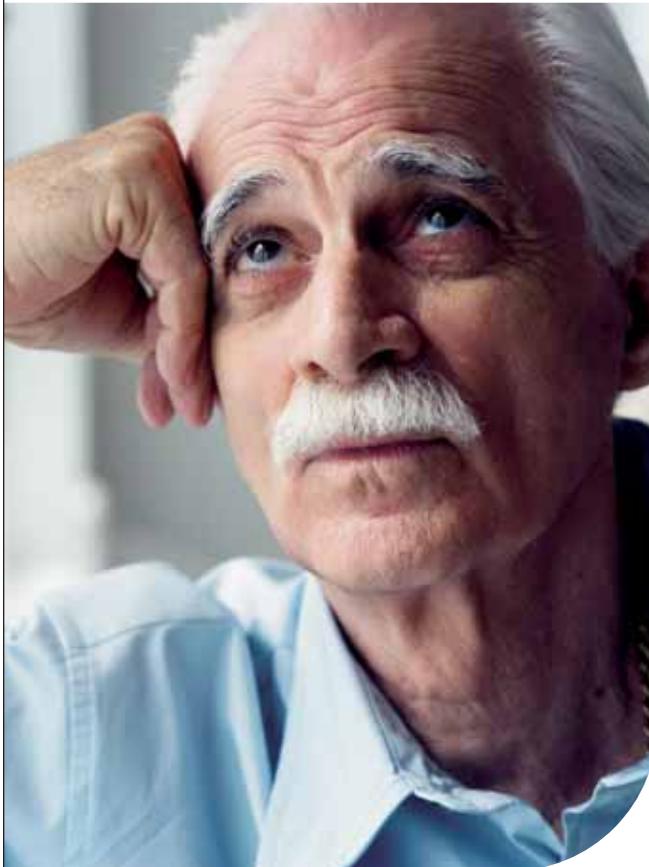




Canadian Cancer Society  
Société canadienne du cancer

# Lung Cancer

*Understanding your diagnosis*



Let's Make Cancer History

1 888 939-3333 | [cancer.ca](http://cancer.ca)

# Lung Cancer

## *Understanding your diagnosis*

When you first hear that you have cancer you may feel alone and afraid. You may be overwhelmed by the large amount of information you will have to take in and the decisions you will need to make.

The introductory information in this brochure can help you and your family take the first step in learning about lung cancer. A better understanding may give you a sense of control and help you work with your healthcare team to choose the best care for you.

## What is cancer?

Cancer is a disease that starts in our cells. Our bodies are made up of millions of cells, grouped together to form tissues and organs such as muscles and bones, the lungs and the liver. Genes inside each cell order it to grow, work, reproduce and die. Normally, our cells obey these orders and we remain healthy.

But sometimes the instructions in some cells get mixed up, causing them to behave abnormally. These cells grow and divide uncontrollably. After a while, groups of abnormal cells form lumps, or tumours.

Tumours can be either *benign* (non-cancerous) or *malignant* (cancerous). Benign tumour cells stay in one place in the body and are not usually life-threatening.

Malignant tumour cells are able to invade nearby tissues and spread to other parts of the body. Cancer cells that spread to other parts of the body are called *metastases*.

The first sign that a malignant tumour has spread (metastasized) is often swelling of nearby lymph nodes, but cancer can spread to almost any part of the body. It is important to find and treat malignant tumours as early as possible.

Cancers are named after the part of the body where they start. For example, cancer that starts in the lungs but spreads to the liver is called lung cancer with liver metastases.

