Lung Cancer
Understanding your diagnosis
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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 have to take in and the decisions you need to make.

“All I could hear was ‘cancer.’ I heard my doctor say something like, ‘We’re going to try and get the surgery done as soon as possible.’ I didn’t hear one word after that.”

The introductory information in this brochure can help you and your family take the first steps 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.

For more information
The information in this brochure provides an introduction to lung cancer. More in-depth information is available on cancer.ca. You can also call our Cancer Information Service at 1-888-939-3333 to learn more about cancer, diagnosis, treatment, support and the services we offer.
What is cancer?

Cancer is a disease that starts in our cells. Our bodies are made up of trillions 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. It’s important to find and treat malignant tumours as early as possible. In most cases, finding cancer early increases the chances of successful treatment.

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.

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 3 main parts, called lobes. The left lung is smaller and has 2 lobes. The lungs are cushioned and protected by a thin covering called the pleura. The pleura has 2 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 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 2 tubes called the left and right bronchi – they carry air to each lung. Inside the lung, the bronchi divide into smaller and smaller tubes called bronchioles. Each bronchiole ends in a group of tiny air sacs called alveoli. The alveoli take oxygen from the air you breathe in and pass it into the blood. The blood circulates the oxygen 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 2 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 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.
Diagnosing lung cancer

Your doctor may suspect you have lung cancer after taking your medical history and doing a physical examination. To confirm the diagnosis, your doctor will arrange special tests. These tests may also be used to “stage” the cancer and to help plan treatment.

**Symptoms of lung cancer**: The most common signs and symptoms of lung cancer include:

- a cough that gets worse or doesn’t go away
- constant chest pain, especially when you cough or breathe deeply
- coughing up blood
- breathing problems, such as shortness of breath or wheezing
- frequent chest infections, such as pneumonia, or an infection that doesn’t go away
- fatigue (feeling very tired all the time)
- a hoarse voice
- loss of appetite
- unexplained weight loss

Other health problems can cause some of the same symptoms. The process of diagnosis may seem long and frustrating, but it is important for the doctor to make sure there are no other possible reasons for a health problem.

Your doctor will do one or more of the following tests to make a diagnosis.
**Imaging studies:** Imaging studies allow tissues, organs and bones to be looked at in more detail. Using x-rays, ultrasounds, CT and PET 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.

- 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 usually disappears 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 (you will be unconscious).

• 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 2 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 a thoracoscopy.

• Thoracocentesis 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.

• 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 area.
• 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 how they look. Other blood tests can show how well your organs are working and may suggest whether or not you have cancer.

**Further testing:** Your doctor may order more tests to find out if the cancer has spread and to help plan your treatment.

**Will I be okay?**

Most people with cancer want to know what to expect. Can they be cured?

A prognosis is your doctor’s best estimate of how cancer will affect you and how it will respond to treatment. A prognosis looks at many factors, including:

- the type, stage and grade of cancer
- the location of the tumour and whether it has spread
- your age, sex and overall health

Even with all this information, it can still be very hard for your doctor to say exactly what will happen. Each person’s situation is different.

Your doctor is the only person who can give a prognosis. Ask your doctor about the factors that affect your prognosis and what they mean for you.
**Staging**

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

The cancer stage describes the tumour size and whether it has spread.

Staging is different for each type of lung cancer because they behave and grow differently. It is important to know the stage of the cancer. This information helps you and your healthcare team choose the best treatment for you.

**Staging for non–small cell lung cancer***

For this type of lung cancer, there are 6 stages.

<table>
<thead>
<tr>
<th>Stage</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>Occult carcinoma</td>
<td>Cancer cells are found in the sputum coughed up from the lungs, but a tumour cannot be seen in the lung.</td>
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<tr>
<td>0</td>
<td>An early stage of cancer where abnormal cells are found in the lining of the lung or the lining of the air passages (trachea, bronchi or bronchioles). The cells have not spread to the tissues of the lung itself. Stage 0 is also called carcinoma in situ.</td>
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<tr>
<td>1</td>
<td>Tumours are less than 5 cm. Some tumours may have spread to the lining of the lung or to the main airway of the lung (bronchus). The tumour may cause inflammation in the lung or cause the lung to partially collapse.</td>
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*This table summarizes the stages of non–small cell lung cancer according to the Union for International Cancer Control (UICC) and the American Joint Committee on Cancer (AJCC) system. For more in-depth information, visit cancer.ca.*
Cancer cells are found only in one lung and in nearby lymph nodes. They may also be found in the pleural fluid.

The cancer has spread outside the lung to the chest area or to other parts of the body.

**Stage Description**

<table>
<thead>
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<th>Description</th>
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<tr>
<td>Limited stage</td>
<td>Cancer cells are found only in one lung and in nearby lymph nodes. They may also be found in the pleural fluid.</td>
</tr>
<tr>
<td>Extensive stage</td>
<td>The cancer has spread outside the lung to the chest area or to other parts of the body.</td>
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*This table summarizes the stages of small cell lung cancer according to the Veterans Administration Lung Cancer Study Group (VALCSG) system. For more in-depth information, visit cancer.ca.*

Staging for small cell lung cancer*

Because small cell lung cancer tends to grow and spread early in its development, there are only 2 stages.
Treatments for lung cancer

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

- For a wedge resection, the surgeon removes the tumour and a small part of the lung.
- For a lobectomy, the surgeon removes the lobe of the lung containing the tumour. This is the most common surgery for lung cancer.
- For a 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, lung problems, hair loss and an increased risk of infection.

