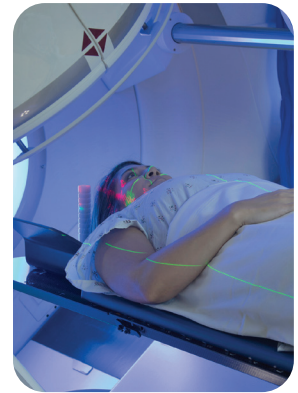


Lung Cancer Screening

What is screening and what does it have to do with lung cancer?

Screening is when a healthcare provider looks for a disease before symptoms arise. Healthcare providers screen for diseases that are easier to treat and potentially cure when detected early. Other cancers for which your healthcare provider may screen you include breast cancer and colon cancer. Lung cancer is a good example of a disease that does not usually cause noticeable symptoms until the disease is advanced. When lung cancer is detected in its earliest stages, it may be curable. However, when discovered in more advanced stages, lung cancer is often incurable and is the #1 cause of cancer related death worldwide.



For decades, healthcare providers and researchers have been trying to identify the best way to diagnose lung cancer before symptoms appear. As part of this effort, a research study called the **National Lung Cancer Screening Trial** was conducted with over 50,000 patients. The study found that yearly chest CT scans (sometimes referred to as “cat scans”) in high risk patients discovered lung cancers early and saved lives.

What is a CT scan and are there harms associated with lung cancer screening?

A CT scanner is a machine that allows healthcare providers to see inside your lungs. It creates a series of chest x-rays that are aligned by a computer to form a 3D image of your lungs. These images show much more detail than a usual chest x-ray. CT scans performed during lung cancer screening use low dose scanning, making them safer with respect to radiation dose. Healthcare providers interpret these scan images and look for patterns that might represent lung cancer. The main findings of concern are pulmonary nodules, or “spots on the lung”. Most pulmonary nodules are not cancer, but rarely they can be early forms of cancer. If a pulmonary nodule is detected, your healthcare provider may recommend a lung biopsy. Although biopsies are safe, all procedures have some risk of complications. Thus, healthcare providers try to perform lung cancer screening and biopsies only on patients with the highest risk of

developing cancer. Key risk factors include older age and a history of heavy cigarette smoking.

Who should undergo lung cancer screening?

Lung cancer screening is not for everyone. You should talk with your healthcare provider about how lung cancer screening might impact you. This process is called “**shared decision making**” and the discussion about whether you undergo screening should involve the following key questions:

- What is your risk of developing lung cancer?
- Would you want to undergo additional diagnostic procedures if a suspicious nodule is identified?
- Would you want treatment for lung cancer if it is diagnosed?
- Are you healthy enough to undergo other procedures and therapies if you are diagnosed with lung cancer?

You should consider being screened if you have all three of the following risk factors for lung cancer:

- You are between the ages of 50-80
- You currently smoke cigarettes or have quit smoking within the past 15 years
- You smoked the equivalent of 1 pack of cigarettes a day for at least 20 years (a term called “pack years”)

What happens after I get my CT scan?

Your healthcare provider will review the results of the scan with you. Typically, the recommendation will be one of the following:

- Repeat CT scan in some time frame (such as 3 months, 6 months, or 12 months).
- A different type of scan called a PET (positron emission tomography) scan. PET scans use an injection of a sugar connected to a safe radioactive tracer to create color imaging of your body's organs and tissues based on their uptake of the tracer sugar. Your healthcare provider can explain how a PET scan differs from CT imaging and when it is helpful.
- Lung biopsy to get a sample from a suspicious looking nodule or area of the lung.

Are there risks to undergoing lung cancer screening?

Yes. There are 3 primary risks associated with lung cancer screening.

- The risk associated with the low dose CT scan. Doctors will minimize the amount of radiation exposure. This risk is thought to be low when compared to the cancer risk associated with smoking.
- The risk of undergoing a biopsy if a high-risk or suspicious nodule is identified. The main risks of a biopsy include:
 - Bleeding—Bleeding is typically very mild and is usually observed. You may need to hold any medications that may increase your risk of bleeding before a biopsy is done.
 - Collapsed lung—though uncommon, the biopsy needle can cause lung injury (pneumothorax) where air would accumulate around the lung. Typically, the lung can heal itself very quickly without any additional interventions. Sometimes the air needs to be drained to prevent the lung from collapsing. This may require a chest tube to be inserted into your chest.
- The anxiety associated with discovering nodules that do not represent cancer, but may require a biopsy or more frequent CT scans. To biopsy a nodule, a needle is advanced into the nodule to get a tissue sample to examine its cells. Biopsies are typically done either through bronchoscopy where a small camera is placed through the airways into your lungs to guide a needle into the nodule or by using a CT scanner to guide a needle through your skin and chest wall into the nodule.

Is there anything I can do to reduce my risk of developing lung cancer?

The most important thing you can do to reduce your risk of developing lung cancer is to stop smoking.

There are many effective treatment options for tobacco dependence. Speak to your healthcare provider about the method that might be best for you.

If you stop smoking, your risks of developing lung cancer will drop dramatically, although it will always be higher than someone who never smoked.

There are other environmental exposures that might increase your risk of developing lung cancer as well. These exposures include asbestos and radon. Avoiding exposure to these risks factors is another important way to reduce your risk of developing lung cancer. You can learn more about these risks in the environment at the US Environmental Protection Agency website (<https://www.epa.gov/radon>).

