

# Understanding Lung Cancer

*A guide for people with cancer, their families and friends*



For information & support, call **13 11 20**

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*Understanding Lung Cancer* is reviewed approximately every two years.

Check the publication date above to ensure this copy is up to date.

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### Note to reader

Always consult your doctor about matters that affect your health. This booklet is intended as a general introduction to the topic and should not be seen as a substitute for medical, legal or financial advice. You should obtain independent advice relevant to your specific situation from appropriate professionals, and you may wish to discuss issues raised in this book with them. All care is taken to ensure that the information in this booklet is accurate at the time of publication. Please note that information on cancer, including the diagnosis, treatment and prevention of cancer, is constantly being updated and revised by medical professionals and the research community. Cancer Council Australia and its members exclude all liability for any injury, loss or damage incurred by use of or reliance on the information provided in this booklet.

### Cancer Council

Cancer Council is Australia's peak non-government cancer control organisation. Through the eight state and territory Cancer Councils, we provide a broad range of programs and services to help improve the quality of life of people living with cancer, their families and friends. Cancer Councils also invest heavily in research and prevention. To make a donation and help us beat cancer, visit [cancer.org.au](http://cancer.org.au) or call your local Cancer Council.



*Cancer Council acknowledges Traditional Custodians of Country throughout Australia and recognises the continuing connection to lands, waters and communities. We pay our respects to Aboriginal and Torres Strait Islander cultures and to Elders past, present and emerging.*



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# About this booklet

This booklet has been prepared to help you understand more about lung cancer.

Many people feel shocked and upset when told they have lung cancer. We hope this booklet will help you, your family and friends understand how lung cancer is diagnosed and treated. We also include information about support services.

We cannot give advice about the best treatment for you. You need to discuss this with your doctors. However, this information may answer some of your questions and help you think about what to ask your treatment team (see page 63 for a question checklist).

This booklet does not need to be read from cover to cover – just read the parts that are useful to you. Some medical terms that may be unfamiliar are explained in the glossary (see page 64). You may like to pass this booklet to family and friends for their information.

**How this booklet was developed** – This information was developed with help from a range of health professionals and people affected by lung cancer. It is based on Australian and international clinical practice guidelines for lung cancer.<sup>1-3</sup>



If you or your family have any questions or concerns, call **Cancer Council 13 11 20**. We can send you more information and connect you with support services in your area. You can also visit your local Cancer Council website (see back cover).



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## **Key to icons**

Icons are used throughout this booklet to indicate:

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More information



Alert



Personal story



Tips

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# What is cancer?

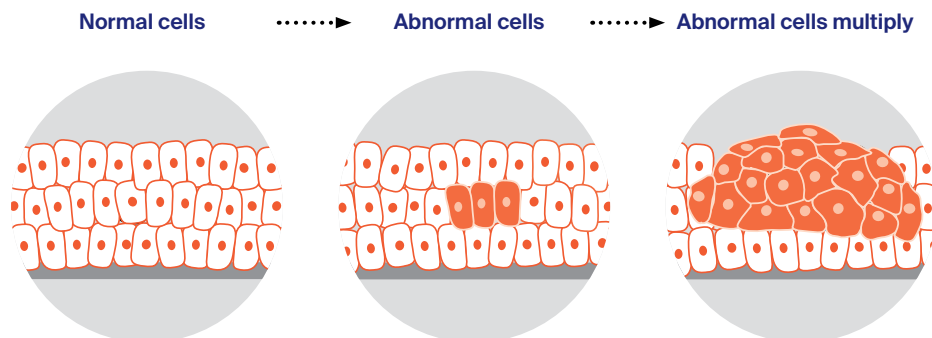
Cancer is a disease of the cells. Cells are the body's basic building blocks - they make up tissues and organs. The body constantly makes new cells to help us grow, replace worn-out tissue and heal injuries.

Normally, cells multiply and die in an orderly way, so that each new cell replaces one lost. Sometimes, however, cells become abnormal and keep growing. These abnormal cells may turn into cancer.

In solid cancers, such as lung cancer, the abnormal cells form a mass or lump called a tumour. In some cancers, such as leukaemia, the abnormal cells build up in the blood.

## How cancer starts

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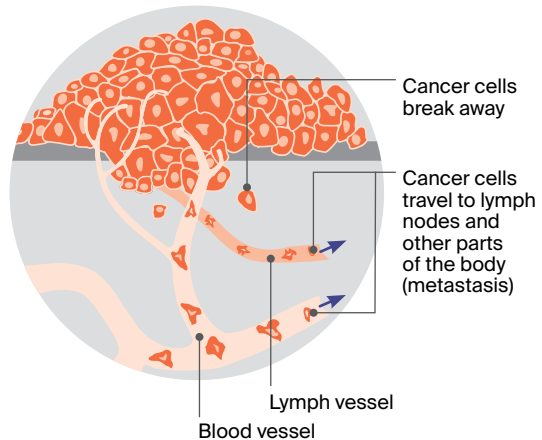
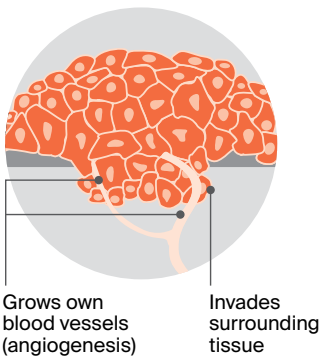


Not all tumours are cancer. Benign tumours tend to grow slowly and usually don't move into other parts of the body or turn into cancer. Cancerous tumours, also known as malignant tumours, have the potential to spread. They may invade nearby tissue, destroying normal cells. The cancer cells can break away and travel through the bloodstream or lymph vessels to other parts of the body.

The cancer that first develops is called the primary cancer. It is considered localised cancer if it has not spread to other parts of the body. If the primary cancer cells grow and form another tumour at a new site, it is called a secondary cancer or metastasis. A metastasis keeps the name of the original cancer. For example, lung cancer that has spread to the bones is called metastatic lung cancer, even though the main symptoms may be coming from the bones.

## How cancer spreads

### .....▶ Malignant cancer



# The lungs

The lungs are 2 sponge-like organs that are used for breathing. They are part of the respiratory system, which also includes the nose, mouth, trachea (windpipe) and airways (tubes) to each lung. There are large airways known as bronchi (singular: bronchus) and small airways called bronchioles. The lungs sit in the chest and are protected by the rib cage.

**Lobes** – Each lung is made up of sections called lobes – the left lung has 2 lobes, and the right lung has 3 lobes.

**Diaphragm** – The lungs rest on the diaphragm, which is a wide, thin muscle that helps with breathing, and separates the chest from the abdomen (belly).

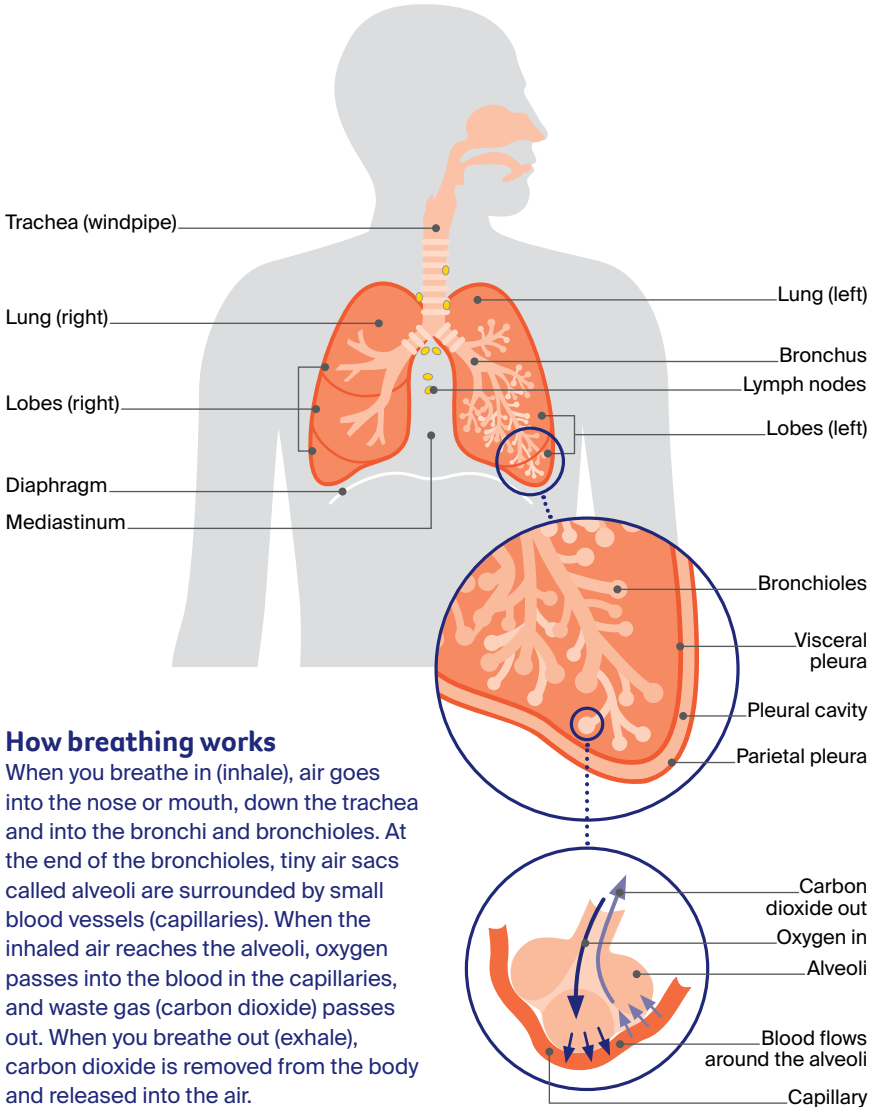
**Mediastinum** – The space between the lungs is called the mediastinum. A number of important structures lie in this space, including:

- the heart and large blood vessels
- the trachea – the tube that carries air into the lungs
- the oesophagus – the tube that carries food to the stomach
- lymph nodes – small, bean-shaped structures that collect and destroy bacteria and viruses.

**Pleura** – The lungs are covered by 2 thin layers of tissue called the pleura. The inner layer (visceral pleura) lines the lung surface, and the outer layer (parietal pleura) lines the chest wall, mediastinum and diaphragm. The layers are separated by a small amount of fluid that lets them smoothly slide over each other when you breathe. The pleural cavity is the potential space between the 2 layers; there is no space between the layers when the lungs are healthy.



# The respiratory system



## How breathing works

When you breathe in (inhale), air goes into the nose or mouth, down the trachea and into the bronchi and bronchioles. At the end of the bronchioles, tiny air sacs called alveoli are surrounded by small blood vessels (capillaries). When the inhaled air reaches the alveoli, oxygen passes into the blood in the capillaries, and waste gas (carbon dioxide) passes out. When you breathe out (exhale), carbon dioxide is removed from the body and released into the air.

# Key questions

## Q: What is lung cancer?

**A:** Lung cancer begins when abnormal cells grow and multiply in an uncontrolled way in the lungs. Cancer that starts in the lungs is called primary lung cancer. It can spread throughout the lungs, and to the lymph nodes, pleura, brain, adrenal glands, liver and bones. This booklet is about primary lung cancer only. When cancer starts in another part of the body and spreads to the lungs, it is named after the primary cancer (e.g. cancer that starts in the breast and spreads to the lungs is called metastatic breast cancer).

