

How to Use this Factsheet

This risk factor summary was developed to serve as a general fact sheet. It is an overview and should not be considered exhaustive. For more information on other possible risk factors and health effects being researched, please see the References section.

A risk factor is anything that increases a person's chance of developing cancer. Some risk factors can be controlled while others cannot. Risk factors can include *hereditary conditions, medical conditions or treatments, infections, lifestyle factors, or environmental exposures*. Although risk factors can influence the development of cancer, most do not directly cause cancer. An individual's risk for developing cancer may change over time due to many factors, and it is likely that multiple risk factors influence the development of most cancers. Knowing the risk factors that apply to specific concerns and discussing them with your health care provider can help to make more informed lifestyle and health care decisions.

For those cancer types with environmentally-related risk factors, an important factor in evaluating cancer risk is the route of exposure. This is particularly relevant when considering exposures to chemicals in the environment. For example, a particular chemical may have the potential to cause cancer if it is inhaled, but that same chemical may not increase the risk of cancer through skin contact. In addition, the dose and duration of time one might be exposed to an environmental agent is important in considering whether an adverse health effect could occur.

Gene-environment interactions are another important area of cancer research. An individual's risk of developing cancer may depend on a complex interaction between their genetic makeup and exposure to an environmental agent (for example, a virus or a chemical contaminant). This may explain why some individuals have a fairly low risk of developing cancer as a result of an environmental factor or exposure, while others may be more vulnerable.

Key Statistics

Lung and bronchus cancer is the second most common cancer in both men (after prostate cancer) and women (after breast cancer). The American Cancer Society estimates 221,200 individuals will be diagnosed with lung and bronchus cancer in the U.S. in 2015: 115,610 men and 105,590 women.^{1, 2} In Massachusetts, lung and bronchus cancer is expected to account for about 14% of all cancers diagnosed within the state in 2015.¹ These cancers mainly occur in older individuals, with roughly two-thirds of those diagnosed older than 65 years of age. Fewer than 2% of diagnoses occur in individuals under the age of 45. The incidence of lung and bronchus cancer is greater among men than women. African American men are more likely to develop lung and bronchus cancer than white men, while African American women are slightly less likely to develop it than white women. For several years, the incidence rate dropped among men and is just beginning to drop among women after a long period of rising.^{2, 10}

Types of Lung and Bronchus Cancer

The term "cancer" is used to describe a variety of diseases associated with abnormal cell and tissue growth. Cancers are classified by the location in the body where the disease originated (the primary site) and the tissue or cell type of the cancer (histology).

Lung and bronchus tumors can be either malignant (cancerous) or benign (non-cancerous).⁸ The lung and bronchus are sites where both primary and secondary tumors can arise; secondary lung and bronchus tumors generally originate elsewhere in the body and then metastasize, or spread, to the lung or bronchus.² There are two main types of primary lung and bronchus cancers: small cell lung cancer (SCLC) and non-small cell lung cancer (NSCLC).^{8, 11} About 85% to 90% of lung and bronchus cancers are NSCLC, of which there are three subtypes: adenocarcinoma, squamous cell carcinoma, and large-cell (undifferentiated) carcinoma. Adenocarcinoma is usually found in the outer region of the lung and is the most common subtype in the U.S., accounting for about 40% of lung and bronchus cancer diagnoses. Squamous cell carcinoma accounts for about 25% to 30% of lung and bronchus cancers and tends to be found in the middle of the lungs, near a bronchus. Large-cell carcinoma accounts for about 10% to 15% of lung and bronchus cancers and may appear in any part of the lung. SCLC also accounts for about 10% to 15% of all lung and bronchus cancers but often starts in the bronchi. Additional rare types of lung and bronchus cancers include carcinoid tumors, adenoid cystic carcinomas, and hamartomas, among others.²

Established Risk Factors

Hereditary Conditions

Siblings and children of those who have had lung or bronchus cancer may have a slightly higher risk themselves; however, it is not clear whether this risk may be attributed to hereditary conditions or to shared exposures (such as tobacco smoke or radon). Genetics do seem to play a role in some families with a strong history of lung and bronchus cancer. Individuals who inherit certain DNA changes are more likely to develop lung and bronchus cancer. Although these changes cannot be routinely tested for at this time, research is ongoing.²

Medical Conditions

Individuals who have had lung or bronchus cancer have a higher risk of developing a second lung or bronchus tumor. In addition, individuals who have had radiation therapy to the chest for cancer are at higher risk for lung and bronchus cancer, particularly if they smoke. Typical patients are those treated for Hodgkin disease or women who get radiation after a mastectomy for breast cancer. Women who receive radiation therapy to the breast after a lumpectomy do not appear to have an elevated risk of lung and bronchus cancer.²