## What is lung cancer?

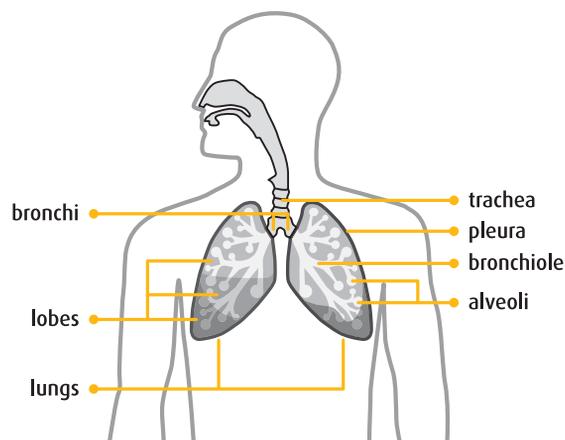
Lung cancer starts in the cells of the lung. The lungs are in the chest, one on each side of the heart. The right lung has three main parts, called *lobes*. The left lung is a bit smaller and has two lobes. The lungs are cushioned and protected by a thin covering called the *pleura*. The pleura has two layers of tissue: one layer covers the lungs and the other lines the inside wall of the chest. There is a small amount of fluid (*pleural fluid*) between the two layers of the pleura.

You use your lungs when you breathe. The air you take in through your nose or mouth flows down the *trachea* (windpipe). The trachea divides into two tubes called the left and right *bronchi*, which carry air to each lung. Once inside the lung, the bronchi divide into smaller and smaller tubes called *bronchioles*. Each bronchiole ends in a cluster of tiny air sacs called *alveoli*. The alveoli take oxygen from the air you breathe in and pass it into the blood for circulation to all parts of your body. The alveoli also remove carbon dioxide from the blood, which is pushed out of the lungs when you exhale.

There are two main types of lung cancer:

- *Non-small cell lung cancer* is the most common type of lung cancer. It grows more slowly than small cell lung cancer.
- *Small cell lung cancer* grows quickly and often spreads to distant parts of the body.

Because each type of lung cancer behaves quite differently, they are treated differently.



A rare type of cancer called *pleural mesothelioma* is often mistakenly called a lung cancer. But pleural mesothelioma starts in the lining of the lung and is very different from cancer that starts in the lung.\*

\* Pleural mesothelioma is not discussed in this brochure. For information about pleural mesothelioma, contact our *Cancer Information Service* at 1 888 939-3333.

## Causes of lung cancer

Smoking tobacco is the main cause of lung cancer. People who live or work with people who smoke are also at increased risk because they are exposed to second-hand smoke.

Other factors that increase the risk of lung cancer include:

- exposure to asbestos
- drinking water that contains high levels of arsenic
- exposure to radon gas
- exposure to some substances such as arsenic, chromium and nickel
- having had lung cancer before
- family history of lung cancer
- air pollution

Some of these risk factors – exposure to asbestos, arsenic and air pollution – are even greater if you're a smoker. Some people develop lung cancer without any of these risk factors.

## Symptoms of lung cancer

Lung cancer often doesn't cause any symptoms in its early stages. As the cancer grows, symptoms may include:

- a cough that gets worse or doesn't go away
- breathing problems, such as shortness of breath or wheezing
- constant chest pain, especially when you cough
- coughing up blood

- a hoarse voice
- frequent chest infections, such as pneumonia, or an infection that doesn't go away
- fatigue (feeling very tired all the time)
- unexplained weight loss
- loss of appetite

Other health problems can cause some of the same symptoms. Testing is needed to make a diagnosis.

## Diagnosing lung cancer

After taking your medical history and completing a physical examination, your doctor may suspect you have lung cancer. To confirm the diagnosis, your doctor will arrange special tests. These tests may also be used to “stage” the cancer. You may have one or more of the following tests.

**Imaging studies:** Imaging studies allow tissues, organs and bones to be looked at in more detail. Using x-rays, ultrasounds, CT scans or MRIs, your healthcare team can get a picture of the size of the tumour and see if it has spread. The pictures may also show abnormal fluid buildup or swollen lymph nodes. These tests are usually painless and do not require an anesthetic.

**Sputum cytology:** Samples of phlegm (called *sputum*) coughed up from the lungs are checked for cancer cells under a microscope.

**Biopsy:** A biopsy is usually necessary to make a definite diagnosis of cancer. Cells are removed from the body and checked under

a microscope. If the cells are cancerous, they may be studied further. There are many ways to do a biopsy.