## Q: What are the different types?

**A:** There are 2 main types of primary lung cancer: non-small cell lung cancer and small cell lung cancer (see table below). Pleural mesothelioma is a type of cancer that affects the covering of the

### Types of lung cancer

<b>non-small cell lung cancer (NSCLC)</b>	NSCLC (about 85% of lung cancers) may be classified as: <ul style="list-style-type: none"><li>• <b>adenocarcinoma</b> – begins in mucus-producing cells; more often found in outer part of the lungs</li><li>• <b>squamous cell carcinoma</b> – begins in thin, flat cells; most often found in larger airways</li><li>• <b>large cell undifferentiated carcinoma</b> – the cancer cells are not clearly squamous or adenocarcinoma.</li></ul>
<b>small cell lung cancer (SCLC)</b>	SCLC (about 15% of lung cancers) tends to start in the middle of the lungs. This type of lung cancer usually spreads more quickly than NSCLC.

lung (the pleura). It is different from lung cancer and is usually caused by exposure to asbestos. Other types of cancer, like cancers that start in the chest wall, may also affect the lungs but are not considered lung cancer.

▶ See our *Understanding Mesothelioma* booklet.

## Q: What are the risk factors?

**A:** A risk factor is anything that is known to increase a person's chances of developing a certain condition, such as cancer. It's possible to avoid or reduce the impact of some risk factors. Called modifiable risk factors, these include smoking tobacco or exposure to air pollution. Other risk factors, such as having a family history of lung cancer, can't be avoided.

Not all causes of lung cancer are fully understood, and some people develop lung cancer without having any known risk factors. The factors listed below are known to increase the risk of lung cancer. Having these risk factors does not mean you will develop lung cancer, but if you are concerned, talk to your doctor.

### Lifestyle factors

**Tobacco smoking** – In Australia, about 85% of lung cancer cases in men and 70% in women are estimated to be a result of smoking tobacco. The earlier a person starts smoking, the longer they smoke and the more cigarettes they smoke, the higher the risk of developing lung cancer.

People who have never smoked can also get lung cancer. About 15% of cases occur in men who have never smoked, and about 30% of cases occur in women who have never smoked.<sup>4</sup>

## **Environmental or work-related factors**

**Second-hand smoking** – Breathing in other people’s tobacco smoke (second-hand smoke) can cause lung cancer. Living with someone who smokes is estimated to increase the risk of lung cancer by up to 30% in people who don’t smoke.

**Exposure to asbestos** – People who are exposed to asbestos are more likely to develop lung cancer or pleural mesothelioma (see pages 8–9). Although the use of asbestos in building materials has been banned in Australia since 2004, asbestos may still be found in some older buildings and fences.

**Exposure to other elements** – People who have been exposed to radioactive gas (radon), such as uranium miners, have an increased risk of lung cancer. Outdoor and indoor air pollution (e.g. exposure to household air pollution from gas or wood-burning cooking or heating) is another risk factor. Contact with the processing of arsenic, silica, cadmium, steel and nickel, and exposure to diesel engine exhaust while working may also be risk factors.

## **Personal factors**

**Family history** – You may be at slightly higher risk if a family member has been diagnosed with lung cancer.

**Other conditions** – Having another lung disease (e.g. lung fibrosis, chronic bronchitis, pulmonary tuberculosis, emphysema) or human immunodeficiency virus (HIV) may increase the risk of lung cancer.

**Older age** – Lung cancer is diagnosed mostly in people aged over 60 years, although it can occur in younger people.

## Q: How common is lung cancer?

**A:** About 14,500 Australians are diagnosed with lung cancer each year.<sup>5</sup> The average age at diagnosis is around 72 years. More men than women develop lung cancer, but since the early 1980s rates have been steadily decreasing among men and increasing among women.<sup>6</sup>

## Q: What are the symptoms?

**A:** The main symptoms of lung cancer are:

- a persistent new cough (lasting more than 3 weeks) or a change in a cough you've had for a long time
- breathlessness
- pain in the chest or shoulder
- chest infection that lasts more than 3 weeks or that keeps returning
- coughing or spitting up blood.

Lung cancer may also cause general symptoms such as wheezing, fatigue, weight loss, hoarse voice, difficulty swallowing, abdominal (tummy) pain, joint pain, neck or face swelling, and enlarged fingertips (finger clubbing).

Having any one of these symptoms does not necessarily mean that you have lung cancer; they may be caused by other conditions or from the side effects of smoking. Sometimes, there are no symptoms and the cancer is found during routine tests for other conditions. If you have symptoms, see your doctor without delay.



For an overview of what to expect at every stage of your cancer care, visit [cancer.org.au/cancercareguides/lung-cancer](https://cancer.org.au/cancercareguides/lung-cancer). This is a short guide to what is recommended, from diagnosis to treatment and beyond.

## Q: Which health professionals will I see?

**A:** Your general practitioner (GP) will arrange the first tests to assess your symptoms. If these tests do not rule out cancer, you will usually be referred to a specialist called a respiratory physician, who will arrange further tests. If lung cancer is

### Health professionals you may see

<b>GP</b>	assists you with treatment decisions and works in partnership with your specialists in providing ongoing care
<b>respiratory physician*</b>	diagnoses diseases of the lungs, including cancer, and recommends initial treatment options
<b>thoracic surgeon*</b>	diagnoses and performs surgery for cancer and other diseases of the lungs and chest (thorax)
<b>radiation oncologist*</b>	treats cancer by prescribing and overseeing a course of radiation therapy
<b>radiation therapist</b>	plans and delivers radiation therapy
<b>radiologist*, nuclear medicine specialist*</b>	analyses x-rays and scans; an interventional radiologist may also perform a biopsy under ultrasound or CT, and deliver some treatments; a nuclear medicine specialist coordinates the delivery of nuclear scans such as PET-CT
<b>medical oncologist*</b>	treats cancer with drug therapies such as chemotherapy, targeted therapy and immunotherapy (also known as systemic treatments)
<b>cancer care coordinator or lung cancer nurse coordinator</b>	coordinates your care, liaises with other members of the MDT, refers you to allied health professionals, provides education and information, and supports you and your family throughout treatment; care may also be coordinated by a clinical nurse consultant (CNC) or clinical nurse specialist (CNS)

diagnosed, the specialist will consider treatment options. Often these will be discussed with other health professionals at what is known as a multidisciplinary team (MDT) meeting. During and after treatment, you will see a range of health professionals who specialise in different aspects of your care.

<b>nurse</b>	administers drugs and provides care, information and support throughout treatment
<b>psychologist, counsellor</b>	help you manage your emotional response to diagnosis and treatment
<b>dietitian</b>	helps with nutrition concerns and recommends changes to diet during treatment and recovery
<b>speech pathologist</b>	helps with communication and swallowing after treatment
<b>social worker</b>	links you to support services and helps with emotional, practical and financial problems
<b>physiotherapist, occupational therapist</b>	assist with physical and practical problems, including improving fitness and breathing, restoring movement and mobility after treatment, and recommending aids and equipment
<b>exercise physiologist</b>	prescribes exercise to help people with medical conditions improve their overall health, fitness, strength and energy levels
<b>palliative care specialist* and nurses</b>	work closely with the GP and cancer team to help control symptoms and maintain your quality of life

*\* Specialist doctor*



# Diagnosis

Your doctors will arrange several tests to make a diagnosis and work out whether the cancer is in only the lung or has spread beyond the lung. The test results will help them recommend a treatment plan for you.

## Initial tests

The first test is usually a chest x-ray, which is often followed by a CT scan. You may also have a breathing test to check how your lungs are working and blood tests to check your overall health.

### Chest x-ray

A chest x-ray is painless and can show tumours 1 cm wide or larger. Small tumours may not show up on an x-ray or may be hidden by other organs within the chest cavity.

### CT scan

A CT (computerised tomography) scan uses x-ray beams to create detailed, cross-sectional pictures of the inside of your body. This scan can detect smaller tumours than those found by chest x-rays. It provides detailed information about the tumour, the lymph nodes in the chest and other organs.

CT scans are usually done at a hospital or radiology clinic. You may be asked to fast (not eat or drink) for several hours before having the scan.

Immediately before the scan, you will be given an injection of a liquid dye into a vein. This dye is known as contrast, and it makes the pictures clearer. The contrast may make you feel hot all over and leave a bitter





Before having scans, tell the doctor if you have any allergies or have had a reaction to contrast (dye) during previous scans. You should also let them know if you have diabetes or kidney disease, or are pregnant or breastfeeding.

taste in your mouth, and you may have nausea (feel sick) or feel a sudden urge to pass urine (pee or wee). These sensations should go away quickly, but tell your doctor if you continue to feel unwell.

The CT scanner is a large, doughnut-shaped machine. You will need to lie still on a table while the scanner moves around you. Getting ready for the scan can take 10–30 minutes, but the scan itself takes only a few minutes and is painless.

A low-dose CT scan may be useful for screening healthy people for lung cancer or to follow up suspicious-looking spots in the lungs. The Australian Government is considering introducing a lung cancer screening program.

## **Lung function test (spirometry)**

This test checks how well the lungs are working. It measures how much air the lungs can hold and how quickly the lungs can be filled with air and then emptied. For a lung function test, you will be asked to take a full breath in and then blow out into a machine called a spirometer. You may also have a lung function test before you have surgery (see pages 29–32) or radiation therapy (see pages 33–36).

## **Blood tests**

A sample of your blood will be tested to check the number of red blood cells, white blood cells and platelets (full blood count), and to see how well your kidneys and liver are working.

## Tests to confirm diagnosis

If a tumour is suspected after an x-ray or CT scan, you will need further tests to work out if it is lung cancer.

### PET-CT scan

This scan combines a PET (positron emission tomography) scan with a CT scan in one machine. As well as helping with diagnosis, a PET-CT scan can provide detailed information about any cancer that is found.

First, a small amount of radioactive glucose solution is injected into a vein, usually in your arm. You will be asked to sit quietly for 30-90 minutes while the glucose solution travels around your body. Then you will lie on a table that moves through the scanning machine very slowly. The scan will take about 30 minutes.

Cancer cells take up more of the glucose solution than normal cells do, so they show up more brightly on the scan.

Sometimes a PET-CT scan is done to work out if a biopsy is needed or to help guide the biopsy procedure. You will need to fast (not eat or drink) before having this scan.

### Biopsy

The most common way to confirm a lung cancer diagnosis is by biopsy. A small sample of tissue is taken from the lung, the nearby lymph nodes, or both. The tissue sample is sent to a laboratory, where

*“I had a PET scan and they could tell that the cancer was only in the right lung and one lymph node nearby.”* JUDY



A new test known as liquid biopsy involves taking a blood sample and examining it for cancer. Liquid biopsy is still being studied to see how accurate it is, and it is not a routine way to diagnose lung cancer.

a specialist doctor called a pathologist looks at the sample under a microscope. There are various ways to take a biopsy.

**CT-guided lung biopsy** – First, you will be given a local anaesthetic. Then, using a CT scan for guidance, the doctor inserts a needle through the chest wall to remove a small sample of tumour from the outer part of the lungs.

You will be monitored for a few hours afterwards. There is a small risk of damaging the lung, but this can be treated if it does occur.

**Bronchoscopy** – The doctor will look inside the large airways (bronchi) using a bronchoscope, a flexible tube with a light and camera.

A bronchoscopy is usually performed under light sedation, so you will be awake but feel relaxed and drowsy. You will also be given a local anaesthetic (a mouth spray or gargle) so you don't feel any pain during the procedure. The doctor will then pass the bronchoscope into your nose or mouth, down the trachea (windpipe) and into the bronchi.

If the tumour is near the bronchi, samples of cells can be collected using either a “washing” or “brushing” method. During “washing”, fluid is injected into the lung and then removed to be looked at under a microscope. “Brushing” uses a brush-like instrument to remove some cells from the bronchi. If possible, the doctor will use small forceps to take a tissue sample for biopsy.

