next is based on whether there's a new nodule or if the previously found nodule has changed. Follow-up care may include another LDCT, CT, or FDG-PET/CT scan. When cancer is suspected, a biopsy is needed.

Questions to ask

- What are the results of my scans?
- What are the next steps in my screening plan?
- Will you help me schedule my next appointment and send a reminder?
- Will insurance pay for my scans?
- What can I do if I need help with transportation?

What's next?

It's common to have more questions about lung cancer screening. To find out where to get your questions answered, go to *Chapter 8: Other resources*.

5

Next steps of care for a nonsolid lung nodule

32 Nonsolid lung nodule on first LDCT

33 Nonsolid nodule on later LDCT

34 Key points

34 Questions to ask

This chapter explains the recommendations for lung cancer screening if a nonsolid lung nodule is found on your first low-dose computed tomography (LDCT) scan or on a follow-up or annual LDCT scan.

Nonsolid lung nodule on first LDCT

Nonsolid nodules generally require less frequent follow-up than solid nodules. Annual screening is recommended if the nodule is smaller than 20 mm. You'll continue to have screening every year until it's no longer helpful or the nodule changes.

The timing of the annual scan may be reset if you have a standard-dose CT.

If the nodule is 20 mm or larger, you'll have a follow-up low-dose computed tomography (LDCT) in 6 months. These nodules need to be watched more closely than smaller ones.

You can learn what to expect if a nonsolid nodule is found on your first LDCT in **Guide 7**.

The next steps after annual and follow-up LDCT are explained next.

Guide 7
Nonsolid nodule: Recommendations based on first LDCT

If the nodule is smaller than 20 mm	You'll have LDCT scans annually.
If the nodule is 20 mm or larger	You'll have your next LDCT in 6 months.

Nonsolid nodule on later LDCT

Your care team will compare the results of all of your tests to decide what will come next in your screening plan. Recommendations are based on whether the nodule is new or was found on a prior scan. Recommendations are summarized in **Guide 8**.

Previously found nodule

If the nodule hasn't grown, you'll have LDCT scans every year (annually).

If a growing nodule is smaller than 20 mm, your next LDCT will be in 6 months. If the nodule is 20 mm or larger, you and your care team will decide whether it's best to have an LDCT in 6 months or have tissue removed for cancer testing. To learn more about cancer testing, read *Chapter 7: Testing for lung cancer*.

New nodule

If there is a new nonsolid nodule that is smaller than 20 mm, your next LDCT will be in 12 months if it is smaller than 20 mm. If the new nodule is 20 mm or larger, the next LDCT will be in 6 months. If the nodule hasn't changed at 6 months, you'll have LDCT scans every 12 months.

If the new nodule is fully solid, see *Chapter 4: Next steps of care for a solid nodule.* If there's a new nodule with a solid part, see *Chapter 6: Next steps of care for a part-solid nodule*.

Guide 8
Nonsolid nodule: Recommendations based on follow-up or annual LDCT

If the existing nodule is not growing	You'll have LDCT scans annually.
If the existing nodule has grown more than 1.5 mm	If the nodule is smaller than 20 mm, you'll have your next LDCT in 6 months. If 20 mm or larger, you'll have one of the following: • Your next LDCT will be in 6 months • Your care team may decide it's better to get a biopsy • Surgical excision
If a new nodule is found	If the nodule is smaller than 20 mm, you'll have LDCT scans annually. If the nodule is 20 mm or larger, the next LDCT will be in 6 months.

Key points

- The screening plan for a nonsolid nodule is based on whether the nodule is smaller than 20 mm or is 20 mm or more.
- For smaller nodules found on initial low-dose computed tomography (LDCT), annual screening is started. If a larger nodule is found, the LDCT is repeated sooner to check for signs of cancer.
- On follow-up or annual LDCT, the next steps for a nonsolid nodule are based on whether there's a new nodule or whether the previously found nodule has stayed the same or grown.
- At follow-up, most people have another LDCT. People with large growing nodules may have another LDCT or be tested for cancer.

