

Risk Factors for Lung Cancer

Key Influences That Increase the Risk of Developing Lung Cancer

Lung cancer is one of the top causes of cancer deaths worldwide, killing about 1.8 million people each year, which is 18% of all cancer deaths. One of the most common risk factors for lung cancer is smoking. Smoking increases the risk because tobacco smoke contains harmful chemicals that damage lung cells, making it easier for cancer to develop over time. However, smoking is not the only cause of lung cancer; other factors can also play a role.

Some people might wonder if non-smokers are safe from lung cancer. While smoking is a major risk factor, non-smokers can still develop lung cancer due to other reasons, such as genetic factors, exposure to substances like radon or asbestos, air pollution, or chronic lung diseases.[1] In some cases, lung cancer happens because of a combination of these factors, regardless of smoking habits. [1]

Lung cancer risk factors are of different types. Some are genetic (unavoidable risks), while others are related to environment or lifestyle (avoidable risks). It is important to understand that these factors don't always directly cause lung cancer but significantly increase the risk. Awareness of what contributes to lung cancer risk empowers individuals to make informed health decisions, take preventive measures, and prioritize early detection. [2]

Let's delve into the different types of risk factors that play a role in lung cancer.

Lung cancer risk factors are primarily categorized into unavoidable and avoidable factors.

Unavoidable Risk Factors

Unavoidable risk factors for lung cancer are things you can't change, like getting older, having a family history of lung cancer, or inheriting certain genes.

These factors make you more likely to get lung cancer. Understanding these factors helps guide decisions on genetic testing and early screening for lung cancer.

The following are the most common risk factors for lung cancer that cannot be avoided or changed:

- **Age**

Lung cancer is more likely to develop in older adults, especially those over 60, because of years of exposure to carcinogens and the natural aging process of cells. As we get older, the body's ability to fix DNA damage weakens, allowing mutations that can lead to cancer. Studies, including one published in *Nature Genetics* (2021), show that the risk increases significantly after 55, as older individuals accumulate more mutations in their lung cells, making cancer more likely. [3]

- **Genetic Predisposition**

Genetics can play a role in increasing the risk of lung cancer, even for people who don't smoke. If someone in your family has had lung cancer, your risk is higher. Certain gene changes, like those in the EGFR or ALK genes, can make lung cells more likely to become cancerous. Studies show that if a close family member had lung cancer, you're more likely to get it too. [4]

- **Air Pollution**

Air pollution damages the lungs by causing inflammation and stress, which can harm cells and lead to mutations. Tiny particles from vehicle emissions, industrial pollution, and burning fuels enter deep into the lungs, reducing their function and weakening natural defenses. Harmful chemicals like nitrogen oxides and carcinogens from smoke and fumes can damage DNA, increasing the risk of cancer. Over time, this persistent damage creates a higher likelihood of developing lung diseases, including lung cancer, even though the risk is lower compared to smoking. [5]

- **Previous Lung Diseases**

Previous lung diseases like COPD, pulmonary fibrosis, and tuberculosis increase the risk of lung cancer. Chronic inflammation and scarring from these conditions damage lung tissue, making it more prone to cancerous changes, even in non-smokers. [6]

- **Gender**

Lung cancer has been more common in men because of higher smoking rates, but women may be more likely to develop it. Research shows that women's lungs might be more sensitive to the harmful effects of smoking, and differences in hormones could play a role. Even women who have never smoked are at a higher risk than men, which has led scientists to study how hormones and genetics might affect this increased risk in women. [7]

Avoidable Risk Factors

Avoidable risk factors for lung cancer involve changes in lifestyle and environment. Quitting smoking and avoiding secondhand smoke are the most effective ways to reduce risk.

These actions not only decrease the chance of lung cancer but also support overall health.

The following are the most common risk factors for breast cancer that can be avoided or adjusted:

- **Smoking**

Smoking is the leading cause of lung cancer, responsible for about 85% of cases. The risk increases with the number of cigarettes smoked and the length of time spent smoking, with smokers being 15 to 30 times more likely to develop lung cancer than non-smokers. Even smoking a little can harm your lungs because tobacco smoke contains many harmful chemicals. These include tar, which sticks to the lungs and makes it harder to breathe; formaldehyde, which irritates the lungs and causes damage; benzene, which weakens the immune system and can cause

cancer; and polycyclic aromatic hydrocarbons (PAHs), which damage DNA and increase the risk of cancer. All of these chemicals can seriously harm the lung tissue, making it harder for the lungs to work properly and increasing the risk of lung diseases.

These harmful substances damage lung tissue and cause mutations that can lead to cancer. Quitting smoking, even for long-term smokers, significantly reduces the risk over time. [8]

- **Secondhand smoke**

Secondhand smoke, or passive smoke, is the smoke from someone else's cigarette, pipe, or cigar. It contains many harmful chemicals, many of which can cause cancer. Non-smokers who live with smokers have a 20-30% higher risk of developing lung cancer due to constant exposure. Secondhand smoke poses a serious health risk, as it contains the same toxic substances found in smoke inhaled directly by smokers. To reduce this risk, it's important to avoid areas with secondhand smoke, support smoke-free environments, and encourage smokers to quit. [9]

- **Use of Beta-Carotene Supplements**

High doses of beta-carotene supplements can increase the risk of lung cancer in heavy smokers. Beta-carotene, which is converted into Vitamin A, can be harmful when taken as a supplement by people already exposed to the cancer-causing chemicals in tobacco smoke. Smokers should avoid high-dose beta-carotene supplements and instead focus on getting nutrients from a balanced diet with plenty of fruits and vegetables. [10]

- **Diet and Lifestyle Factors**

A poor diet and lack of exercise can indirectly increase the risk of lung cancer. Diets low in fruits and vegetables may not provide enough antioxidants and nutrients needed to protect lung cells from damage. Heavy alcohol use, especially in smokers, can also raise the risk. To reduce the risk, it's important to eat a balanced diet rich in fruits, vegetables, whole grains, and lean proteins, along with staying physically active. These healthy habits can support overall health and may lower the chance of developing lung cancer. [11]

- **Radon exposure**

Radon is a natural radioactive gas that can enter homes through cracks in the foundation. It is the second leading cause of lung cancer in the U.S. Since radon has no smell and can't be seen, it's hard to detect without a test. To lower exposure, it's important to test homes for radon and use simple radon-reducing systems if needed. These systems can effectively decrease radon levels in homes. [12]

- **Asbestos**

Asbestos is a mineral once widely used in construction materials like insulation, roofing, and tiles. When asbestos fibers are disturbed, they can become airborne and, if inhaled, increase the risk of lung cancer. Asbestos exposure is particularly dangerous for smokers. Since asbestos fibers are tiny and can't be seen, they pose a hidden threat in older buildings. To reduce exposure, it's important to avoid disturbing asbestos materials and hire professionals for safe removal if necessary. Proper safety

measures, such as wearing protective gear and ensuring good ventilation, can also help lower the risk. [13]

Next Steps

For further information on reducing cancer risk, consider reading the article on "[Early Detection and Screening for Lung Cancer](#)".

References:

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Infographics Section

Fig1: Risk Factors for lung cancer

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