*“I think the doctors knew I had cancer based on the shadow on my CT scan. But they didn’t tell me right away. I had to wait 2 weeks until I had a bronchoscopy and wash.”* JAMES

**Endobronchial ultrasound (EBUS)** – This is a type of bronchoscopy that allows the doctor to see a cancer deeper in the lung. During this test, the doctor may also take cell samples from a tumour, from the outer parts of the lung, or from lymph nodes in the area of your chest between your lungs (mediastinum). Samples from the lymph nodes can help to confirm whether or not they are also affected by cancer.

You will have light sedation and local anaesthetic, or a general anaesthetic. The doctor will then put a bronchoscope (a thin tube with a small ultrasound probe on the end) into your mouth. The bronchoscope will be passed down your throat until it reaches the bronchi.

The ultrasound probe uses soundwaves to create pictures that show the size and position of a tumour.

After a bronchoscopy, you may have a sore throat or cough up a small amount of blood. These side effects usually pass quickly but tell your medical team how you are feeling so they can monitor you.

**Endoscopic ultrasound** – Sometimes, an endoscopic ultrasound is used to check whether the lung cancer has spread to the lymph nodes in the mediastinum. In an endoscopic ultrasound, a probe is passed into your mouth and down your oesophagus and a cell sample is taken from the lymph nodes.

**Mediastinoscopy** – This type of biopsy is not used often but may be done if larger samples from the lymph nodes found in the area between the lungs (mediastinum) are needed. You will have a general anaesthetic, then the surgeon will make a small cut (incision) in the front of your neck and pass a thin tube down the outside of the trachea. You can usually go home on the same day as having a mediastinoscopy, but sometimes you may need to stay overnight in hospital.

**Thoracoscopy** – If other tests are unable to provide a diagnosis, you may have a thoracoscopy. This uses a thoracoscope – a tube with a light and camera – to take a tissue sample from the lungs. It is usually done under general anaesthetic with a type of keyhole surgery called video-assisted thoracoscopic surgery (VATS, see page 31). Sometimes a simpler procedure called a medical thoracoscopy can be done as a day procedure, because only light sedation is needed.

**Biopsy of neck lymph nodes** – The doctor may take a sample of cells from the lymph nodes in the neck with a thin needle. This is often done using ultrasound for guidance.

**Other biopsies** – If there is concern that the cancer may have spread to other organs, such as the brain, different types of biopsies may be done.

## **Other tests**

In some circumstances, such as if you aren't well enough for a biopsy, mucus or fluid from your lungs may be checked for abnormal cells.

**Sputum cytology** – In this test, a sample of mucus from your lungs (called sputum or phlegm) is examined to see if there are cancer cells. Sputum contains cells that line the airways, and is not the same as saliva.

To collect a sample for this test, you will be asked to cough deeply and forcefully into a container. You can do this at home in the morning before eating or drinking.

The sample can be kept in your fridge until you take it to your doctor, who will send it to a laboratory to check under a microscope.

**Pleural tap** – Also known as pleurocentesis or thoracentesis, this procedure drains fluid from around the lungs. A pleural tap can help to ease breathlessness (see pages 44–49), and the fluid can be tested for cancer cells.

It is mostly done with a local anaesthetic, with the doctor using ultrasound to guide the procedure.

## **Molecular tests**

Biopsy samples may be tested for gene changes or specific proteins in the cancer cells (biomarkers). These tests are known as molecular tests and they help work out which drugs may work best in treating the cancer.

**Gene changes** – Genes are found in every cell of the body and are inherited from both parents. If something triggers the genes to change (mutate), cancer may start growing.

A mutation that occurs after you are born (acquired mutation) is not the same thing as genes inherited from your parents. Most gene changes linked to lung cancer are not inherited.

In NSCLC, the most common genetic mutations are changes in the EGFR (epidermal growth factor receptor), ALK (anaplastic lymphoma

kinase), ROS1 (ROS proto-oncogene 1), and KRAS (Kirsten rat sarcoma virus) genes. Lung cancers with these gene mutations can be treated with a type of medicine called targeted therapy (see pages 39–40).

**Proteins** – If certain proteins are found in the biopsy sample from a NSCLC, the cancer may respond to immunotherapy (see pages 38–39). The most common protein tested for is called PD-L1 (programmed death ligand-1).

## Further tests

If the tests described in this chapter show that you have lung cancer, you will have further tests to see whether the cancer has spread beyond the lung to other parts of the body. You may also have a CT or MRI (magnetic resonance imaging) scan of the brain.

If a PET-CT scan is not available or the results are unclear, you may have a CT scan of the abdomen (belly) or a bone scan. For more information, talk to your doctor or call Cancer Council 13 11 20.

## Staging lung cancer

The test results will show what type of lung cancer you have and how far it has spread. Called staging, this helps your doctors recommend the best treatment for you.

Both NSCLC and SCLC are staged using a system that considers the size of the tumour, whether it has affected lymph nodes and whether it has spread. This is called the tumour–nodes–metastasis (TNM) system. Sometimes, SCLC is staged using a different system. For more information about these 2 staging systems, see the tables on the next page.

## TNM staging system

TNM stands for tumour–nodes–metastasis. Each letter is given a number (and sometimes another letter) to show how advanced the cancer is. This information may be combined to give the lung cancer an overall stage of 1, 2, 3 or 4.

<b>T (tumour)</b>	Indicates the size of the tumour and how far the tumour has grown into the lung; ranges from T1a (tumour is 1 cm or less) to T4 (tumour is more than 7 cm, or has grown into nearby vital structures, or there are two or more separate tumours in the same lung).
<b>N (nodes)</b>	Shows if the tumour has spread to nearby lymph nodes; ranges from N0 (no spread) to N3 (cancer in lymph nodes on the opposite side of the chest, above the collarbone or at the top of the lung).
<b>M (metastasis)</b>	Shows if the tumour has spread to other parts of the body; ranges from M0 (no spread to distant parts of the body) to M1c (cancer has spread and formed more than one tumour in distant parts of the body, e.g. liver, bone).

## Staging SCLC

Sometimes, SCLC is staged using a 2-stage system in which the cancer is classified as either limited stage or extensive stage.

<b>limited stage</b>	Cancer is only on one side of the chest and in one part of the lung; nearby lymph nodes may also be affected.
<b>extensive stage</b>	Cancer has spread widely through the lung, to the other lung, to lymph nodes on the other side of the chest or to other areas in the body.



## Prognosis

Prognosis means the expected outcome of a disease. You may wish to discuss your prognosis and treatment options with your doctor, but it is not possible for anyone to predict the exact course of the disease. Instead, your doctor can give you a general idea of the outlook for people with the same type and stage of lung cancer.

To work out your prognosis, your doctor will consider:

- your test results
- the type and stage of lung cancer
- the rate and extent of tumour growth
- other factors such as your age, fitness and overall health, and whether you smoke.

Discussing your prognosis and thinking about the future can be challenging and stressful. It is important to know that although the statistics for lung cancer can be frightening, they are an average and may not apply to your situation. Talk to your doctor about how to interpret any statistics that you come across.

As in most types of cancer, the results of lung cancer treatment tend to be better when the cancer is found and treated early. Newer treatments such as targeted therapy and immunotherapy are having good results in some people with advanced lung cancer and are bringing hope to those who have lung cancer that has spread.

In the future, these therapies may also be used in earlier stage cancer. See pages 38–40 for more information about these treatments.

## Key points about diagnosing lung cancer

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### Diagnostic tests

The tests to diagnose lung cancer may include:

- chest x-ray
- CT scan of the lungs, lymph nodes, and other organs
- lung function and blood tests
- PET-CT scan
- biopsy – tests a tissue sample removed from your chest by CT-guided lung biopsy, bronchoscopy, endobronchial ultrasound (EBUS), endoscopic ultrasound, mediastinoscopy or thoracoscopy
- sputum cytology – tests a sample of mucus from the lungs
- pleural tap (pleurocentesis or thoracentesis) – tests a sample of fluid drained from the lungs.

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### Molecular and further tests

Other tests may be used to provide more information about the cancer, help work out if it has spread, and guide treatment. These may include:

- molecular tests – test the biopsy sample to identify genes or proteins in the cancer cells
- CT, MRI or bone scans

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### Staging and prognosis

- The specialist will tell you the stage of the cancer, which describes how much cancer there is and whether it has spread.
- You may also wish to discuss the prognosis, which is the expected outcome for people with the same type and stage of cancer as you.

# Making treatment decisions

Sometimes it is difficult to decide on the type of treatment to have. You may feel that everything is happening too fast, or you might be anxious to get started.

Check with your specialist how soon treatment should begin, as it may not affect the success of the treatment to wait a short time. Ask them to explain the options, and take as much time as you before making a decision.

**Know your options** – Understanding the disease, the available treatments, possible side effects and any extra costs can help you weigh up the options and make a well-informed decision. Check if the specialist is part of a multidisciplinary team (see page 13) and if the treatment centre is the most appropriate one for you – you may be able to have treatment closer to home, or it might be worth travelling to a centre that specialises in a particular treatment.

**Record the details** – When your doctor first says you have cancer, you may not remember everything you are told. Taking notes can help. If you would like to record the discussion, ask your doctor first. It is a good idea to have a family member or friend go with you to appointments to join in the discussion, write notes or simply listen.

**Ask questions** – If you are confused or want to check anything, it is important to ask your specialist questions. Try to prepare a list before appointments (see page 63 for suggestions). If you have a lot of questions, you could talk to a cancer care coordinator or nurse.

**Consider a second opinion** – You may want to get a second opinion from another specialist to confirm or clarify your specialist's recommendations or reassure you that you have explored all of your options. Specialists are used to people doing this. Your GP or specialist can refer you to another specialist and send your initial results to that person. You can get a second opinion even if you have started treatment or still want to be treated by your first doctor. You might decide you would prefer to be treated by the second specialist.

**It's your decision** – Adults have the right to accept or refuse any treatment that they are offered. For example, some people with advanced cancer choose treatment that has significant side effects even if it gives only a small benefit for a short period of time. Others decide to focus their treatment on quality of life. You may want to discuss your decision with the treatment team, GP, family and friends.

► See our *Cancer Care and Your Rights* booklet.

## Should I join a clinical trial?

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Your doctor or nurse may suggest you take part in a clinical trial. Doctors run clinical trials to test new or modified treatments and ways of diagnosing disease to see if they are better than current methods. For example, if you join a randomised trial for a new treatment, you will be chosen at random to receive either the best existing treatment or the modified new treatment. Over the years, trials have improved treatments and

led to better outcomes for people diagnosed with cancer.

You may find it helpful to talk to your specialist, clinical trials nurse or GP, or to get a second opinion. If you decide to take part in a clinical trial, you can withdraw at any time. For more information, visit [australiancancertrials.gov.au](http://australiancancertrials.gov.au).

► See our *Understanding Clinical Trials and Research* booklet.

# Treatment

Treatment for lung cancer will depend on the type of lung cancer you have, the stage of the cancer, how well you can breathe (your lung function) and your general health.

If you smoke, your doctor will offer to help you to stop smoking before you start treatment (see page 29).

## Understanding the aim of treatment

For early or locally advanced non-small cell lung cancer (stages 1-3 NSCLC) or limited-stage small cell lung cancer (stage 1-3 SCLC), treatment may be given with the aim of making all signs and symptoms of the cancer go away. This is called curative intent treatment.

Because lung cancer causes vague symptoms in the early stages, many people are diagnosed when the cancer is advanced (stage 4 NSCLC, or extensive stage or stage 4 SCLC). This means the cancer has spread outside the lung to other parts of the body.

When cancer is advanced, the goal of treatment is often to maintain quality of life by controlling the cancer, slowing down its spread and managing any symptoms. This is called palliative treatment. Sometimes palliative treatment can stabilise the cancer, enabling people to enjoy a good quality of life for many months or even years.