Questions to ask

- What are the results of my scans?
- What are the next steps in my screening plan if the nodules stay the same or have changed?
- Will you help me schedule my next appointment and send a reminder?
- Will insurance pay for my scans?
- What can I do if I need help with transportation?

What's next?

It's common to have more questions about lung cancer screening. To find out where to get your questions answered, go to *Chapter 8: Other resources*.

6

Next steps of care for a part-solid lung nodule

36 Part-solid lung nodule on first LDCT

37 Part-solid nodule on later LDCT

39 Key points

39 Questions to ask

In this chapter, you'll learn about next steps in a lung cancer screening plan if a part-solid lung nodule is found on your first or follow-up low-dose computed tomography (LDCT) scan. A part-solid nodule contains an area or areas that are more solid than the rest of the nodule.

Part-solid lung nodule on first LDCT

If a part-solid nodule is found on your first low-dose computed tomography (LDCT), what's done next is based on both the size of the:

- Whole nodule
- Solid part of the nodule

If there are multiple part-solid nodules, care is based on the largest nodule.

You can learn what to expect if a part-solid nodule is found on your first LDCT in **Guide 9**.

Nodules with small solid parts

Annual screening is recommended if the nodule is smaller than 6 mm.

- LDCT will be scheduled 12 months following the first scan and every 12 months thereafter unless the nodule changes or screening is no longer helpful.
- Timing of the annual scan may be reset if you have standard-dose CT.

Guide 9
Part-solid nodule: Recommendations based on first LDCT

If the nodule is smaller than 6 mm	You'll have LDCT scans annually.
If the nodule is 6 mm or larger with a solid part up to 6 mm	Your next LDCT will be in 6 months.
If the nodule is 6 mm or larger and has a solid part 6 mm up to 8 mm	You may have one of the following: • LDCT scan in 3 months • FDG-PET/CT scan now
If the solid part of the nodule is 8 mm or larger	You may have one or more of the following now: • Chest CT with contrast • FDG-PET/CT scan

If the nodule is 6 mm or larger with a solid part smaller than 6 mm, you'll have a follow-up LDCT in 6 months. These nodules need to be watched more closely than nodules smaller than 6 mm.

The next steps after annual and follow-up LDCT are explained later in this chapter.

Nodules with large solid parts

After the first LDCT, nodules 6 mm or larger with a solid part of 6 mm up to 8 mm may be screened again in 3 months with LDCT. A second option is to have fluorodeoxyglucose (FDG)-PET/CT now instead of waiting.

PET/CT imaging is positron emission tomography (PET) combined with computed tomography (CT). A radioactive tracer, FDG, is injected into the blood before the PET scan and collects in certain cells (like cancer cells). The tracer makes cancer cells appear brighter on the images. FDG-PET/CT can detect cancer, even small amounts, and provides an image of most of the body, but may not be helpful for a nodule that has a solid part smaller than 8 mm.

The next step for nodules that have a solid part that's 8 mm or larger is to have standard-dose chest CT with contrast, FDG-PET/CT, or both.

After chest CT or FDG-PET/CT, screening with LDCT will resume in 3 months, unless your team highly suspects you have lung cancer. If your team does highly suspect you have lung cancer, tissue will be removed from your lung and tested.

Learn more about how tissue is removed for cancer testing in *Chapter 7: Testing for lung cancer*.

Part-solid nodule on later LDCT

Your care team will compare the results of all of your tests to decide what will come next in your screening plan. Recommendations are based on whether there are any new nodules found or if the nodules found on your first or previous LDCT have changed.

If a new part-solid nodule that measures at least 4 mm up to 6 mm is found on your follow-up or annual LDCT, you'll get another LDCT scan in 6 months.

Screening recommendations for existing part-solid nodules based on follow-up or annual LDCT are summarized in **Guide 10**.

Nodule hasn't changed

If the nodule found on your first LDCT hasn't changed, the next steps are based on the size of the nodule and the size of the solid part. Your next test will be an LDCT in 12 months if the nodule is:

- Smaller than 6 mm
- 6 mm or larger with a solid part up to 6 mm

If the nodule is 6 mm or larger and has a solid part between 6 and up to 8 mm, you may have an LDCT in 6 months. If the nodule is unchanged at that 6-month scan, you'll continue with annual screening. A second option for larger nodules with solid components of 6 mm up to 8 mm is to have an FDG-PET/CT scan now.