Risk Factor Information for Lung and Bronchus Cancers

Lifestyle Factors

Smoking is by far the most important risk factor for lung and bronchus cancer. For example, SCLC is almost always caused by smoking and rarely develops in an individual who has never smoked.³ The risk of lung and bronchus cancer increases with the quantity and duration of cigarette consumption. Smoking of cigars and pipes is almost as likely to cause lung and bronchus cancer as cigarette smoking. Furthermore, smoking low tar or “light” cigarettes increases the risk of lung and bronchus cancer just as much as regular cigarettes. Mentholated cigarettes are thought to increase the risk of lung and bronchus cancer even more since the menthol allows smokers to inhale more deeply.^{2, 3}

At least 80% of deaths from lung and bronchus cancer are thought to result from smoking.^{2, 3, 12} If an individual stops smoking before a cancer develops, the damaged lung tissue gradually repairs itself. No matter the age of an individual or how long someone has smoked, quitting may help an individual to live longer.^{2, 3} Information about quitting smoking and related services are available from the Massachusetts DPH Tobacco Cessation and Prevention Program at 1-800-Quit-Now or 1-800-784-8669.

Breathing in the smoke of others (called secondhand smoke) at home and in the workplace also increases an individual’s risk of developing lung and bronchus cancer. A nonsmoker who lives with a smoker has about a 20% to 30% greater risk of developing lung cancer. Some evidence suggests that some people may be more susceptible to the cancer-causing effect of tobacco smoke than others.^{2, 3}

Environmental Exposures

Exposure to radon (a naturally occurring radioactive gas produced by the breakdown of uranium in soil and rocks) has been identified as the second leading cause of lung and bronchus cancer, and the leading cause among nonsmokers. The level of radon that occurs outdoors is not dangerous. However, indoor levels of radon can be more concentrated and may increase the risk of developing lung and bronchus cancer.⁶ According to the World Health Organization, radon may account for up to 14% of lung cancers worldwide.¹⁴ Houses that are built on soil with natural uranium deposits can create high levels of indoor radon, particularly in basements.⁶ If you are concerned about radon exposure, contact the MDPH Indoor Air Quality Program, Radon Unit at 1-800-723-6695.

Occupational exposure to asbestos is an important risk factor for lung and bronchus cancer. Asbestos may occur in mines, mills, textile plants, shipyards, and where insulation is used. In recent years, government regulations have reduced the use of asbestos in commercial and industrial products. It is still present in many homes and commercial buildings but is not usually considered harmful as long as it is not released into the air by deterioration, demolition, or renovation.^{2, 3, 5}

In addition to asbestos and radon, chemical compounds that are also occupational risk factors for lung and bronchus cancer include arsenic, beryllium, cadmium, silica, vinyl

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chloride, nickel compounds, chromium compounds, coal products, mustard gas, chloromethyl ethers, diesel exhaust and radioactive ores such as uranium.^{2, 3} The risk of lung and bronchus cancer from each of the above mentioned substances is even higher for smokers.¹²

Possible Risk Factors

Medical Conditions

Having certain lung diseases, such as tuberculosis or bronchitis, for many years may increase the risk of developing lung and bronchus cancer.¹²

Lifestyle Factors

Some evidence suggests that a diet high in fruits and vegetables may help protect against lung and bronchus cancer. But any positive effect of fruits and vegetables on reducing risk would be much less than the negative effects of smoking in increasing risk. It should be noted, however, that two large studies examining the possible role of antioxidant supplements in reducing the risk of lung and bronchus cancer found that smokers who took beta carotene supplements actually had an *increased* risk.^{2, 3, 12} The results of these studies suggest that smokers should avoid taking beta carotene supplements.

Environmental Exposures

High levels of arsenic in drinking water may increase the risk of lung cancer. In addition, air pollution appears to slightly raise the risk of lung and bronchus cancer in cities.^{2, 3, 12}

Other Risk Factors That Have Been Investigated

Marijuana use is believed to increase the risk of lung and bronchus cancer due to its high tar content. However, the effects of this possible association have proven difficult to study due to its illegal nature and the fact that many marijuana users also smoke cigarettes.^{2, 3}

Talc is a mineral that may contain asbestos in its natural form. Previous studies suggested that talc miners and millers have a higher risk of lung and bronchus cancer due to their exposure to industrial grade talc but recent studies did not find this association. Talcum powder is made from talc. Since 1973, all home-use talcum products, such as baby, body, and facial powders, have been asbestos-free by law.^{2, 3}

Lung and Bronchus Cancers in Children

Fewer than 2% of lung and bronchus cancers occur in individuals under the age of 45.^{2, 3} Pleuropulmonary blastoma (PPB) is a rare type of childhood lung cancer that occurs most often in children under the age of four. As few as 10 to 20 individuals are diagnosed with PPB each year in the United States.⁷

For More Information / References

Much of the information contained in this summary has been taken directly from the following sources. This material is provided for informational purposes only and should not be considered as medical advice. Persons with questions regarding a specific medical problem or condition should consult their physician.

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