NSCLC and SCLC are treated in different ways (see next page). Treatments to improve breathing are covered in the *Managing symptoms* chapter on pages 44-49.

## Treatment options by cancer type and stage

### Non-small cell lung cancer (NSCLC)

#### early (stage 1 or 2)

Usually treated with surgery to remove the cancer and nearby lymph nodes. If you are unable to have surgery or you choose not to have it, you may have radiation therapy, including a type of high-dose targeted radiation therapy called stereotactic body radiation therapy (SBRT). Sometimes, chemotherapy may be given after surgery to reduce the risk of the cancer returning.

#### locally advanced (stage 3)

Can be treated with surgery and chemotherapy or with radiation therapy and chemotherapy. Immunotherapy drugs may also be used. Treatment will depend on where the cancer is in the lung and the number and location of lymph nodes with cancer. In some cases, targeted therapy may be used to slow the spread of the cancer.

#### advanced (stage 4)

Depending on the symptoms, palliative drug treatment (targeted therapy, immunotherapy or chemotherapy), palliative radiation therapy, SBRT, or a combination of treatments may be used. This depends on the cancer cell type and molecular test results.

### Small cell lung cancer (SCLC)

#### limited stage (stage 1–3)

Usually treated with chemotherapy and radiation therapy over the same time period (called chemoradiation). Sometimes, surgery may be used for stage 1 disease.

#### extensive stage (stage 4)

Mainly treated with palliative chemotherapy, with or without immunotherapy. Palliative radiation therapy may also be given to the primary cancer in the lung and to other parts of the body where the cancer has spread.

## Surgery

People with early NSCLC (stage 1 or 2) will generally be offered surgery to remove the tumour. How much of the lung is removed (see next page) depends on several factors:

- the location and size of the cancer
- your general wellbeing and fitness
- how your lungs are working (lung function).

Surgery is not suitable for most people with late-stage lung cancer.

If there is fluid in the pleural cavity (called pleural effusion) that keeps coming back, you may have minor surgery (pleurodesis) to control this. See pages 46–47 for more information on this procedure.

## Preparing for treatment

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### Quit smoking

If you smoke, your health care team will usually advise you to stop smoking before you start treatment for lung cancer.

Quitting smoking can improve how treatments work and reduce the impact of side effects such as breathlessness. Research shows that quitting smoking before surgery also reduces the chance of complications.

To work out a plan for quitting, talk to your doctor or call Quitline on 13 78 48 (13 QUIT).

### Eat well and exercise

Your health care team may also suggest that you exercise and eat healthy foods before starting lung cancer treatment.

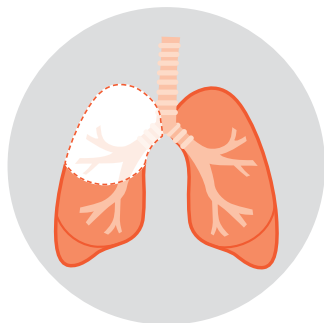
You may be referred to allied health professionals such as a dietitian or exercise physiologist to support you to make changes.

Preparing for treatment in this way is called “prehabilitation”. It can help you to cope with cancer treatment, recover more quickly and improve your quality of life.

## Types of lung surgery

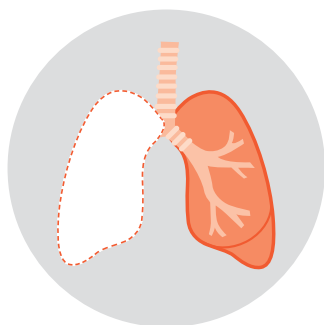


Surgery for lung cancer may remove all or part of a lung.



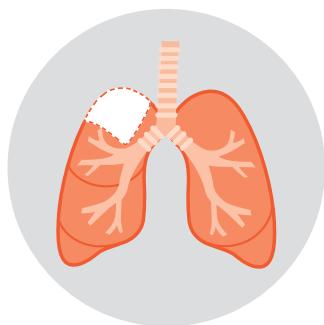
### Lobectomy

This is the most common type of surgery for lung cancer. In a lobectomy, one of the lobes of the lung is removed. About 30–50% of the lung will be removed.



### Pneumonectomy

If the cancer is in more than one lobe of a lung, or near where the airways enter the lung, a pneumonectomy may be done. In this procedure, a whole lung is removed. It's possible to still breathe normally with one lung.



### Segmentectomy

For some early-stage lung cancers that are on the edge of the lung, a segmentectomy may be used. In this procedure, a small part of the lobe is removed. In cases where a patient is very unwell, however, a wedge resection may be considered. A wedge resection removes only a very small amount of the lobe.



## Removing lymph nodes

During surgery, lymph nodes near the cancer will also be removed to check whether the cancer has spread. Knowing if the cancer has spread to the lymph nodes also helps the doctors decide whether you need further treatment with chemotherapy or radiation therapy.

## How the surgery is done

There are 2 ways to perform surgery for lung cancer, and both require a general anaesthetic. Each type of surgery has advantages in particular situations – talk to your surgeon about the best option for you.

**VATS** – Lung cancer surgery can often be done using a keyhole approach. This is known as video-assisted thoracoscopic surgery (VATS). In this approach, the surgeon makes a few small cuts (incisions) in the chest wall.

A tiny video camera and operating instruments are passed through the cuts, and the surgeon performs the operation from outside the chest. A keyhole approach usually means a shorter hospital stay, faster recovery and fewer side effects.

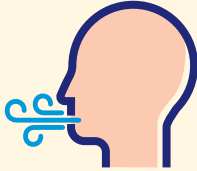
**Thoracotomy** – If a long cut is made between the ribs in the side of the chest, the operation is called a thoracotomy. This may also be called open surgery. You will need to stay in hospital for 3–7 days.



Most hospitals in Australia have programs to reduce the stress of surgery and improve your recovery. Called enhanced recovery after surgery (ERAS) or fast track surgical (FTS) programs, they provide information about what to expect each day after surgery. For information about preparing for treatment, see page 29.

## What to expect after surgery

### Exercises for breathlessness



A pulmonary rehabilitation program can help improve breathlessness and reduce the risk of chest infection. A physiotherapist will show you how to do exercises. To continue rehabilitation after you leave hospital, talk to your surgeon or visit [lungfoundation.com.au](http://lungfoundation.com.au). For simple strategies to ease breathlessness at home, see pages 48–49.

### Recovery time

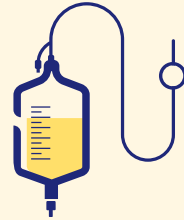


You will probably go home after 3–7 days. It may take 4–8 weeks after VATS or 6–12 weeks after thoracotomy to get back to your usual activities. Walking can improve fitness, help clear your lungs and speed up recovery.

### Pain

You may have some pain but this can be controlled. Managing the pain will allow you to do breathing exercises and help you to recover. Pain will improve when tubes are removed from the chest.

### Tubes and drips



You will have several tubes in place, which will be removed as you recover. A drip in a vein in your arm (intravenous drip) will give you fluid and medicines. There may be tubes in your chest to drain fluid and help your lungs expand; and a tube in your bladder to check how much urine you pass.

- ▶ See our *Understanding Surgery* booklet for more information about surgery and recovery.

## Radiation therapy

Also known as radiotherapy, radiation therapy is the use of a controlled dose of radiation to kill or damage cancer cells so they cannot grow, multiply or spread.

Radiation therapy may be given on its own, after surgery or with chemotherapy (called chemoradiation). It may be recommended:

- if you are unable or choose not to have surgery
- to treat locally advanced (stage 3) NSCLC or limited-stage SCLC
- after surgery, if there is some cancer left behind (called a positive margin)
- after surgery, if tests show cancer in the lymph nodes between the lungs, to reduce the risk of cancer coming back in this area
- as palliative treatment to improve quality of life by relieving pain or other symptoms (see page 41).

For lung cancer, the radiation is usually in the form of x-ray beams that come from a machine outside the body. This is called external beam radiation therapy (EBRT). It can be delivered in different ways depending on the type and stage of lung cancer.

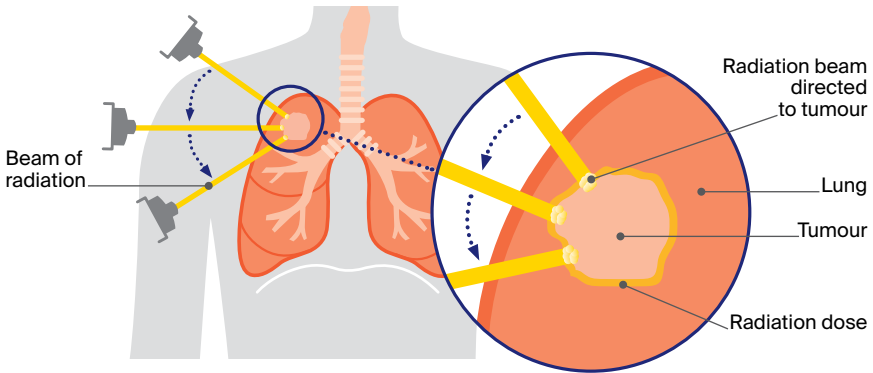
**Standard EBRT** – This is usually given Monday to Friday over several weeks. For NSCLC, treatment aimed at making the signs and symptoms of cancer go away (curative course) may involve 20–30 radiation therapy sessions over 4–6 weeks. Palliative radiation therapy may involve up to about 10 treatments. For SCLC, treatment may be given twice a day for 3 weeks (about 30 treatments).

**Stereotactic body radiation therapy (SBRT)** – This is also called stereotactic ablative body radiation (SABR). It is a way of giving a very precise high dose of radiation therapy to small, early-stage NSCLC.

## How SBRT is done

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Stereotactic body radiation therapy (SBRT) precisely targets beams of high-dose radiation from different angles onto the tumour.



SBRT may be used when you are not well enough to have surgery, or surgery is not possible due to the location or size of the cancer. SBRT is often given as 3–4 treatment sessions over a couple of weeks. It is suitable only for tumours that are not close to major airways or major blood vessels.

## Planning radiation therapy

Before treatment starts, you will have a planning session at the radiation therapy centre to design a treatment plan for you. During this appointment, you will have a CT scan to pinpoint the area to be treated, and marks will be put on your skin so the radiation therapist treats the same area each time. Often, you will have a 4-dimensional CT scan to monitor how the lung cancer moves as you breathe in and out. You may also be given some breathing exercises to help your breathing stay as regular as possible during the treatment sessions.

## Having radiation therapy

Radiation therapy is delivered using a large machine called a linear accelerator. Each treatment day, a radiation therapist will help you to lie on the treatment table and make sure you are in the correct position before leaving the room. Before the radiation therapy is given, you will have an x-ray or CT scan to make sure the correct area is being treated. The radiation treatment itself takes only a few minutes, but a session may last 10–20 minutes because of the time it takes to set up the machine.

## Side effects of radiation therapy

Radiation therapy itself is painless, but the radiation may affect some tissues of the body and cause various side effects. These side effects vary depending on the dose of radiation, the number of treatments and the part of the chest treated. Most are temporary and disappear a few weeks or months after treatment.

**Discomfort when swallowing and heartburn** – If the cancer is in the centre of the chest and near the oesophagus, you may have some discomfort when swallowing, and heartburn during the treatment period and up to 4 weeks after treatment ends. Until these side effects improve, you may need to eat soft foods and avoid hot drinks.

**Fatigue** – Feeling tired is common after radiation therapy. Plan your daily activities so you can rest regularly. You may find that gentle physical exercise reduces fatigue (see page 52).

**Skin changes** – The skin on your chest and back may become red or dry, like sunburn. It is important to avoid getting direct sunlight on these areas. Applying a moisturising cream daily can help protect your skin – talk to your medical team about which products they recommend.