After FDG-PET/CT, screening with LDCT will resume in 6 months, unless your team highly suspects you have lung cancer. If your team does highly suspect you have lung cancer, tissue will be removed from your lung and tested.

Learn more about how tissue is removed for cancer testing in *Chapter 7: Testing for lung cancer*.

Nodule has grown

If the nodule found on the first LDCT has grown or has a new solid part, next steps are based on the size of the nodule and the size of the solid part:

- If the solid part is smaller than 4 mm, your next follow-up LDCT will be in 3 months.
- If the solid part is 4 mm or larger, you'll have a CT scan, an FDG-PET/CT scan, or both.

Guide 10
Part-solid nodule: Recommendations based on follow-up or annual LDCT

If the nodule hasn't changed and is small or has a small solid part	You'll have LDCT scans annually if the nodule is either: • Smaller than 6 mm • 6 mm or larger with a solid part smaller than 6 mm
If the nodule hasn't changed and is 6 mm or larger and has a solid part 6 mm up to 8 mm	You may have one of the following: • LDCT scan in 6 months • FDG-PET/CT scan now
If the solid part of the nodule has grown more than 1.5 mm	If the nodule is 6 mm or larger and the solid part is smaller than 4 mm, your next LDCT will be in 3 months. If the solid part of the nodule is 4 mm or larger, you'll have one or both of the following now: • Chest CT with contrast • FDG-PET/CT scan

After chest CT, FDG-PET/CT, or both, screening with LDCT will resume in 3 months, unless your team highly suspects you have lung cancer. If your team does highly suspect you have lung cancer, samples of the nodule will be removed from your lung and tested.

Learn more about how tissue is removed for cancer testing in *Chapter 7: Testing for lung cancer*.

Key points

- Part-solid nodules contain an area or areas that are more solid than the rest of the nodule.
- The next steps after a part-solid lung nodule is found during your first low-dose computed tomography (LDCT) are based on both the size of the whole nodule and the size of the solid part.
- Nodules with smaller solid parts are typically reassessed with LDCT. Nodules with larger solid parts are often assessed with chest CT, FDG-PET/CT scan, or biopsy.
- On follow-up or annual LDCT, next steps are based on if the nodule has changed, if there's a new nodule, or if the nodule has grown.
- When cancer is suspected, a biopsy is needed.

Questions to ask

- What are the results of my scans?
- What are the next steps in my screening plan?
- Will you help me schedule my next appointment and send a reminder?
- Will insurance pay for my scans?
- What can I do if I need help with transportation?

What's next?

It's common to have more questions about lung cancer screening. To find out where to get your questions answered, go to *Chapter 8: Other resources*.

7
Testing for lung cancer

41 Planning cancer testing

41 Timing of cancer testing

41 Cancer testing on the day of surgery

42 Types of biopsies

43 Results of cancer testing

44 Key points

44 Questions to ask

In this chapter, you'll learn about testing for lung cancer. There are several ways to remove lung tissue for testing, and the best time to test differs among people.

Planning cancer testing

When your multidisciplinary team suspects a lung nodule is cancer, samples will need to be removed and tested. The main procedures used are needle biopsy and surgical biopsy. These will be explained later in the next sections. Your team will make a plan for removing samples for testing based on:

- How difficult a procedure would be
- How safe a procedure is for you
- The best type of procedure
- The best time to test for cancer

Timing of cancer testing

The timing of cancer testing depends on the possible type of cancer treatment and other factors. Your team knows your treatment options, and you'll make a decision about how to get a sample and plan for treatment, if needed, with your care team. The **main treatment** for early lung cancer is either:

- Surgery that removes part of the lung or the whole lung, or
- Stereotactic ablative radiotherapy, which uses radiation to kill cancer cells

If you're having stereotactic ablative radiotherapy, the testing is usually done before treatment starts.