- A *fine-needle aspiration* uses a thin needle to remove a small amount of fluid or cells from the lung or nearby lymph nodes. The doctor may use ultrasound or CT scan pictures to guide the needle to the suspicious area.
- *Thoracentesis* is done if pleural fluid has built up in the area between the lungs and the chest wall. You will be given a local anesthetic (freezing) to numb an area of the chest. The doctor inserts a long needle between the ribs and removes the fluid. The fluid is checked for cancer cells.
- *Bronchoscopy* uses a thin, flexible tube with a light at the end (called a *bronchoscope*) to look at the trachea and the large air passages in the lungs. The tube is inserted through the nose or throat and passed down to the lungs. You will be given a mild sedative and an anesthetic to numb your throat. If an abnormal area is found, the doctor can take samples of tissue through the bronchoscope. You may have a sore throat afterwards. This is normal and should disappear after a couple of days.
- A *mediastinoscopy* is done when it is necessary to check the tissues and lymph nodes around the trachea. The surgeon makes a small cut at the base of the neck and passes a thin, flexible tube through it

to take tissue samples. You will need a general anesthetic for this procedure.

- A *thoracoscopy* is done for tumours in the lung that may be beyond the reach of bronchoscopy, or that involve the pleura. A small cut is made through the chest wall and an instrument called a *thoracoscope* is inserted into the chest between two ribs. This procedure allows the doctor to look inside the chest cavity through the thoracoscope directly. Tissue samples can be taken through additional small cuts in the chest wall. You will need a general anesthetic for thoracoscopy.
- For a *thoracotomy*, the surgeon opens the chest with a long incision to look at the organs in the chest. Tissue samples and lymph nodes may be removed. You will need a general anesthetic for a thoracotomy. This operation is done only if other testing could not confirm a diagnosis.

**Blood tests:** Blood is taken and studied to see if the different types of blood cells are normal in number and appearance. Other blood tests can show how well your organs are working and may suggest whether or not you have cancer.

**Further testing:** If the initial diagnostic tests show that you have lung cancer, your doctor may order more imaging studies or other tests to find out if the cancer has spread.

## Staging

Once a definite diagnosis of cancer has been made and your healthcare team has the information it needs, the cancer will be given a stage.

The cancer stage describes the tumour size and tells whether it has spread beyond the place where it started to grow.

The staging is different for each type of lung cancer because they behave and grow differently.

### Staging for non-small cell lung cancer

| Stage            | Description  |
|------------------|--|
| Occult carcinoma | Cancer cells are found in the sputum coughed up from the lungs, but a tumour cannot be seen in the lung.   |
| 0                | Abnormal cells are found in the lining of the lung or of the air passages ( <i>trachea, bronchi</i> or <i>bronchioles</i> ). Abnormal cells have not spread to the tissues of the lung itself, but the cells may become cancerous and then spread. Stage 0 is also called carcinoma <i>in situ</i> .   |
| 1                | <b>Stage 1A:</b> The tumour is in the lung only and is less than 3 cm in size.<br><b>Stage 1B:</b> The tumour is larger than 3 cm or it is growing into the main airway of the lung ( <i>bronchus</i> ). It may also have spread to the covering of the lung ( <i>pleura</i> ) or made the lung partially collapse.  |
| 2                | <b>Stage 2A:</b> The tumour is less than 3 cm but has spread to nearby lymph nodes.<br><b>Stage 2B:</b> The tumour is larger than 3 cm and has spread to nearby lymph nodes.<br><b>OR</b> The tumour has grown into the chest wall, the pleura, the muscle layer below the lungs or the covering of the heart.<br><b>OR</b> The tumour has made the lung collapse. |

|   |  |
|---|--|
| 3 | <b>Stage 3A:</b> The tumour can be any size. Cancer cells have spread into the lymph nodes in the middle of the chest ( <i>mediastinum</i> ) but not to the other side of the chest.<br><b>OR</b> The cancer has spread to the tissue around the lung near where the cancer started, such as into the chest wall, the pleura, the middle of the chest or nearby lymph nodes.<br><b>Stage 3B:</b> There are 2 or more tumours in the same lung.<br><b>OR</b> Cancer cells have spread to lymph nodes on the other side of the chest or to nodes above either collarbone.<br><b>OR</b> The cancer has spread into another major structure, such as the esophagus, the heart, the trachea or a main blood vessel.<br><b>OR</b> Cancer cells are found in the pleural fluid (called <i>pleural effusion</i> ). |
| 4 | Cancer has spread to other parts of the body, such as the liver, brain or bones.   |