**Shortness of breath and cough** – Radiation therapy may cause inflammation of the lungs. Called radiation pneumonitis, this may cause shortness of breath and/or a cough. This may happen during treatment, but it is more likely to appear 1–6 months after treatment ends. Radiation pneumonitis is usually temporary and can be treated.

Side effects can change from one treatment session to the next and may build up over time. Tell the radiation oncology team about any side effects you have, as most can be managed.

▶ See our *Understanding Radiation Therapy* booklet.

## Drug therapies

Sometimes called systemic therapies, drug therapies can travel throughout the body to treat cancer cells wherever they may be. This can be helpful for cancer that has spread (metastatic cancer). The main types of drug therapies used to treat lung cancer are chemotherapy, immunotherapy and targeted therapy.

### Chemotherapy

Chemotherapy is the use of drugs to kill cancer cells or slow their growth. Chemotherapy can be used at different times:

- before surgery to try to shrink the cancer and make it easier to remove (neoadjuvant chemotherapy)
- before or in combination with radiation therapy to make radiation therapy more effective (chemoradiation), or in combination with immunotherapy
- after surgery to reduce the risk of the cancer returning (adjuvant chemotherapy)
- when cancer is advanced – to reduce symptoms and improve quality of life (palliative chemotherapy, see page 41).

## Having chemotherapy

Chemotherapy is usually given through a vein (intravenously). It is commonly given as a period of treatment followed by a break to allow your body to recover. This is called a cycle. The number of cycles will depend on the type of lung cancer and any side effects you have. You will probably have chemotherapy as an outpatient, which means you will go to the treatment centre for chemotherapy but not stay overnight. Some types of chemotherapy come in tablet form and can be taken by mouth (orally) at home. Ask your doctor about the treatment plan recommended for you.

## Side effects of chemotherapy

Chemotherapy works on cells that are dividing rapidly. Cancer cells divide rapidly, as do some healthy cells such as the cells in your blood, mouth, digestive system and hair follicles. Side effects occur when chemotherapy damages these normal cells. As the body constantly makes new cells, most side effects are temporary. Some side effects are listed below.

**Anaemia** – A low red blood cell count is called anaemia. This can make you feel tired, breathless or dizzy. Your treatment team will monitor your red blood cell levels and suggest treatment if necessary.

**Risk of infections** – Chemotherapy drugs can lower the number of white blood cells that fight infections caused by bacteria. If you get an infection caused by a virus, such as a cold, flu or COVID-19, the risk of getting a bacterial infection is further increased. Talk to your doctor about being vaccinated against flu and COVID-19. Good hand and mouth hygiene and social distancing are also important measures to reduce the risk of infection. If you feel unwell or have a temperature above 38°C, call your doctor immediately or go to the hospital emergency department.

**Mouth ulcers** – Some chemotherapy drugs cause mouth sores, ulcers and thickened saliva, which make it difficult to swallow. Your treatment team will explain how to take care of your mouth.

**Hair loss** – You may lose hair from your head and chest, depending on the chemotherapy drugs you receive. The hair will grow back after treatment is completed, but the colour and texture may change.

**Nausea, vomiting or constipation** – You will usually be prescribed anti-nausea medicine with your chemotherapy drugs, but some people still feel sick (nauseous) or vomit. Constipation is also a common side effect of some types of anti-nausea medicines. Let your treatment team know if you have these side effects, as they may be able to give you additional medicines.

- ▶ See our *Understanding Chemotherapy* booklet, *Mouth Health and Cancer Treatment* and *Hair Loss* fact sheets, and listen to our “Appetite Loss and Nausea” podcast episode.

## Immunotherapy

This is a type of drug treatment that uses the body’s own immune system to fight cancer. Immunotherapy drugs known as checkpoint inhibitors block proteins, such as PD-L1, that stop immune cells from recognising and destroying the cancer cells. Once the proteins are blocked, the immune cells can potentially recognise and attack the lung cancer.

Several checkpoint inhibitors have been approved for most types of advanced NSCLC. One has also been approved for extensive-stage SCLC when it is used together with chemotherapy. Several other checkpoint inhibitors are being tested in clinical trials for lung cancer, including using a combination of these drugs.



Immunotherapy may be used alone or with chemotherapy as a palliative treatment, or after chemoradiation. In the future, immunotherapy may be used for early-stage NSCLC, either before or after surgery.

Checkpoint inhibitors do not work for all types of lung cancer, but some people have had good results. Ask your oncologist about molecular testing (see page 20) and whether immunotherapy may be an option for you.

### **Side effects of immunotherapy**

Immunotherapy can cause inflammation throughout the body, which leads to different side effects depending on which part of the body becomes inflamed.

Common side effects include fatigue, rash, painful joints and diarrhoea. Most people have mild side effects that can be treated easily and usually improve.

Let your treatment team know if you have new or worsening symptoms. If left untreated, some side effects can become serious and may even be life-threatening. For a detailed list of side effects, visit [eviq.org.au](http://eviq.org.au).

▶ See our *Understanding Immunotherapy* fact sheet.

### **Targeted therapy**

This is a type of drug treatment that attacks specific features of cancer cells, known as molecular targets, to stop the cancer growing and spreading. The molecular targets are usually particular gene changes that are found in or on the surface of cancer cells.

Targeted therapy is currently available for people with NSCLC whose tumours have specific gene changes (see pages 20–21) when

the cancer is advanced or has come back after initial surgery or radiation therapy. These drugs will only work if the cancer contains the particular gene targeted and, even then, they do not work for everyone. Ask your oncologist about molecular testing (see pages 20–21) and whether targeted therapy is an option for you.

Targeted therapy can often be given by mouth as tablets or capsules.

This area of cancer treatment is changing rapidly, and it's likely that new gene changes and targeted therapy drugs will continue to be discovered. Talk to your oncologist about any clinical trials that may be suitable for you (see page 26).

Cancer cells often become resistant to targeted therapy drugs over time. If the first-line treatment stops working, your oncologist may suggest trying another targeted therapy drug or another systemic treatment. This is known as second-line treatment.

### **Side effects of targeted therapy**

Although targeted therapy may cause less harm to healthy cells than chemotherapy, it can still have side effects. These side effects vary depending on the type of targeted therapy drugs used. Common side effects that may develop include an acne-like rash, fatigue, diarrhoea, nausea or vomiting.

Targeted therapies may also cause pneumonitis (inflammation of the lung tissue), which can lead to breathing problems. It's important to report any new or worsening side effects to your treatment team. If left untreated, some side effects can become serious and may even be life-threatening. For a detailed list of side effects, visit [eviq.org.au](http://eviq.org.au).

► See our *Understanding Targeted Therapy* fact sheet.

## Palliative treatment

If the cancer is advanced when it is first diagnosed or comes back after treatment (recurrence), your doctor will discuss palliative treatment for any symptoms caused by the cancer. They may refer you to a palliative care specialist.

Palliative treatment aims to manage symptoms without trying to cure the disease. It can be used at any stage of advanced lung cancer to improve quality of life and does not mean giving up hope. In fact, palliative treatment can help some people with advanced lung cancer to live fulfilling lives with minimal symptoms for many months or even years.

Systemic treatment (chemotherapy, immunotherapy and targeted therapy), radiation therapy and surgery may be used palliatively to slow the spread of cancer and control symptoms such as pain or breathlessness. If you are experiencing a build-up of fluid in the lungs, various procedures can drain the fluid and help prevent it building up again. See pages 44–47 in the *Managing symptoms* chapter for more details.

Palliative treatment is one aspect of palliative care, in which a team of health professionals aims to meet your physical, emotional, cultural, spiritual and social needs. The team also supports families and carers.

- ▶ See our *Understanding Palliative Care* and *Living with Advanced Cancer* booklets, and listen to *The Thing About Advanced Cancer* podcast series.



## Lillian's story

*Two days after my 34th birthday I woke up with a sore shoulder and arm. I didn't think too much of it because the pain went away quickly.*

*After I felt a lump on my left collarbone, I mentioned it to my dad and brother because they're doctors. They said it was probably because I'd had a cough in the past weeks but to get an ultrasound.*

*After having some further scans and tests, it was confirmed to be stage 4 non-small cell lung cancer. I was devastated.*

*When I tell someone that I have lung cancer, the first thing most people say is "did you smoke?". While I think that people have the best intentions and it's human nature to want to find the cause of a problem, does it really matter whether I had smoked or not?*

*I have never smoked, but if I did smoke, even if it was just one cigarette, should I feel that somehow it's my fault?*

*I want to reduce the stigma suffered by lung cancer patients and their families who are already going through so much.*

*I use statistics to educate people and raise awareness. I explain that many other lifestyle choices are linked to cancer and that smoking causes other health conditions, such as cardiovascular diseases and other cancers. I let them know that 1 in 3 women diagnosed with lung cancer has never smoked, such as myself.*

*A lot of the people I've met with lung cancer, say they're guarded about their diagnosis. One carer said she didn't tell anyone for 3 years that her spouse had lung cancer for fear of being stigmatised. There needs to be a lot more compassion.*

*I think that taking away the stigma will lead to greater funding for research. I am feeling hopeful about my future. It's important to me to stay in the moment and appreciate what I have.*

## Key points about treating lung cancer

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### Choice of treatment

Treatment will depend on the type of lung cancer and its stage, as well as your general fitness, lung function and suitability for the treatment.

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### Curative treatment

This is treatment aimed at making all signs of the cancer go away permanently. It may involve:

- surgery – a whole lung, a lobe or part of a lobe may be removed; not usually used for SCLC
  - radiation therapy – uses targeted radiation to damage or kill cancer cells and may be offered on its own or together with surgery or chemotherapy. Side effects may include pain when swallowing, heartburn, fatigue, red or dry skin, shortness of breath or a cough
  - chemotherapy – uses drugs to kill cancer cells or slow their growth. Side effects can include anaemia, increased risk of infections, mouth ulcers, hair loss from head and chest, and nausea, vomiting or constipation
  - immunotherapy – uses drugs to help the immune system fight lung cancer. Side effects may include fatigue, rash, painful joints and diarrhoea
  - targeted therapy – uses drugs that target specific features in cancer cells. Side effects may include acne-like rash, fatigue, diarrhoea, nausea or vomiting.
- 

### Palliative treatment for advanced lung cancer

The goal of palliative treatment is to slow the spread of cancer and manage symptoms without trying to cure the cancer. Palliative treatment may include:

- chemotherapy
  - immunotherapy
  - targeted therapy
  - radiation therapy.
-

# Managing symptoms

For many people, lung cancer is diagnosed at an advanced stage. In these cases, the main goal of treatment is to manage symptoms and keep them under control for as long as possible. This chapter describes procedures and strategies for managing the most common symptoms of lung cancer. As you may have several symptoms, you may be given a combination of treatments. Keep in mind that you won't necessarily experience every symptom listed here.

## Breathlessness

Many people with lung cancer have difficulty breathing and shortness of breath (dyspnoea) before or after diagnosis. These can occur for several reasons, such as the cancer itself and a reduction in lung function, a drop in fitness level due to less physical activity, or a build-up of fluid between the linings of the lung (pleural effusion).