If you're having surgery, cancer testing sometimes occurs during the surgery. But in some cases, a sample is needed before the day of surgery because:

- The nodule is in the center of the chest
- Your team strongly suspects a disease other than lung cancer
- Testing on the day of surgery would be hard to do or unsafe

Cancer testing on the day of surgery

On the day of surgery, the first step in testing for cancer will either be a biopsy or surgical excision. Your surgeon will discuss this with you before the day of surgery. Surgical excision removes the entire nodule, whereas a needle biopsy removes tissue samples of the nodule.

- Your team will decide which type of biopsy (described in the next section) is needed before the day of surgery. If cancer is found, surgery to remove all of the cancer will be started.
- A common excisional method is a wedge resection. A wedge resection removes a small part of a lung that includes the entire nodule. If cancer is found on the sample taken, more of the lung may be removed.

Types of biopsies

Your team will decide what type of biopsy is needed. These decisions are partially based on:

- The location of the nodule
- The type of cancer treatment you'll have
- Removing enough tissue to perform several types of tests

External needle biopsy

Some biopsies are performed with a needle inserted through the skin and into the nodule. Fine-needle aspiration removes cells from the nodule with a very thin needle. A core biopsy is done using a slightly larger needle that removes larger samples or clusters of cells with a hollow needle.

Biopsy during bronchoscopy

A bronchoscopy is a procedure that allows your team to see inside of your airways. It's sometimes used to biopsy lung nodules in the center of the chest, such as endobronchial nodules.

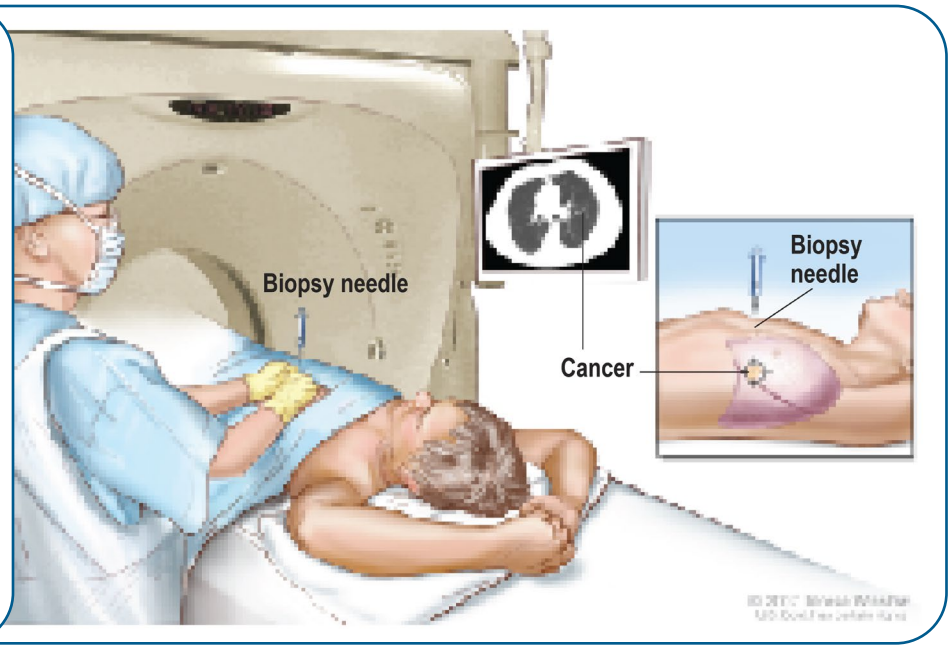
During a bronchoscopy, a long, thin device will be guided down your throat and into your airways. At the tip of the device is a tiny light and camera. Your team will view images from the camera on a screen. The device also has special tools to remove tissue samples.

Surgical biopsy

Surgical biopsies involve making one or more openings into your chest to remove tissue. With minimally invasive methods, your surgeon will insert devices through several small cuts to see the nodule and remove samples. Open surgery involves removing tissue through a single large cut, but it's rarely needed for a biopsy.

Fine-needle aspiration

A sample of a lung nodule is removed with a needle.