### Staging for small cell lung cancer

Because small cell lung cancer tends to grow and spread early on, there are only two stages.

| Stage           | Description   |
|-----------------|---|
| Limited stage   | Cancer cells are found only in one lung and in nearby lymph nodes. They may also be found in the pleural fluid. |
| Extensive stage | The cancer has spread outside the lung to the chest area or to other parts of the body.                         |

It is important to know the stage of the cancer. This information helps you and your healthcare team choose the best treatment for you.

## Treatments for lung cancer

Your healthcare team will consider your general health and the type and stage of the cancer to recommend what treatments will be best for you. You will work together with your healthcare team to make the final treatment choices. Talk to them if you have questions or concerns.

Treatments affect everyone in different ways. It's hard to predict which side effects you will have. Your healthcare team will tell you what to expect with each treatment. They will also let you know what side effects you should report right away and which ones you can wait to tell them about at your next appointment. If you notice any side effects or symptoms that you did not expect, talk to a member of your healthcare team as soon as possible.

Patients often worry about the side effects of cancer treatment. However, side effects can often be well managed and even prevented with medicine. Be open with your healthcare team. Tell them your concerns and ask questions. They will help you get the care and information you need.

For lung cancer, you might receive one or more of the following treatments.

**Surgery:** A decision to have surgery depends on the size of the tumour and where it is. During the operation, all or part of the tumour and some healthy tissue around the tumour are removed. Surgery is done under general anesthetic (you will be unconscious) and you will stay in the hospital for several days after the surgery.

Surgery is most commonly used for non-small cell lung cancers that are still small and have not spread. Surgery is not usually done for small cell lung cancer unless tumours are found at a very early stage, before the cancer has started to spread.

Surgery for non-small cell lung cancer can be done in several ways:

- **Wedge resection:** The surgeon removes the tumour and a small part of the lung.
- **Lobectomy:** The surgeon removes the lobe of the lung containing the tumour. This is the most common surgery for lung cancer.
- **Pneumonectomy:** The surgeon removes the entire lung. You will be able to breathe with your remaining lung.

It can take many weeks to recover fully from a lung operation. It is normal to have some pain or discomfort after your operation. Air and fluid may also collect in the chest. A tube will be inserted to drain the fluid. These side effects are temporary, and can be controlled. You will likely be given coughing and breathing exercises to do several times a day.

**Radiation therapy:** In *external beam radiation therapy*, a large machine is used to carefully aim a beam of radiation at the tumour. The radiation damages the cells in the path of the beam - normal cells as well as cancer cells. In *brachytherapy*, or internal radiation therapy, radioactive material is placed directly into or near the tumour.

Radiation side effects will be different depending on what part of the body receives the radiation. You may feel more tired than usual, have some diarrhea, or notice changes to the skin (it may be red or tender) where the treatment was given.

**Chemotherapy:** Chemotherapy may be given as pills or by injection. Chemotherapy drugs interfere with the ability of cancer cells to grow and spread, but they also damage healthy cells. Although healthy cells can recover over time, you may experience side effects from your treatment like nausea, vomiting, loss of appetite, fatigue, hair loss and an increased risk of infection.

**Targeted therapies:** Targeted therapies use drugs or other substances to block the growth and spread of cancer cells. These drugs are able to attack specific types of cancer cells. Targeted therapy is sometimes used to treat non-small cell lung cancer that has come back or that does not respond to chemotherapy. Side effects are generally mild. They may include diarrhea, a rash, dry or sore mouth, nausea and tiredness.