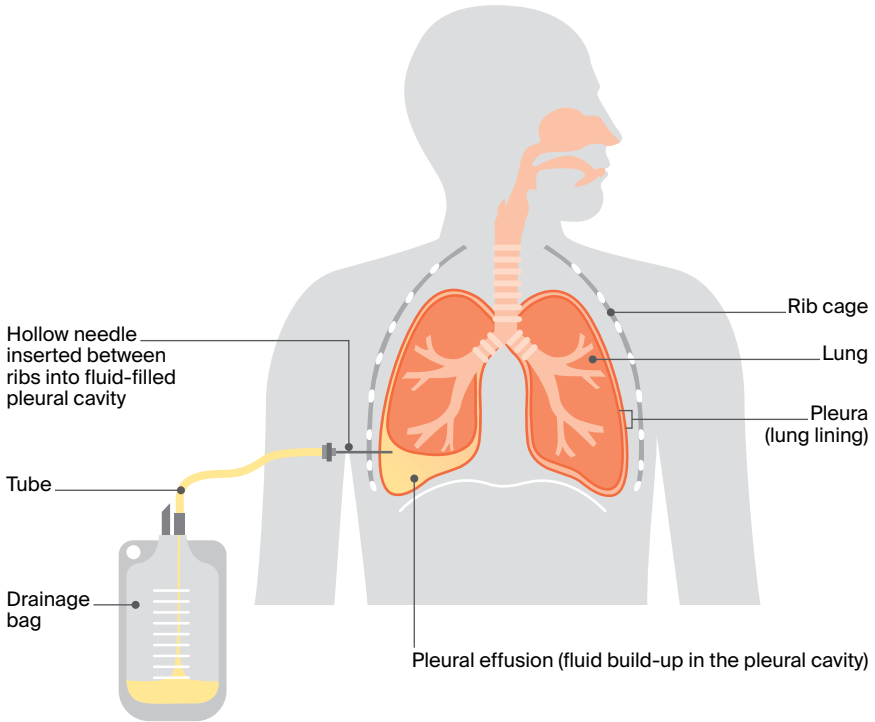
If breathlessness is caused by pleural effusion, you may need to have surgery. Types of surgery include:

- pleural tap to drain the fluid (see opposite)
- pleurodesis to stop fluid building up again (see page 46)
- an indwelling pleural catheter (see page 47).

If the cancer is blocking one of the main airways, a doctor may be able to use a laser, stent (a metal or plastic tube) or radiation therapy to open up the airway and improve breathing. You may also be referred to a pulmonary rehabilitation course to learn how to manage breathlessness. This will include exercise training, breathing techniques, ways to clear the airways, and tips for pacing yourself.

## Having a pleural tap

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For some people, fluid may build up in the pleural cavity, the space between the 2 layers of thin tissue covering the lung. The build-up of fluid is called pleural effusion. This can put pressure on the lung, making it hard to breathe. Having a pleural tap can relieve this symptom. This procedure is also known as pleurocentesis or thoracentesis.

To drain the fluid, your doctor or radiologist numbs the area with a local anaesthetic and inserts a hollow needle between your ribs into the pleural cavity. It then takes about 30–60 minutes to drain the fluid. You usually don't have to stay overnight in hospital after a pleural tap. A sample of the fluid is sent to a laboratory for testing.

If you smoke, your doctor will advise you to quit and suggest ways to do this. For some ideas about how to manage breathlessness at home, see the suggestions on pages 48–49.

## **Pleurodesis**

Pleurodesis is a way to close the pleural cavity. Your doctors might recommend this procedure if the fluid builds up again after you have had a pleural tap. It may be done by a thoracic surgeon or respiratory physician in one of 2 ways, depending on how well you are and what you would prefer:

**VATS pleurodesis** – This method uses a keyhole approach called video-assisted thoracoscopic surgery (VATS). You will be given a general anaesthetic, then a tiny video camera and operating instruments will be passed through one or more small cuts in the chest. After all fluid has been drained, the surgeon then injects some sterile talcum powder into the pleural cavity. This causes inflammation that helps fuse the 2 layers of the pleura together and prevents fluid from building up again. You will stay in hospital for a few days.

**Bedside talc slurry pleurodesis** – If you are unable to have a general anaesthetic, a pleurodesis can be done under local anaesthetic while you are in bed. A small cut is made in the chest, then a tube is inserted into the pleural cavity. Fluid can be drained through the tube into a bottle.

*“Now I have good and bad days. I do breathing exercises during rehabilitation. Sometimes I feel so good that I overdo it. I forget that I have one lung and I tire easily. I’m learning to pace myself.”* LOIS





Lung Foundation Australia provides more information about living with lung cancer. Visit [lungfoundation.com.au/patients-carers/conditions/lung-cancer/resources](https://lungfoundation.com.au/patients-carers/conditions/lung-cancer/resources) to find written information and videos. You can also contact their Lung Cancer Support Nurse by calling 1800 654 301.

Next, sterile talcum powder mixed with salt water (a “slurry”) is injected through the tube into the pleural cavity. Nurses will help you move into various positions every 10 minutes to get the talc slurry to spread throughout the pleural cavity. The process takes about an hour.

A slurry pleurodesis usually requires a hospital stay of 2-3 days. After the procedure, some people experience a burning pain in the chest for a day or two, but this can be eased with medicines.

## **Indwelling pleural catheter**

An indwelling pleural catheter is a small tube used to drain fluid from around the lungs. It may be offered to people who repeatedly have a build-up of fluid in the pleural cavity that makes it hard to breathe and who are unable to or prefer not to have a pleurodesis.

You will be given a local anaesthetic, then the doctor inserts the catheter through the chest wall into the pleural cavity. One end of the tube is inside the chest, and the other stays outside the body for drainage. This end is coiled and tucked under a small dressing.

When fluid builds up and needs to be drained (usually once or twice a week), the end of the catheter is connected to a small bottle. You can manage the catheter at home with the help of a community nurse. A family member or friend can also be taught how to clear the catheter, which may be more convenient.

## Improving breathlessness at home

It can be distressing to feel short of breath, but several simple strategies can help provide some relief from breathlessness at home.

### Treat other conditions



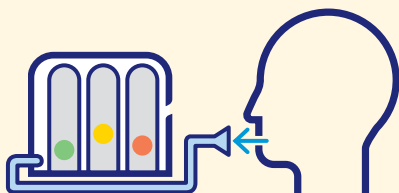
Let your doctor know if you feel breathless. Conditions such as anaemia, a lung infection or chronic obstructive pulmonary disease may also make you feel short of breath and these can often be treated.

### Sleep more upright



Use a recliner chair or prop yourself up in bed to help you sleep in a more upright position. An occupational therapist may be able to recommend a special pillow for sleeping.

### Check if equipment could help



Ask your health care team about equipment to manage breathlessness. To improve your lung capacity, you can blow into a lightweight device called an incentive spirometer. You may be able to use an oxygen concentrator at home to deliver oxygen to your lungs, or a portable oxygen cylinder for outings. If you have a cough or wheeze, you may benefit from a nebuliser, a device that delivers medicine to your lungs.

### Relax on a pillow



Rest your head and upper chest on a table with a pillow. Bend from your hips and keep your back straight. This helps to relax your breathing muscles.

## Ask about medicines



Talk to your doctor about medicines, such as a low dose of morphine, to ease breathlessness. It is important to keep any chest pain well controlled because pain may prevent you from breathing deeply.

## Modify your movement



Some types of gentle exercise can help but check with your doctor first. An exercise physiologist, physiotherapist or occupational therapist from your treatment centre can explain how to modify your activities to improve breathlessness.

## Create a breeze



Use a handheld fan to direct a cool stream of air across your face if you feel short of breath when not exerting yourself. You may also find it helpful to sit by an open window.

## Find ways to relax



Listen to a relaxation recording or learn other ways to relax. This can help you to control anxiety and breathe more easily. Some people find breathing exercises, acupuncture and meditation helpful.

- ▶ See our *Understanding Complementary Therapies* booklet and listen to the relaxation and meditation recordings in our *Finding Calm During Cancer* podcast series.

# Pain

Pain can be a symptom of lung cancer and a side effect of treatment. If pain is not controlled, it can affect your quality of life and how you cope with treatments.

There are different ways to control pain. Aside from medicines, various procedures can manage any build-up of fluid that is causing pain (see pages 44–47). Radiation therapy and chemotherapy can reduce pain by shrinking a lung tumour. Surgery may help treat pain from bones: for example, if the cancer has spread to the spine and is pressing on nerves (nerve compression).



## Coping with pain

- Tell your doctor when you are in pain so they can help you find a way to control it. A palliative care or pain specialist may be able to help hard-to-manage pain.
  - Keep track of your pain in a diary – note what the pain feels like, how intense it is, where it comes from and travels to, how long it lasts and if it goes away with a specific medicine or another therapy such as a heat pack.
  - Allow a few days for your body to adjust to the dose of pain medicine and for drowsiness to improve.
  - Take pain medicine regularly as prescribed, even when you are not in pain. It's better to stay on top of the pain.
  - Use a laxative regularly to prevent or relieve constipation from pain medicines.
  - Try learning relaxation or meditation techniques to help you cope with pain.
- ▶ See our *Understanding Cancer Pain* booklet and listen to our "Managing Cancer Pain" podcast episode.

## Poor appetite and weight loss

Some people stop feeling interested in eating and lose weight before lung cancer is diagnosed. These symptoms may be caused by the disease itself, or by feeling sick, having difficulty swallowing, being breathless, or feeling down (see page 57).

Weight loss can affect how your body responds to cancer treatment, chances of infection, and recovery. This can happen to anyone, no matter what size or shape. Eating well will help you cope better with day-to-day living, treatment and side effects, and improve your quality of life.



### Eating when you have little appetite

- Choose high-kilojoule and high-protein foods (e.g. add cheese or cream to meals).
  - Try eating smaller portions more often (e.g. 5–6 smaller meals per day).
  - Avoid drinking fluids at mealtimes, which can fill you up too quickly.
  - Eat moist food such as scrambled eggs. If you have a sore mouth, moist foods tend to cause less irritation.
  - Eat fresh salads or cold foods if hot food smells make you feel sick. Avoid fatty or sugary foods if these make you feel sick.
  - Add ice-cream or fruit to a drink to increase kilojoules.
  - Eat more of your favourite foods – follow your cravings.
  - Talk to a dietitian for more tips on what to eat – they can suggest small changes to your diet that can help you stay well nourished.
  - Ask your dietitian if you need to use protein drinks or nutritional supplements and which ones to buy.
- ▶ See our *Nutrition for People Living with Cancer* booklet for more tips on staying well nourished.

# Fatigue

It is common to feel very tired during or after treatment, and you may lack the energy to carry out day-to-day activities. Fatigue for people with cancer is different from tiredness, as it may not go away with rest or sleep. You may lose interest in things that you usually enjoy doing or feel unable to concentrate on one thing for very long.

Let your treatment team know if you are struggling with fatigue. Sometimes fatigue can be caused by a low red blood cell count (anaemia), or be a side effect of drugs or a sign of depression, all of which can be treated. There are also many hospital and other programs available to help you manage fatigue.



## Managing fatigue

- Set small, manageable goals for the day, and rest before you get too tired.
- Plan breaks throughout the day when you are completely still for a while. An eye pillow can help at these times.
- Leave plenty of time to get to appointments.
- Ask your doctor about what sort of exercise would be suitable. An exercise physiologist or physiotherapist can help with safe and appropriate exercise plans.
- An occupational therapist can show you relaxation techniques, breathing exercises and ways to conserve your energy.
- Consider acupuncture – some people find it helps with fatigue.
- Say no to things you really don't feel like doing.
- ▶ See our *Fatigue and Cancer* fact sheet and listen to our “Managing Cancer Fatigue” podcast episode.

## Difficulty sleeping

Getting a good night's sleep is important for maintaining your energy levels, reducing fatigue and improving mood. Pain, breathlessness, anxiety or depression can make it hard to sleep. Some medicines can also disrupt sleep. If you already had sleep problems before the lung cancer diagnosis, these could become worse.

Talk to your doctor about what might help improve your ability to sleep. Your medicines may need adjusting or sleep medicines may be an option. Talking to a counsellor may help if you feel anxious or depressed. Some strategies that people with cancer have found helpful are listed below.