Results of cancer testing

After the procedure, a pathologist will examine the removed tissue under a microscope to determine if it's not cancer (benign) or it is cancer (malignant). Your biopsy results can be found in a pathology report.

No cancer is found

If no cancer is found in the sample or surgical tissue, then low-dose computed tomography (LDCT) screening is recommended annually.

- The LDCT will be scheduled 12 months following the last scan and every 12 months thereafter as long as there are no signs of lung cancer and screening is helpful.
- The timing of the annual scan may be reset if you have a standard-dose CT.

Cancer is found

If cancer cells are found in the biopsy sample, your health care team will discuss treatments with you.

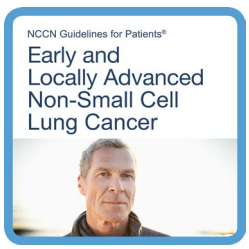
You can read which treatment options NCCN experts recommend in *NCCN Guidelines for Patients: Early and Locally Advanced Non-Small Cell Lung Cancer* and *NCCN Guidelines for Patients: Small Cell Lung Cancer*, available at NCCN.org/patientguidelines and on the NCCN Patient Guides for Cancer app.

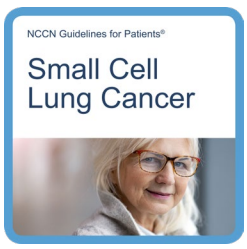
If biopsy test results are unclear

Sometimes a sample of tissue from the biopsy doesn't have enough cells to check for cancer. Or abnormal cells are found that may not be cancer. If this happens, and your care team suspects the nodule biopsied is cancer, you may have one of the following:

- Another biopsy
- Surgical excision
- An LDCT in 3 months

More information on lung cancer is available at NCCN.org/patientguidelines and on the NCCN Patient Guides for Cancer app.





Key points

- Your care team will plan which type of biopsy (test for lung cancer) is best for you based on your needs.
- If your team strongly suspects lung cancer, and you're having surgery, samples of the nodule or the whole nodule will be removed during the surgery and tested.
- A pathologist examines the samples under a microscope to determine if the tissue doesn't have cancer (benign) or does have cancer (malignant).
- When no cancer is found in the lung nodule, annual low-density computed tomography (LDCT) screening is recommended.
- If cancer cells are found in the biopsy sample, your health care team will discuss treatment options with you.
- Sometimes biopsy test results are unclear. Your team will recommend what to do next if they think the sample might have cancer.

Questions to ask

- How will tissue be removed from my body for cancer testing?
- Why is this the best procedure for me over the other options?
- Are there risks with the type of procedure I'm getting?
- When and where will the procedure be done?
- How will I feel after the procedure?

What's next?

It's common to have more questions about lung cancer testing. To find out where to get your questions answered, go to *Chapter 8: Other resources*.

"As a lung cancer survivor I've learned the importance of advocating on my own behalf."

8
Other resources

46 What else to know

46 What else to do

47 Questions to ask

Want to learn more? Here's how you can get additional help.

What else to know

This guide helps you know your options so you can make informed decisions and improve your cancer care. But it's not the only resource that you have.

Ask for as much information and help as you need. Many people are interested in learning more about:

- Lung cancer staging and treatment
- Managing fear and anxiety about lung cancer screening tests and results
- How to talk to the people in your life who support you about deciding to start lung cancer screening
- What to do if you may have lung cancer symptoms
- Ways to manage lifestyle-related risk factors for lung cancer

What else to do

Your health care center can help you with next steps. It often has on-site resources to help meet your needs and find answers to your questions. Health care centers can also inform you of resources in your community.

In addition to help from your health care team, the resources listed in the next section provide support for many people like yourself.

Where to get help

Look through the list and visit the provided websites to learn more about these organizations.

