About Small Cell Lung Cancer

Overview

If you have been diagnosed with small cell lung cancer or are worried about it, you likely have a lot of questions. Learning some basics is a good place to start.

- What Is Small Cell Lung Cancer?

Research and Statistics

See the latest estimates for new cases of small cell lung cancer and deaths in the US and what research is currently being done.

- Key Statistics for Small Cell Lung Cancer
- What's New in Small Cell Lung Cancer Research?

What Is Small Cell Lung Cancer?

Lung cancer starts when cells of the lung become abnormal and begin to grow out of control. As more cancer cells develop, they can form into a tumor and spread to other areas of the body. To learn more about how cancers start and spread, see What Is Cancer?[1]

Types of lung cancer

The 2 main types of lung cancer are:

- **Small cell lung cancer (SCLC)**, which is sometimes called *oat cell cancer*. About 10% to 15% of lung cancers are SCLC.
- **Non-small cell lung cancer (NSCLC)**, which makes up about 80% to 85% of lung cancers. The 3 main types of NSCLC are adenocarcinoma, squamous cell carcinoma, and large cell carcinoma.

Small cell and non-small cell lung cancers are treated differently. **The information here focuses on small cell lung cancer.** See Lung Cancer (Non-Small Cell)[2] for information about that type of lung cancer.

Other types of lung cancer and tumors

Lung carcinoid tumors: Less than 5% of lung tumors are carcinoid tumors of the lung. Most of these grow slowly. For more information about these tumors, see Lung Carcinoid Tumor[3].

Other lung tumors: Other types of lung cancer such as adenoid cystic carcinomas, lymphomas, and sarcomas, as well as benign lung tumors such as hamartomas are rare. These are treated differently from the more common lung cancers and are not discussed here.

Cancers that spread to the lungs: Cancers that start in other organs (such as the breast[4], pancreas[5], kidney[6], or skin[7]) can sometimes spread (metastasize) to the lungs, but these are not lung cancers. For example, cancer that starts in the breast and spreads to the lungs is still breast cancer, not lung cancer. Treatment for metastatic cancer to the lungs is based on where it started (the primary cancer site).