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Resources:

American Thoracic Society

- www.thoracic.org/patients
 - Lung cancer
 - Pulmonary nodule
 - Flexible bronchoscopy
 - Chest tube thoracostomy
 - Lung cancer prevention
 - Stopping smoking and vaping
 - Prescription medicines to help you stop smoking
 - OTC medicines to help you stop smoking
 - Smoking Cessation and Cancer

Agency for Health Care Research and Quality

- <https://effectivehealthcare.ahrq.gov/decision-aids/lung-cancer-screening/home.html>

Environmental Protection Agency

- www.epa.gov

American Cancer Society

- <https://www.cancer.org/cancer/lung-cancer.html>

American Lung Association

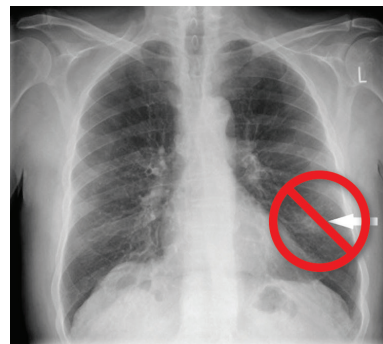
- <https://www.lung.org/lung-health-diseases/lung-disease-lookup/lung-cancer>
- <https://www.lung.org/quit-smoking>

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Lung Cancer Prevention

What are the chances that I will develop lung cancer?

The #1 cause of lung cancer is exposure to tobacco smoke. Your chances increase with the amount you smoke and the number of years you have smoked. The more you smoke or are exposed to smoke from others (second-hand smoke), the greater your chances of developing lung cancer. People who have never smoked may develop lung cancer, but their chance is much less than people who smoke or who used to smoke.



What can I do to decrease my risk of developing lung cancer?

The best way to lower your risk is to avoid tobacco smoke. It is never too late to stop smoking, but the sooner you stop, the better. Even if you can't quit completely, cutting back on the number of cigarettes you smoke can help, but cutting down is not as good as quitting completely.

There are many ways to stop smoking including counseling, nicotine replacement and medications. It takes most people several tries before they quit for good. So don't be discouraged. If at first you don't succeed, keep trying! For help in stopping smoking go to www.thoracic.org/patients.

Are there other ways to decrease my risk of getting lung cancer?

There are many things that may reduce your risk, but none have been proven. These include:

- eating plenty of fruit
- getting regular exercise
- regular use of aspirin or celecoxib (Brand name Celebrex)
- regular use of inhaled corticosteroids (used for emphysema and asthma)

Eating more fruit and exercising are not likely to harm you, but speak with your healthcare provider before making major changes in your diet and activity. Talk to your healthcare provider before

taking any new medications, including regular use of non-prescription medications.

Are there things that increase my chances of getting lung cancer?

There are several things that we know increase your risk of getting lung cancer. There are other things that may increase your risk but we don't have enough information to say for sure. These things increase your risk for lung cancer and should be avoided if possible:

- tobacco smoke
- exposure to or working with hazardous chemicals such as silica, cadmium, arsenic, beryllium, chromium, diesel fumes, nickel, coal smoke and soot
- exposure to particle pollution—like exhaust smoke.
- asbestos, a mineral formerly used in building materials that is still in some environments and products like old brake pads.
- radon, a radioactive gas that can be found in the environment. You can have levels checked if you live in a high risk area.
- high doses of supplemental beta-carotene (a pigment found in plants and fruits) above the Recommended Daily Allowance. Risk with high levels is mainly seen in former and current smokers.

Things that may increase your risk of getting lung cancer include:

- supplements with high doses of vitamin E (above the Recommended Daily Allowance)
- hormone replacement therapy (estrogen plus progestin)
- heavy alcohol use
- vaping has been shown to cause lung injury, but it is not known if it increases risk of lung cancer.

Talk to your healthcare provider about the risks and benefits before starting or stopping any medication or vitamin.

There are some other risks to lung cancer that you cannot avoid. You can discuss with your healthcare provider. These include:

- family history of lung cancer
- a personal history of other cancer
- a personal history of COPD or pulmonary fibrosis.

What about screening for lung cancer?

The most effective way to reduce the chance of getting lung cancer is to stop smoking. There is also considerable interest in diagnosing lung cancer at an early stage, before it causes symptoms and when it is most treatable. This is called screening.

Research has found that using CT (“cat”) scans, computerized imaging of the chest or lungs, for screening reduced the number of people who died from lung cancer. As a result, several organizations, including the American Thoracic Society and the United States Preventive Services Task Force now recommend that healthcare providers consider ordering a chest CT for lung cancer screening for adults with a history of cigarette smoking. Talk to your healthcare provider about the risks and benefits of screening for you. There are decision guides that can help you weigh the risks and benefits of having a CT for lung cancer screening. You can find one of these on AHRQ website listed under resources.

For more information about the risks and benefits of CT scan screening for lung cancer, go to www.thoracic.org/patients.

Summary

Lung cancer is a common form of cancer. There are things you can do to lower your risk of lung cancer.

- stop smoking tobacco
- ask your health care provider for help in quitting, including use of medicines to help with nicotine dependence
- discuss with your healthcare provider, what you are taking or doing to decrease your risk for lung cancer



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For More Information

Agency for Healthcare Research and Quality (AHRQ)—US Dept of Health and Human Services—Lung Cancer Screening Tools

- <https://effectivehealthcare.ahrq.gov/decision-aids/lung-cancer-screening/home.html>

American Lung Association

- www.lungusa.org

American Thoracic Society

- thoracic.org/patients

National Cancer Institute

- www.cancer.gov/cancertopics/tobacco/smoking
- <http://www.cancer.gov/newscenter/qa/2002/NLSTstudyGuidePatientsPhysicians>

National Cancer Institute’s guide to the risks and benefits of lung cancer screening

Lung Cancer Research Foundation

- www.freetobreathe.org

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