A Breath of Hope Lung Cancer Foundation
abreathofhope.org

American Lung Association
lung.org/lung-health-diseases/lung-disease-lookup/lung-cancer

CancerCare
cancercare.org

Cancer Hope Network
cancerhopenetwork.org

Caring Ambassadors Program, Inc.
lungcancercap.org

Free Me from Lung Cancer
freemefromlungcancer.org

Go2 Foundation for Lung Cancer
go2foundation.org

GRACE
cancergrace.org

Imerman Angels
Imermanangels.org

LiveLung (Dusty Joy Foundation)
dustyjoy.org

Lung Cancer Action Network (LungCAN)
lungcan.org

Lung Cancer Foundation of America
lcfamerica.org

Lung Cancer Research Foundation
lcrf.org

LUNGevity
lungevity.org

Triage Cancer
triagecancer.org

Questions to ask

- Who can I talk to about housing, food, and other basic needs?
- What help is available for childcare and home care?
- How can I connect with others and build a support system?
- Who can I talk to if I don't feel safe at home, at work, or in my neighborhood?



Words to know

alveoli
Small air sacs at the end of the bronchioles. From there, oxygen is transferred into your blood.

benign
Tissue without cancer cells.

biopsy
A procedure that removes samples to be tested for a disease. There are different types of biopsies.

bronchioles
The smallest airway branches that bring air into—and carry it away from—the lungs.

bronchus
Each lung has a bronchus, or airway, commonly referred to as a breathing tube that connects the largest airway, the trachea (windpipe), to the lungs.

bronchoscopy
Use of a long, thin device with a tiny light and camera at the end. It is guided down the trachea into the airway branches of the lungs to look at or remove samples for biopsy.

calcium
The most common mineral found in body tissues. Some lung nodules contain calcium in patterns found in diseases that are not cancer, including benign tumors.

cancer screening
The use of a test to find cancer before symptoms of cancer appear.

chronic obstructive pulmonary disease (COPD)
A lung condition that makes it difficult to breathe, and includes emphysema and chronic bronchitis.

computed tomography (CT)
A test that uses many x-rays to make pictures of the inside of the body. Contrast is sometimes used with CT scans.

FDG-PET/CT
A scan that combines positron emission tomography (PET) and computed tomography (CT) done at the same time. It uses a small amount of FDG (fluorodeoxyglucose), a radioactive material, to detect changes in the body at the cellular level.

follow-up test
Used to look at abnormalities found on a screening test to determine if they may represent cancer.

gene
Coded instructions in cells for making new cells and controlling how cells behave.

ground-glass nodule
A collection of cells that form a fuzzy spot on the lungs.

imaging
A test that makes pictures (images) of the insides of the body.

infection
An illness caused by germs.

inflammation
Redness, heat, pain, and swelling caused by injury, infection, or some diseases.

interventional radiologist
A doctor who interprets imaging tests and uses image-guided tools to perform minimally invasive techniques to diagnose or treat cancer and other conditions.

low-dose computed tomography (LDCT)
A test that uses a smaller amount of radiation than a standard chest CT to make pictures of the inside of the body. This test can help find early signs of lung cancer. An LDCT is the first test in a lung cancer screening program.

lung nodule
A small area of abnormal lung tissue, measuring up to 3 cm. A nodule can be described as solid, nonsolid, or part-solid.

lungs
A pair of organs in the body made of airways and air sacs. The left lung has 2 sections called lobes. The right lung has 3 lobes.

malignant
Lung nodules that have cancer cells, are malignant.

pack-years
The number of cigarette packs smoked every day multiplied by the number of years of smoking.

pathologist
A doctor who’s an expert in testing cells and tissue to find disease.

pulmonary fibrosis
A condition that damages the tissue in the lungs.

pulmonologist
A doctor who’s an expert in lung diseases.

radiologist
A doctor who’s an expert in interpreting imaging tests.

respiratory system
The group of organs that takes oxygen in and moves carbon dioxide out of the body.

risk factor
Something that increases the chance of getting a disease.

second-hand smoke
Smoke inhaled involuntarily from someone exhaling smoke or a burning tobacco product.

trachea
The airway that leads to the lungs. Also known as the windpipe. Some lung nodules are found inside of the trachea.

thoracic radiologist
A doctor who's an expert in interpreting imaging tests for lung diseases

thoracic surgeon
A doctor who’s an expert in surgery within the chest.