**Photodynamic therapy:** Photodynamic therapy uses a special drug that starts to work when exposed to light. The drug is injected into your bloodstream and absorbed by the cancer cells. When exposed to a high-energy laser light, the drug becomes active and destroys the cancer cells. Photodynamic therapy can be used to treat some cases of early-stage lung cancer. It can also be used to help relieve symptoms of a blocked airway.

**Clinical treatment trials:** Clinical treatment trials investigate new approaches to treating cancer, such as new drugs, new types of treatments or combinations of existing treatments. They are closely monitored to make sure that they are safe for the participants. Ask your doctor if there is a clinical trial suitable as a treatment option for you. You may benefit and so may future cancer patients.

**Complementary therapies:** Complementary therapies are used *together with* conventional treatments. More research is needed to understand if these therapies are effective and how they work.

Alternative therapies are used *instead of* conventional treatments. Alternative therapies haven't been tested for safety or effectiveness. It is still unknown whether they will harm you or be effective in the treatment of cancer.

If you are thinking about using a complementary or alternative therapy, it is important to find out as much as you can about the therapy and talk to your healthcare team. It's possible that the therapy might interfere with test results or regular treatments.

## After treatment

Follow-up care helps you and your healthcare team monitor your progress and your recovery from treatment. At first, your follow-up care may be managed by one of the specialists from your healthcare team. Later on it may be managed by your family doctor.

The schedule of follow-up visits is different for each person. You might see your doctor more often in the first year after treatment, and less often after that. After treatment has ended, you should report new symptoms and symptoms that don't go away, such as breathlessness or a new cough, to your doctor without waiting for your next scheduled appointment.

The end of cancer treatment may bring mixed emotions. You may be glad the treatments are over and look forward to returning to your normal activities. But you could feel anxious as well. If you are worried about your treatment ending, talk to your healthcare team. They are there to help you through this transition period.

## Living with cancer

There are many sources of help available for people with cancer and for their caregivers.

**Your healthcare team:** If you need practical help or emotional support, members of your healthcare team may be able to suggest services in your community or refer you to cancer centre staff or mental health professionals.

**Family and friends:** Those closest to you can be very supportive. Accept offers of help. When someone says "Let me know how I can help," tell them what they can do. Maybe they can run errands, cook a meal or give you a ride to your doctor's office.

**People who have had a similar experience:** Consider visiting a support group or talking with a cancer survivor in person, over the telephone or online. Talking with and learning from others who have had similar experiences can be helpful. Try more than one option to see which one suits you best.

**Yourself:** Try to stay positive. Staying positive is about figuring out how to deal with cancer in the best way that you can - and everyone will do this their own way. It doesn't mean that you must seem happy or cheerful all the time or avoid talking or thinking about the difficulties of having cancer. But it can mean looking after yourself by finding relaxing, enjoyable activities that refresh you mentally, spiritually or physically.

## The Canadian Cancer Society

*Helping you understand cancer*

Now that you have been introduced to the basics of lung cancer, you may want to learn more. Please contact the Canadian Cancer Society for more detailed information on lung cancer. Our services are free and confidential.

If you would like to talk to someone who has had a similar cancer experience, we can help you connect with a trained volunteer – in person, over the phone or in a group setting.

To contact the Canadian Cancer Society:

- Call an information specialist toll-free at **1 888 939-3333** Monday to Friday 9 a.m. to 6 p.m.
- E-mail us at **info@cis.cancer.ca**.
- Visit our website at **cancer.ca**.
- Contact your local Canadian Cancer Society office.



### We'd like to hear from you

E-mail us at [publicationsfeedback@cancer.ca](mailto:publicationsfeedback@cancer.ca) if you have comments or suggestions to help us make this booklet more useful for you and other readers.

## What we do

The Canadian Cancer Society fights cancer by:

- doing everything we can to prevent cancer
- funding research to outsmart cancer
- empowering, informing and supporting Canadians living with cancer
- advocating for public policies to improve the health of Canadians
- rallying Canadians to get involved in the fight against cancer

Contact us for up-to-date information about cancer, our services or to make a donation.



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TTY 1 866 786-3934

This is general information developed by the Canadian Cancer Society. It is not intended to replace the advice of a qualified healthcare provider.

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