### Getting a better night's sleep

- Try to do some gentle physical activity every day. Exercising may help you to sleep better. An exercise physiologist or physiotherapist can tailor an exercise program for you. See our *Exercise for People Living with Cancer* booklet.
- Limit or cut out alcohol, caffeinated drinks, nicotine and spicy food.
- Avoid watching television or using a computer, smartphone or tablet before bed, as their light tells your body it's time to wake up.
- Follow a regular routine before bed and set up a calm sleeping environment. Ensure the room is dark, quiet and a comfortable temperature.
- Practise mindfulness, such as listening to a meditation recording. Or listen to gentle relaxation music.
- ▶ Listen to our "Sleep and Cancer" podcast episode and the sleep episode in our *Finding Calm During Cancer* podcast series.

## Key points about managing symptoms

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### Shortness of breath

Breathlessness can be managed with:

- surgical procedures – including pleural tap to drain fluid, pleurodesis to stop fluid building up, and an indwelling pleural catheter to drain fluid
- pulmonary rehabilitation – including exercise training and breathing techniques
- medicines – such as low doses of morphine
- self-management – such as sleeping upright, gentle exercise, using a handheld fan, positioning pillows and relaxation techniques.

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### Pain

Pain can be managed with:

- pain medicines
- surgical procedures that drain fluid or reduce the size of the cancer
- radiation therapy or chemotherapy
- self-management – such as keeping a symptom diary, relaxation and meditation.

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### Other symptoms

Many people with lung cancer also experience:

- poor appetite and weight loss – see a dietitian for ways to make food nutritious and appealing
- fatigue – pace yourself, accept help and find ways to exercise; an exercise physiologist or physiotherapist can prepare a suitable exercise plan for you and an occupational therapist can help you learn ways to manage fatigue and conserve energy
- difficulty sleeping – try to do some gentle physical activity every day, avoid watching television or using a computer, smartphone or tablet before bed, and have a set bedtime routine.



# Looking after yourself

Cancer can cause physical and emotional strain, so it's important to look after your wellbeing. Cancer Council has free booklets and programs to help you during and after treatment. Call 13 11 20 to find out more, or visit your local Cancer Council website (see back cover).

**Eating well** – Healthy food can help you cope with treatment and side effects. A dietitian can explain how to manage any special dietary needs or eating problems and choose the best foods for your situation.

▶ See our *Nutrition for People Living with Cancer* booklet.

**Staying active** – Physical activity can reduce tiredness, improve circulation and lift mood. The right exercise for you depends on what you are used to, how you feel, and your doctor's advice.

▶ See our *Exercise for People Living with Cancer* booklet.

**Complementary therapies** – Complementary therapies are designed to be used alongside conventional medical treatments. Therapies such as massage, relaxation and acupuncture can increase your sense of control, decrease stress and anxiety, and improve your mood. Let your doctor know about any therapies you are using or thinking about trying, as some may not be safe or evidence-based.

▶ See our *Understanding Complementary Therapies* booklet.



Alternative therapies are therapies used instead of conventional medical treatments. These are unlikely to be scientifically tested, may prevent successful treatment of the cancer and can be harmful. Cancer Council does not recommend the use of alternative therapies as a cancer treatment.

**Work and money** – Cancer can change your financial situation, especially if you have extra medical expenses or need to stop working. Getting professional financial advice and talking to your employer can give you peace of mind. You can also check whether any financial assistance is available to you by asking a social worker at your hospital or treatment centre or calling Cancer Council 13 11 20.

▶ See our *Cancer and Your Finances* and *Cancer, Work & You* booklets.

**Relationships** – Having cancer can affect your relationships with family, friends and colleagues in different ways. Cancer is stressful, tiring and upsetting, and this may strain relationships. The experience of cancer may also result in positive changes to your values, priorities or outlook on life. Give yourself time to adjust to what's happening, and do the same for those around you. It may help to discuss your feelings with each other.

▶ See our *Emotions and Cancer* booklet.

**Sexuality** – Cancer can affect your sexuality in physical and emotional ways. The impact of these changes depends on many factors, such as treatment and side effects, your self-confidence, and if you have a partner. Although sexual intercourse may not always be possible, closeness and sharing can still be part of your relationship.

▶ See our *Sexuality, Intimacy and Cancer* booklet.

**Contraception and fertility** – If you can have sex, you may need to use certain types of contraception to protect your partner or avoid pregnancy for a time. Your doctor will explain what precautions to take. They will also tell you if treatment will affect your fertility permanently or temporarily. If having children is important to you, discuss the options with your doctor before starting treatment.

▶ See our *Fertility and Cancer* booklet.

# Living with lung cancer

Life after a diagnosis of lung cancer can present many challenges. It is important to allow yourself time to adjust to the physical and emotional changes. Establish a daily routine that suits you and the symptoms you're coping with. Your family and friends may also need time to adjust.

For some people, the cancer goes away with treatment. Other people will have ongoing treatment to manage symptoms. You are likely to feel a range of emotions about having lung cancer. Talk to your treatment team if you are finding it hard to manage your emotions. Cancer Council 13 11 20 can also provide you with some strategies for coping with the emotional and practical aspects of living with lung cancer.

► See our *Emotions and Cancer* booklet.

## Dealing with feelings of sadness

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If you have continued feelings of sadness, have trouble getting up in the morning or have lost motivation to do things that previously gave you pleasure, you may be experiencing depression. This is quite common among people who have had cancer.

Talk to your GP, because counselling or medication – even for a short time – may help. Some people can get a Medicare rebate for sessions

with a psychologist. Cancer Council may also run a counselling program in your area.

For information about coping with depression and anxiety, call Beyond Blue on 1300 22 4636 or visit [beyondblue.org.au](http://beyondblue.org.au). For 24-hour crisis support, call Lifeline 13 11 14 or visit [lifeline.org.au](http://lifeline.org.au).

## Follow-up appointments

Whether treatment ends or is ongoing, you will have regular appointments to manage any long-term side effects and check that the cancer hasn't come back or spread. During these check-ups, you will usually have a physical examination and you may have chest x-rays, CT scans and blood tests. You will also be able to discuss how you're feeling and mention any concerns you may have.

Check-ups after treatment usually happen every 3–6 months for the first couple of years and every 6–12 months for the following 3 years. When a follow-up appointment or test is approaching, many people feel anxious. Talk to your treatment team or call Cancer Council 13 11 20 if you are finding it hard to manage this anxiety.

Between follow-up appointments, let your doctor know immediately of any symptoms or health problems.

## What if the cancer returns?

For some people, lung cancer does come back after treatment, which is known as a recurrence. Lung cancer is more likely to recur in the first 5 years after diagnosis. If the cancer returns, your doctor will discuss treatment options with you. These will depend on the type of lung cancer, where the cancer has recurred, and the stage and grade.

Whichever treatment you are given or choose to have, support from palliative care specialists and nurses can help you manage symptoms. Talk to your doctor about how to get this support.

- ▶ See our *Understanding Palliative Care* booklet or listen to our podcast series *The Thing About Advanced Cancer*.

# Caring for someone with cancer

You may be reading this booklet because you are caring for someone with lung cancer. What this means for you will vary depending on the situation. Being a carer can bring a sense of satisfaction, but it can also be challenging and stressful.

It is important to look after your own physical and emotional wellbeing. Give yourself some time out and share your concerns with somebody neutral such as a counsellor or your doctor, or try calling Cancer Council 13 11 20. There is a wide range of support available to help you with the practical and emotional aspects of your caring role.

**Support services** – Support services such as Meals on Wheels, home help or visiting nurses can help you in your caring role. You can find local services, as well as information and resources, through the Carer Gateway. Call 1800 422 737 or visit [carergateway.gov.au](http://carergateway.gov.au).

**Support groups and programs** – Many cancer support groups and cancer education programs are open to carers as well as to people with cancer. Support groups and programs offer the chance to share experiences and ways of coping.

**Carers Australia** – Carers Australia provides information and advocacy for carers. Visit [carersaustralia.com.au](http://carersaustralia.com.au).

**Cancer Council** – You can call Cancer Council 13 11 20 or visit your local Cancer Council website to find out more about carers' services.

▶ See our *Caring for Someone with Cancer* booklet.

# Seeking support

A cancer diagnosis can affect every aspect of your life. You will probably experience a range of emotions – fear, sadness, anxiety, anger and frustration are all common reactions. Cancer also often creates practical and financial issues.

There are many sources of support and information to help you, your family and carers navigate all stages of the cancer experience, including:

- information about cancer and its treatment
- access to benefits and programs to ease the financial impact of cancer treatment
- home care services, such as Meals on Wheels, visiting nurses and home help
- aids and appliances
- support groups and programs
- counselling services.

The availability of services may vary depending on where you live, and some services will be free but others might have a cost.

To find good sources of support and information, you can talk to the social worker or nurse at your hospital or treatment centre, or get in touch with Cancer Council on 13 11 20.

*“My family members don’t really understand what it’s like to have cancer thrown at you, but in my support group, I don’t feel like I have to explain.”* SAM

## Support from Cancer Council

Cancer Council offers a range of services to support people affected by cancer, their families and friends. Services may vary by location.

### Cancer Council 13 11 20



Our experienced health professionals will answer any questions you have about your situation and link you to local services (see inside back cover).

### Information resources



Cancer Council produces booklets and fact sheets on more than 25 types of cancer, as well as treatments, emotional and practical issues, and recovery. Call 13 11 20 or visit your local Cancer Council website.

### Legal and financial support



If you need advice on legal or financial issues, we can refer you to qualified professionals. These services are free for people who can't afford to pay. Financial assistance may also be available. Call Cancer Council 13 11 20 to ask if you are eligible.

### Practical help



Cancer Council can help you find services or offer guidance to manage the practical impacts of cancer. This may include helping you access accommodation and transport services.

### Peer support services



You might find it helpful to share your thoughts and experiences with other people affected by cancer. Cancer Council can link you with individuals or support groups by phone, in person, or online. Call 13 11 20 or visit [cancerCouncil.com.au/OC](http://cancerCouncil.com.au/OC).

## Useful websites

You can find many useful resources online, but not all websites are reliable. The websites listed below are good sources of support and information.

### Australian

Cancer Council Australia	<a href="http://cancer.org.au">cancer.org.au</a>
Cancer Council Online Community	<a href="http://cancercouncil.com.au/OC">cancercouncil.com.au/OC</a>
Cancer Council podcasts	<a href="http://cancercouncil.com.au/podcasts">cancercouncil.com.au/podcasts</a>
Guides to Best Cancer Care	<a href="http://cancer.org.au/cancercareguides">cancer.org.au/cancercareguides</a>
Australasian Lung Cancer Trials Groups	<a href="http://altg.com.au">altg.com.au</a>
Australian Clinical Trials	<a href="http://australianclinicaltrials.gov.au">australianclinicaltrials.gov.au</a>
Cancer Australia	<a href="http://canceraustralia.gov.au">canceraustralia.gov.au</a>
Carer Gateway	<a href="http://carergateway.gov.au">carergateway.gov.au</a>
Carers Australia	<a href="http://carersaustralia.com.au">carersaustralia.com.au</a>
eviQ Cancer Treatments Online	<a href="http://eviq.org.au">eviq.org.au</a>
Department of Health and Aged Care	<a href="http://health.gov.au">health.gov.au</a>
Healthdirect Australia	<a href="http://healthdirect.gov.au">healthdirect.gov.au</a>
Lung Foundation Australia	<a href="http://lungfoundation.com.au">lungfoundation.com.au</a>
Palliative Care Australia	<a href="http://palliativecare.org.au">palliativecare.org.au</a>
Radiation Oncology: Targeting Cancer	<a href="http://targetingcancer.com.au">targetingcancer.com.au</a>
Services Australia (including Centrelink and Medicare)	<a href="http://servicesaustralia.gov.au">servicesaustralia.gov.au</a>
Thoracic Oncology Group Australasia	<a href="http://thoraciconcology.org.au">thoraciconcology.org.au</a>

### International

American Cancer Society	<a href="http://cancer.org">cancer.org</a>
Cancer Research UK	<a href="http://cancerresearchuk.org">cancerresearchuk.org</a>
Macmillan Cancer Support (UK)	<a href="http://macmillan.org.uk">macmillan.org.uk</a>



# Question checklist

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Asking your doctor questions will help you make an informed choice. You may want to include some of the questions below in your own list.