NCCN Contributors

This patient guide is based on the NCCN Clinical Practice Guidelines in Oncology (NCCN Guidelines®) for Lung Cancer Screening Version 1.2026. It was adapted, reviewed, and published with help from the following people:

Dorothy A. Shead, MS
Senior Director
Patient Information Operations

Stephanie Levin
Medical Writer

Lisa Diehl
Production Layout Artist

The NCCN Clinical Practice Guidelines in Oncology (NCCN Guidelines®) for Lung Cancer Screening Version 1.2026 were developed by the following NCCN Panel Members:

Douglas E. Wood, MD/Chair
Fred Hutchinson Cancer Center

*Ella A. Kazerooni, MD, MS/Vice Chair
University of Michigan Rogel Cancer Center

Denise R. Aberle, MD
UCLA Jonsson Comprehensive Cancer Center

Angela C. Argento, MD
Johns Hopkins Kimmel Cancer Center

Jonathan Baines, MD, PhD
Mayo Clinic Comprehensive Cancer Center

Brian Boer, MD, PhD
Fred & Pamela Buffett Cancer Center

Whitney Brandt, MD
Siteman Cancer Center at Barnes-Jewish Hospital and Washington University School of Medicine

Lisa M. Brown, MD, MAS
UC Davis Comprehensive Cancer Center

Jessica Donington, MD, MSCR
The UChicago Medicine Comprehensive Cancer Center

*Georgie A. Eapen, MD
The University of Texas MD Anderson Cancer Center

J. Scott Ferguson, MD
University of Wisconsin Carbone Cancer Center

Lifang Hou, MD, PhD, MS
Robert H. Lurie Comprehensive Cancer Center of Northwestern University

Donald Klippenstein, MD
Moffitt Cancer Center

Ana S. Kolansky, MD
Abramson Cancer Center at the University of Pennsylvania

Rohit Kumar, MD
Fox Chase Cancer Center

*Lorriana E. Leard, MD
UCSF Helen Diller Family Comprehensive Cancer Center

Ann N. Leung, MD
Stanford Cancer Institute

Robert E. Merritt, MD
The Ohio State University Comprehensive Cancer Center - James Cancer Hospital and Solove Research Institute

*Kim Norris
Lung Cancer Foundation of America

Mark Onaitis, MD
UC San Diego Moores Cancer Center

Sudhakar Pipavath, MD
Fred Hutchinson Cancer Center

Dan Raz, MD, MAS
City of Hope National Medical Center

Chakravarthy Reddy, MD
Huntsman Cancer Institute at the University of Utah

Mary E. Reid, PhD
Roswell Park Comprehensive Cancer Center

Kim L. Sandler, MD
Vanderbilt-Ingram Cancer Center

Jacob Sands, MD
Dana-Farber/Brigham and Women's Cancer Center | Mass General Cancer Center

Matthew B. Schabath, PhD
Moffitt Cancer Center

Catherine R. Sears, MD
Indiana University Melvin and Bren Simon Comprehensive Cancer Center

Jamie L. Studts, PhD
University of Colorado Cancer Center

Lynn Tanoue, MD
Yale Cancer Center/Smilow Cancer Hospital

Amber L. Thacker, MD
St. Jude Children's Research Hospital/ The University of Tennessee Health Science Center

Betty C. Tong, MD, MHS
Duke Cancer Institute

William D. Travis, MD
Memorial Sloan Kettering Cancer Center

*Qian Wang, MD, MPH
Case Comprehensive Cancer Center/ University Hospitals Seidman Cancer Center and Cleveland Clinic Taussig Cancer Institute

Kenneth Westover, MD, PhD
UT Southwestern Simmons Comprehensive Cancer Center

Aline Zouk, MD
O'Neal Comprehensive Cancer Center at UAB

NCCN

Beth McCullough, RN, BS
Guidelines Coordinator

Swathi Ramakrishnan, PhD
Oncology Scientist/Medical Writer

* Reviewed this patient guide. For disclosures, visit NCCN.org/disclosures.

NCCN Cancer Centers

For contact information visit NCCN.org/cancercenters.