For more information on treatment, you may want to read our booklets *Chemotherapy and Other Drug Therapies* and *Radiation Therapy.*
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 include diarrhea, an acne-like rash, a dry or sore mouth, nausea and tiredness.

Endobronchial therapy: Endobronchial therapies use different ways to remove or shrink a tumour that is blocking an airway or to treat non–small cell lung cancer that has not spread outside the bronchial wall. Endobronchial therapy may be used if you can’t have surgery or radiation therapy.

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.

Our booklet Clinical Trials has more information, including how to find a clinical trial.
Complementary therapies: Complementary therapies – for example, massage therapy or acupuncture – are used together with conventional cancer treatments, often to help ease tension and stress as well as other side effects of treatment. They don’t treat the cancer itself. 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 enough for safety or effectiveness. Using alternative treatments alone for cancer may have serious health effects.

If you’re thinking about using a complementary or alternative therapy, 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 other treatments.

Our booklet Complementary Therapies has more information.

Side effects of treatment: Some cancer treatments cause side effects, such as fatigue, hair loss or nausea. Because treatments affect everyone differently, it’s hard to predict which side effects – if any – you may have.

Side effects can often be well managed and even prevented. If you’re worried about side effects, tell your healthcare team about your concerns and ask questions. They can tell you which side effects you should report right away and which ones can wait until your next appointment.
If you notice any side effects or symptoms that you didn’t expect, talk to a member of your healthcare team as soon as possible. They’ll help you get the care and information you need.

**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 to your doctor without waiting for your next scheduled appointment.

**Self-image and sexuality:** It’s natural to be concerned about the effects of lung cancer and its treatment on your self-image. You may be worried about how your body looks during and after treatment, about having sex with a partner or that you may be rejected. It may help to talk about these feelings with someone you trust. Your doctor can also refer you to specialists and counsellors who can help you with the emotional side effects of lung cancer treatment.

Our booklet *Sexuality and Cancer* has more detailed information.
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 might feel anxious as well. If you’re worried about the end of your treatment, talk to your healthcare team. They’re there to help you through this transition period.

**Living with cancer**

Our booklet *Living with Cancer* has more detailed information and resources.

Many sources of help are 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:** People 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’ve had similar experiences:** Talking with and learning from others who’ve had similar experiences can be helpful. Consider visiting a support group or talking with a cancer survivor in person, over the telephone or online. Try more than one option to see which one works best for you.
**Yourself**: Coping well with cancer doesn’t mean that you have to be happy or cheerful all the time. But it can mean looking after yourself by finding relaxing, enjoyable activities that refresh you mentally, spiritually or physically. Take some time to find coping strategies to help you through this experience. You may also want to talk to a counsellor for more help.

**Talking to someone who’s been there**

If you would like to talk to someone who’s had a similar cancer experience, we can help. Let us connect you with a volunteer who can listen, provide hope, offer encouragement and share ideas for coping – all from the unique perspective of someone who’s “been there.”

To find out more about what’s available in your area, you can:
- Call us toll-free Monday to Friday at 1-888-939-3333 (TTY 1-866-786-3934).
- Email info@cis.cancer.ca.
- Visit cancer.ca.

**Want to connect with someone online?**

If you’d like to connect with someone online, join our online community, CancerConnection.ca. There are discussions and groups that may interest you, and you’ll find caring, supportive people there.
What causes lung cancer?

There is no single cause of lung cancer, but some factors increase the risk of developing it. Some people can develop lung cancer without any risk factors, while others who have these factors do not get it.

Risk factors for lung cancer include:
- smoking tobacco
- second-hand smoke
- exposure to radon
- exposure to asbestos
- being exposed at work to substances such as arsenic, chromium and nickel
- having had lung cancer before
- family history of lung cancer
- drinking water that contains high levels of arsenic
- previous lung disease
- exposure to radiation
- indoor burning of coal
- outdoor air pollution
- weakened immune system
- lupus

Some of these risk factors – exposure to asbestos, arsenic, air pollution and other chemicals – are even greater if you’re a smoker.
Canadian Cancer Society
We’re here for you.

When you have questions about treatment, diagnosis, care or services, we will help you find answers.

Call our toll-free number 1 888 939-3333.

Ask a trained cancer information specialist your questions about cancer. Call us or email info@cis.cancer.ca.

Connect with people online to join discussions, get support and help others. Visit CancerConnection.ca.

Browse Canada’s most trusted online source of information on all types of cancer. Visit cancer.ca.

Our services are free and confidential. Many are available in other languages through interpreters.

Tell us what you think
Email cancerinfo@cancer.ca and tell us how we can make this publication better.
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 and our services or to make a donation.