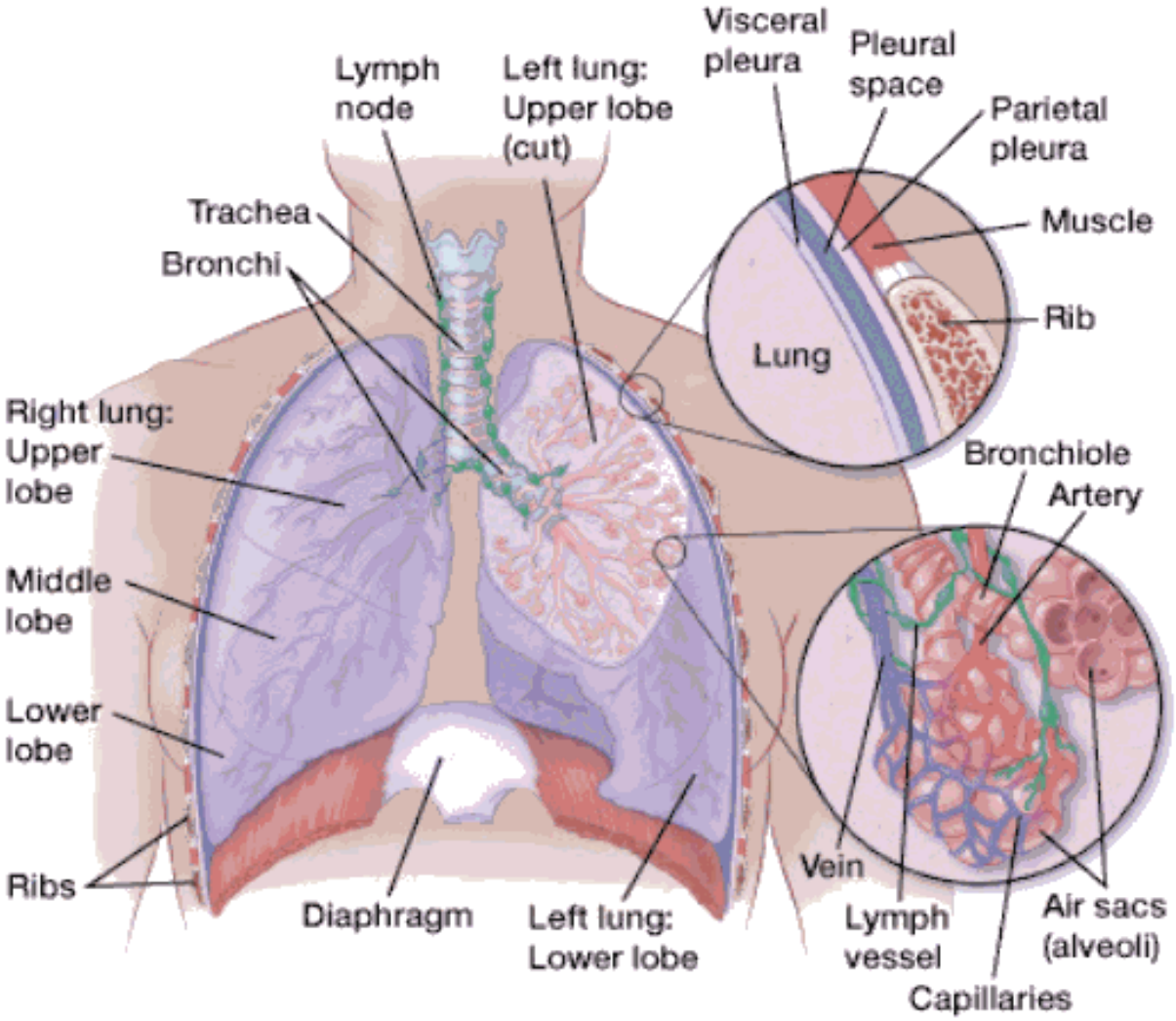
About the lungs

Your lungs are 2 sponge-like organs in your chest. Your right lung has 3 sections, called *lobes*. Your left lung has 2 lobes. The left lung is smaller because your heart takes up more room on that side of the body.

When you breathe in, air enters through your mouth and nose and goes into your lungs through the *trachea* (windpipe). The trachea divides into tubes called the *bronchi* (singular, *bronchus*), which enter the lungs and divide into smaller branches called bronchioles. At the end of the bronchioles are tiny air sacs known as *alveoli*.

The alveoli absorb oxygen from the inhaled air into your blood and remove carbon dioxide from the blood. This leaves the body when you exhale. Taking in oxygen and getting rid of carbon dioxide are your lungs' main functions.

Lung cancers typically start in the cells lining the bronchi and parts of the lung such as the bronchioles or alveoli.



A thin lining called the *pleura* surrounds the lungs. The pleura protects your lungs and helps them slide back and forth against the chest wall as they expand and contract during breathing.

Below the lungs, a thin, dome-shaped muscle called the *diaphragm* separates the chest from the abdomen. When you breathe, the diaphragm moves up and down, forcing air in and out of the lungs.

Hyperlinks

1. www.cancer.org/cancer/cancer-basics/what-is-cancer.html
2. www.cancer.org/cancer/non-small-cell-lung-cancer.html
3. www.cancer.org/cancer/lung-carcinoid-tumor.html
4. www.cancer.org/cancer/breast-cancer.html
5. www.cancer.org/cancer/pancreatic-cancer.html
6. www.cancer.org/cancer/kidney-cancer.html
7. www.cancer.org/cancer/skin-cancer.html

References

See all references for Small Cell Lung Cancer (www.cancer.org/cancer/small-cell-lung-cancer/references.html)

Last Medical Review: February 22, 2016 Last Revised: May 16, 2016

Key Statistics for Small Cell Lung Cancer

Most lung cancer statistics include both small cell lung cancer (SCLC) and non-small cell lung cancer (NSCLC). In general, SCLC accounts for about 10% to 15% of all lung cancers.

How common is lung cancer?

Lung cancer (both small cell and non-small cell) is the second most common cancer in both men and women (not counting skin cancer[1]). Prostate cancer[2] is more common in men, while breast cancer[3] is more common in women. About 14% of all new cancers are lung cancers.

The American Cancer Society's estimates for lung cancer (including both small cell and non-small cell) in the United States for 2019 are:

- About 228,150 new cases of lung cancer (116,440 in men and 111,710 in women)
- About 142,670 deaths from lung cancer (76,650 in men and 66,020 in women)

Lung cancer is by far the leading cause of cancer death among both men and women. Each year, more people die of lung cancer than from colon[4], breast, and prostate cancers combined.

Lung cancer mainly occurs in older people. Most people diagnosed with lung cancer are 65 or older, while a very small number of people diagnosed are younger than 45. The average age at the time of diagnosis is about 70.

Lifetime chance of getting lung cancer

Overall, the chance that a man will develop lung cancer in his lifetime is about 1 in 15; for a woman, the risk is about 1 in 17. Smoking can greatly affect these lifetime risks. For smokers the risk is much higher, while for non-smokers the risk is lower.