Abramson Cancer Center
at the University of Pennsylvania
Philadelphia, Pennsylvania

Case Comprehensive Cancer Center/
University Hospitals Seidman Cancer Center and
Cleveland Clinic Taussig Cancer Institute
Cleveland, Ohio

City of Hope National Medical Center
Duarte, California

Dana-Farber/Brigham and Women's Cancer Center |
Mass General Cancer Center
Boston, Massachusetts

Duke Cancer Institute
Durham, North Carolina

Fox Chase Cancer Center
Philadelphia, Pennsylvania

Fred & Pamela Buffett Cancer Center
Omaha, Nebraska

Fred Hutchinson Cancer Center
Seattle, Washington

Huntsman Cancer Institute at the University of Utah
Salt Lake City, Utah

Indiana University Melvin and Bren Simon
Comprehensive Cancer Center
Indianapolis, Indiana

Johns Hopkins Kimmel Cancer Center
Baltimore, Maryland

Mayo Clinic Comprehensive Cancer Center
Phoenix/Scottsdale, Arizona
Jacksonville, Florida
Rochester, Minnesota

Memorial Sloan Kettering Cancer Center
New York, New York

Moffitt Cancer Center
Tampa, Florida

O'Neal Comprehensive Cancer Center at UAB
Birmingham, Alabama

Robert H. Lurie Comprehensive Cancer Center
of Northwestern University
Chicago, Illinois

Roswell Park Comprehensive Cancer Center
Buffalo, New York

Siteman Cancer Center at Barnes-Jewish Hospital
and Washington University School of Medicine
St. Louis, Missouri

St. Jude Children's Research Hospital/
The University of Tennessee Health Science Center
Memphis, Tennessee

Stanford Cancer Institute
Stanford, California

The Ohio State University Comprehensive Cancer Center -
James Cancer Hospital and Solove Research Institute
Columbus, Ohio

The UChicago Medicine Comprehensive Cancer Center
Chicago, Illinois

The University of Texas MD Anderson Cancer Center
Houston, Texas

UC Davis Comprehensive Cancer Center
Sacramento, California

UC San Diego Moores Cancer Center
La Jolla, California

UCLA Jonsson Comprehensive Cancer Center
Los Angeles, California

UCSF Helen Diller Family Comprehensive Cancer Center
San Francisco, California

University of Colorado Cancer Center
Aurora, Colorado

University of Michigan Rogel Cancer Center
Ann Arbor, Michigan

University of Wisconsin Carbone Cancer Center
Madison, Wisconsin

UT Southwestern Simmons
Comprehensive Cancer Center
Dallas, Texas

Vanderbilt-Ingram Cancer Center
Nashville, Tennessee

Yale Cancer Center/Smilow Cancer Hospital
New Haven, Connecticut

Notes

Index

asbestos 8, 10

biopsy 13, 27, 41–44

bronchoscopy 42

chronic obstructive pulmonary disease (COPD) 8, 11

computed tomography (CT) 16–17, 22

fluorodeoxyglucose positron emission tomography CT (FDG-PET/CT) 23, 27–29, 36

history of cancer 8, 10

low-dose computed tomography (LDCT) 16, 19–23, 43

nodule 16, 19–23

non-small cell lung cancer (NSCLC) 43

nonsolid nodule 21, 32–33

pack-year 11

part-solid nodule 20, 36–37

pulmonary fibrosis 8, 11

pulmonologist 23

radiologist 5, 16–17, 19, 23

radon 8–9

risk factors 5, 8, 11

risk group 11–12

second-hand smoke 8, 11

small cell lung cancer (SCLC) 43

smoking 8–9, 12

solid nodule 21, 26–29

symptoms 5, 9, 12–13



NCCN Guidelines for Patients®

Cancer care recommendations from leading experts at the
National Comprehensive Cancer Network® (NCCN®)

Lung Cancer Screening

To support the NCCN Guidelines for Patients, visit

NCCNFoundation.org/Donate

National Comprehensive Cancer Network®

3025 Chemical Road, Suite 100
Plymouth Meeting, PA 19462
215.690.0300

NCCN.org/patients – For Patients | NCCN.org – For Clinicians

PAT-N-1933-0526