- Black men are about 20% more likely to develop lung cancer (including all types) than are white men. The rate is about 10% lower in black women than in white women.
- Women (black and white) have lower rates than men, but the gap is closing. This is because the lung cancer rate has been dropping among men over the past few decades, but only for about the last decade in women.
- Despite their overall risk of lung cancer being higher, black men are about 15% *less* likely to develop SCLC than are white men, and the risk is about 30% lower in black women than in white women.

Statistics on survival in people with SCLC vary depending on the stage (extent) of the cancer when it is diagnosed. For survival statistics by stage, see Small Cell Lung Cancer Survival Rates, By Stage[5].

Visit the American Cancer Society's Cancer Statistics Center for more key statistics.

Hyperlinks

1. www.cancer.org/cancer/skin-cancer.html
2. www.cancer.org/cancer/prostate-cancer.html
3. www.cancer.org/cancer/breast-cancer.html

4. www.cancer.org/cancer/colon-rectal-cancer.html
5. www.cancer.org/cancer/small-cell-lung-cancer/detection-diagnosis-staging/survival-rates.html

References

American Cancer Society. *Facts & Figures 2019*. American Cancer Society. Atlanta, Ga. 2019.

Howlader N, Noone AM, Krapcho M, Miller D, Bishop K, Kosary CL, Yu M, Ruhl J, Tatalovich Z, Mariotto A, Lewis DR, Chen HS, Feuer EJ, Cronin KA (eds). SEER Cancer Statistics Review, 1975-2014, National Cancer Institute. Bethesda, MD, https://seer.cancer.gov/csr/1975_2014/, based on November 2016 SEER data submission, posted to the SEER web site, April 2017.

Cancer Stat Facts: Lung and bronchus cancer, 2010-2014. National Cancer Institute, Bethesda, MD. https://seer.cancer.gov/statfacts/html/lungb.html. Accessed on January 5, 2018.

See all references for Small Cell Lung Cancer (www.cancer.org/cancer/small-cell-lung-cancer/references.html)

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What's New in Small Cell Lung Cancer Research?

Research into the prevention[1], early detection[2], and treatment[3] of small cell lung cancer (SCLC) is being done in many medical centers throughout the world.

Prevention

Tobacco

Prevention offers the greatest opportunity to fight lung cancer. Although decades have passed since the link between smoking and lung cancers became clear, smoking is still responsible for most lung cancer deaths. Research is continuing on:

- Ways to help people quit smoking[4] and stay tobacco-free through counseling, nicotine replacement, and other medicines
- Ways to convince young people to never start smoking
- Inherited differences in genes that may make some people much more likely to get lung cancer if they smoke or are exposed to someone else's smoke

Environmental causes

Researchers also continue to look into some of the other causes of lung cancer, such as exposure to radon[5] and diesel exhaust[6]. Finding new ways to limit these exposures could potentially save many more lives.

Diet, nutrition, and medicines

Researchers are looking for ways to use vitamins or medicines to help prevent lung cancer in people at high risk, but so far none have been shown clearly to reduce risk.

Some studies have suggested that a diet high in fruits and vegetables may offer some protection, but more research is needed to confirm this. While any protective effect of fruits and vegetables on lung cancer risk is likely to be much smaller than the increased risk from smoking, following the American Cancer Society Dietary Recommendations[7] (such as staying at a healthy weight and eating a diet high in fruits, vegetables, and whole grains) may still be helpful.

Early detection

As mentioned in the section Can Small Cell Lung Cancer Be Found Early?[8], screening with spiral CT scans in people at high risk of lung cancer (due to smoking history) has been found to lower the risk of death from lung cancer, when compared to chest x-rays.

Another approach now being studied uses newer, sensitive tests to look for cancer cells in sputum samples. Researchers have found several changes often seen in the DNA of lung cancer cells. Studies are looking at tests that can spot these DNA changes to see if they can find lung cancers at an earlier stage.

Diagnosis

Fluorescence bronchoscopy

Also known as *autofluorescence bronchoscopy*, this technique might help doctors find some lung cancers earlier, when they are likely to be easier to treat. For this test, the doctor inserts a bronchoscope through the mouth or nose and into the lungs. The end of the bronchoscope has a special fluorescent light on it, instead of a normal (white) light.

The fluorescent light causes abnormal areas in the airways to show up in a different color than healthy parts of the airway. Some of these areas might not be visible under white light, so the color difference can help doctors find these areas sooner. Some cancer centers now use this technique to look for early lung cancers, especially if there are no obvious tumors seen with normal bronchoscopy.

Virtual bronchoscopy

This imaging test uses a chest CT scan to create a detailed 3-dimensional picture of the airways in the lungs. The images can be seen as if the doctor were actually using a bronchoscope.

Virtual bronchoscopy has some possible advantages over standard bronchoscopy. First, it is non-invasive and doesn't require anesthesia. It also helps doctors look at some airways that they might not be able to reach with standard bronchoscopy, such as those being blocked by a tumor. But this test has some drawbacks as well. For example, it doesn't show color changes in the airways that might indicate a problem. It also doesn't let a doctor take samples of suspicious areas like bronchoscopy does. Still, it may be a useful tool in some situations, such as in people who might be too sick to get a standard bronchoscopy.

This test will probably become more available as the technology improves.

Treatment

Real-time tumor imaging

Researchers are looking to use new imaging techniques, such as four-dimensional computed tomography (4DCT), to help improve treatment. In this technique, the CT machine scans the chest continuously for about 30 seconds. It shows where the tumor is in relation to other structures as a person breathes, as opposed to just giving a

'snapshot' of a point in time, like a standard CT does.

4DCT can be used to determine exactly where the tumor is during each part of the breathing cycle, which can help doctors deliver radiation to a tumor more precisely. This technique might also be used to help show if a tumor is attached to or invading important structures in the chest, which could help doctors determine if a patient might be eligible for surgery.

Radiation therapy

Several newer methods for giving radiation therapy[9] have become available in recent years, For example, some newer radiation therapy machines have imaging scanners built into them. This advance, known as *image guided radiation therapy* (IGRT), lets the doctor take pictures of the lung and make minor adjustments in aiming just before giving the radiation. This may help deliver the radiation more precisely, which might result in fewer side effects.

Chemotherapy

Clinical trials[10] are looking at newer chemotherapy drugs and combinations of drugs to determine which are the safest and most effective. This is especially important in patients who are older and have other health problems.

Doctors are also searching for better ways to combine chemotherapy with radiation therapy and other treatments.

Targeted therapy drugs

Researchers are learning more about the inner workings of lung cancer cells that control their growth and spread. This is being used to develop new targeted therapy drugs. These drugs work differently from standard chemotherapy drugs. They might work in some cases when standard chemo drugs don't, and they often have different (and less severe) side effects. Many of these treatments are being tested in clinical trials to see if they can help people with lung cancer live longer or relieve their symptoms.

Some of the targeted drugs now being studied include alisertib and linsitinib.

Immune treatments

Researchers are developing immunotherapy[11] drugs that can help the body's immune

system fight the cancer.

Immune checkpoint inhibitors: Cancer cells can sometimes avoid being attacked by the body's immune system by using certain "checkpoints" that normally keep the immune system in check. For example, cancer cells often have a lot of a protein called PD-L1 on their surface that helps them evade the immune system. Newer drugs that block the PD-L1 protein, or the corresponding PD-1 protein on immune cells called T cells, can help the immune system recognize the cancer cells and attack them.

Nivolumab (Opdivo) and **atezolizumab (Tecentriq)** are checkpoint inhibitors that can now be used to treat some people with advanced SCLC. In clinical trials, these drugs have been shown to shrink some small cell lung cancers and help some people live longer.

Several other checkpoint inhibitors are now being studied for use in SCLC as well.

Vaccines: Several types of vaccines for boosting the body's immune response against lung cancer cells are being tested in clinical trials. Unlike vaccines against infections like measles or mumps, these vaccines are designed to help treat, not prevent, lung cancer. These types of treatments seem to have very limited side effects, so they might be useful in people who can't tolerate other treatments. At this time, vaccines are only available in clinical trials.

Hyperlinks

1. www.cancer.org/cancer/small-cell-lung-cancer/causes-risks-prevention/prevention.html
2. www.cancer.org/cancer/small-cell-lung-cancer/detection-diagnosis-staging/detection.html
3. www.cancer.org/cancer/small-cell-lung-cancer/treating.html
4. www.cancer.org/healthy/stay-away-from-tobacco/guide-quitting-smoking.html
5. www.cancer.org/cancer/cancer-causes/radiation-exposure/radon.html
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10. www.cancer.org/treatment/treatments-and-side-effects/clinical-trials.html
11. www.cancer.org/cancer/small-cell-lung-cancer/treating/immunotherapy.html

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See all references for Small Cell Lung Cancer (www.cancer.org/cancer/small-cell-lung-cancer/references.html)

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