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## Diagnosis

- What type of lung cancer do I have?
  - Has the cancer spread? If so, where has it spread? How fast is it growing?
  - Are the latest tests and treatments for this cancer available in this hospital?
  - Will a multidisciplinary team be involved in my care?
  - Are there clinical guidelines for this type of cancer?
- 

## Treatment

- What treatment do you recommend? What is the aim of the treatment?
  - Are there other treatment choices for me? If not, why not?
  - If I don't have the treatment, what should I expect?
  - How long do I have to make a decision?
  - I'm thinking of getting a second opinion. Can you recommend anyone?
  - How long will treatment take? Will I have to stay in hospital?
  - Are there any out-of-pocket expenses not covered by Medicare or my private health cover? Can the cost be reduced if I can't afford it?
  - How will we know if the treatment is working?
  - Are there any clinical trials or research studies I could join?
  - Can I stop the treatment after I have started?
- 

## Side effects

- What are the risks and possible side effects of each treatment?
  - I sometimes feel breathless. Who can help me with that?
  - Will I have a lot of pain? What will be done about this?
  - Can I work, drive and do my normal activities while having treatment?
  - Will the treatment affect my sex life and fertility?
  - Are there any complementary therapies that might help me?
- 

## After treatment

- How often will I need check-ups after treatment?
  - If the cancer returns, how will I know? What treatments could I have?
-

# Glossary

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## **adenocarcinoma**

Cancer that starts in the mucus-producing (glandular) cells that form part of the lining of the lungs and other internal organs.

## **adrenal glands**

Triangular glands resting on the top of each kidney that produce adrenaline and other hormones.

## **advanced cancer**

Cancer that is unlikely to be cured. In most cases, the cancer has spread to other parts of the body. Treatment can often still control the cancer and manage symptoms.

## **alveoli**

The tiny air sacs in the lungs, where oxygen enters the blood, and carbon dioxide leaves the blood.

## **anaesthetic**

A drug that stops a person feeling pain during a medical procedure. Local and regional anaesthetics numb part of the body; a general anaesthetic causes a temporary loss of consciousness.

## **asbestos**

A naturally occurring silicate mineral that forms long crystallised fibres. Formerly used in manufacturing and building, asbestos is now banned in Australia because the fibres can cause serious illness, including lung cancer.

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## **benign**

Not cancerous or malignant.

## **biopsy**

The removal of a sample of tissue from the body for examination under a microscope to help diagnose a disease.

## **breathlessness**

The sensation of shortness of breath or difficulty breathing. Also called dyspnoea.

## **bronchioles**

The smallest airways (tubes) that carry air into the outer part of a lung.

## **bronchoscopy**

A test that uses a flexible tube with a light and camera to examine the airways and lungs and take tissue samples.

## **bronchus (plural: bronchi)**

The large airway or tube that carries air into the lung.

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## **catheter**

A hollow, flexible tube through which fluids can be passed into the body or drained from it.

## **cells**

The basic building blocks of the body. A human is made of billions of cells that perform different functions.

## **chemoradiation**

Treatment that combines chemotherapy with radiation therapy. Also called chemoradiotherapy.

## **chemotherapy**

A cancer treatment that uses drugs to kill cancer cells or slow their growth. May be given alone or in combination with other treatments.

## **CT scan**

Computerised tomography scan. This scan uses x-rays to create detailed cross-sectional pictures of the body.

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## **diaphragm**

A dome-like sheet of muscle that divides the chest cavity from the abdomen and is used in breathing.

## **dyspnoea**

See breathlessness.

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### **emphysema**

A benign (non-cancerous) condition in which the alveoli of the lungs are enlarged and damaged, usually due to smoking. It reduces the lung surface, causing breathing difficulties.

### **endobronchial ultrasound (EBUS)**

A type of bronchoscopy that uses a flexible tube with a small ultrasound probe to examine the airways and lungs and take tissue samples.

### **external beam radiation therapy (EBRT)**

Radiation therapy delivered to the cancer from outside the body.

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### **genes**

The microscopic units that determine how the body's cells grow and behave.

### **genetic marker**

A gene or DNA sequence associated with a particular characteristic.

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### **immune system**

A network of cells and organs that defends the body against attacks by foreign invaders, such as bacteria and viruses. Includes the lymphatic system.

### **immunotherapy**

Drugs that use the body's own immune system to fight cancer.

### **intravenous (IV)**

Injected into a vein.

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### **large cell undifferentiated carcinoma**

A type of lung cancer that usually develops in the airways and is characterised by large rounded cells.

### **lobe**

A section of an organ. The left lung has 2 lobes and the right lung has 3 lobes.

### **lobectomy**

Surgery to remove a lobe of a lung.

### **lungs**

The 2 spongy organs in the chest. The lungs are made up of many tiny air sacs and are used for breathing.

### **lymph nodes/glands**

Small, bean-shaped structures that collect and destroy bacteria and viruses.

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### **malignant**

Cancerous. Malignant cells can spread (metastasise) and eventually cause death if they cannot be treated.

### **mediastinoscopy**

A surgical procedure for examining the lymph nodes at the centre of the chest and removing a sample, if necessary.

### **mediastinum**

The area in the chest between the lungs. It contains the heart and large blood vessels, the oesophagus, the trachea and many lymph nodes.

### **metastasis (plural: metastases)**

Cancer that has spread from a primary cancer in another part of the body. Also called secondary or advanced cancer.

### **molecular test**

Tests that look for changes in genes involved in cancer.

### **MRI scan**

A magnetic resonance imaging (MRI) scan uses magnetic fields and radio waves to take detailed cross-sectional pictures of the body.

### **mutation**

A change in a gene causing a permanent change in the DNA sequence that makes up the gene.

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### **non-small cell lung cancer (NSCLC)**

One of the 2 main types of lung cancer. NSCLC includes adenocarcinoma, squamous cell carcinoma and large cell undifferentiated carcinoma.

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### **palliative treatment**

Medical treatment to help manage pain and other symptoms of advanced cancer.

### **parietal pleura**

The outer layer of the pleura that lines the chest wall and diaphragm.

### **PET-CT scan**

Positron emission tomography scan (in which a person is injected with a small amount of radioactive solution) combined with a CT scan.

### **phlegm**

Thick mucus in the lungs, throat and/or mouth. Also called sputum.

### **pleura**

The mesothelium (thin sheet of tissue) that lines the chest wall and covers the lungs. It has 2 layers: parietal and visceral.

### **pleural cavity (pleural space)**

The space between the layers of the pleura; normally contains a thin film of fluid.

### **pleural effusion**

A collection of fluid between the two layers of tissue that cover the lungs.

### **pleural mesothelioma**

Cancer that affects the layers of tissue that cover the lungs (the pleura).

### **pleural tap**

A procedure in which a hollow needle is inserted between the ribs to drain a build-up of fluid. Also called pleurocentesis or thoracentesis.

### **pleurodesis**

An injection of sterile talcum powder into the pleural cavity. This causes inflammation that closes the space and prevents fluid building up again.

### **pneumonectomy**

Surgery to remove a whole lung.

### **primary cancer**

The original cancer. Cells from the primary cancer may break away and be carried to

other parts of the body, where secondary cancers may form.

### **pulmonary**

Relating to the lungs.

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### **radiation therapy**

The use of targeted radiation to kill or damage cancer cells so they cannot grow, multiply or spread. The radiation is usually in the form of x-ray beams. Also called radiotherapy.

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### **sedation**

A drug that causes a state of calm.

### **segmentectomy**

Surgery to remove a small section of an organ (e.g. lung).

### **small cell lung cancer (SCLC)**

One of the 2 main types of lung cancer. It tends to spread early.

### **sputum**

Liquid coughed up from the lungs. Also known as phlegm.

### **sputum cytology test**

Examination of sputum under a microscope to look for cancer cells.

### **squamous cell carcinoma (SCC)**

Cancer that starts in the squamous cells, which are flat cells found on the surface of the skin or the lining of certain organs, such as the lungs, vagina and cervix.

### **staging**

Performing tests to work out how far a cancer has spread.

### **stereotactic body radiation therapy (SBRT)**

A type of radiation therapy that delivers high doses of precise radiation. Also called stereotactic ablative body radiation therapy.

### **systemic treatment**

Cancer drugs that spread throughout the whole body. Includes chemotherapy, targeted therapy, and immunotherapy.

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### targeted therapy

Drugs that target specific features of cancer cells to stop the cancer growing and spreading.

### thoracentesis

See pleural tap.

### thoracoscopy

A procedure for looking at the lungs with a thoracoscope, a thin tube with a tiny video camera. See also VATS.

### thoracotomy

Surgery in which a long cut is made between the ribs in the side of the chest to examine, biopsy and/or remove a tumour.

### trachea (windpipe)

The airway that brings inhaled air from the nose and mouth into the lungs.

### tumour

A new or abnormal growth of tissue on or in the body. A tumour may be benign (not cancer) or malignant (cancer).

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### video-assisted thoracoscopic surgery (VATS)

Keyhole surgery performed through several small cuts in the chest using a tiny video camera for guidance. See also thoracoscopy.

### visceral pleura layer

The inner layer of the pleura that is attached to the lungs.

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### wedge resection

Surgery to remove a small wedge or part of a lung, but not a complete lobe.

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### Can't find a word here?

For more cancer-related words, visit:

- [cancercouncil.com.au/words](http://cancercouncil.com.au/words)
- [cancervic.org.au/glossary](http://cancervic.org.au/glossary)

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## References

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2. National Comprehensive Cancer Network (US), *NCCN Clinical Practice Guidelines in Oncology (NCCN Guidelines): Non-Small Cell Lung Cancer, Version 3.2022*.
3. National Comprehensive Cancer Network (US), *NCCN Clinical Practice Guidelines in Oncology (NCCN Guidelines): Small Cell Lung Cancer, Version 2.2022*.
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5. Australian Institute of Health and Welfare (AIHW), *Cancer Data in Australia*, AIHW, Canberra, 2022, viewed 20 September 2022, available from [aihw.gov.au/reports/cancer/cancer-data-in-australia](http://aihw.gov.au/reports/cancer/cancer-data-in-australia).
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# How you can help

At Cancer Council, we're dedicated to improving cancer control. As well as funding millions of dollars in cancer research every year, we advocate for the highest quality care for cancer patients and their families. We create cancer-smart communities by educating people about cancer, its prevention and early detection. We offer a range of practical and support services for people and families affected by cancer. All these programs would not be possible without community support, great and small.

**Join a Cancer Council event:** Join one of our community fundraising events such as Daffodil Day, Australia's Biggest Morning Tea, Relay For Life, Girls' Night In and other Pink events, or hold your own fundraiser or become a volunteer.

**Make a donation:** Any gift, large or small, makes a meaningful contribution to our work in supporting people with cancer and their families now and in the future.

**Buy Cancer Council sun protection products:** Every purchase helps you prevent cancer and contribute financially to our goals.

**Help us speak out for a cancer-smart community:** We are a leading advocate for cancer prevention and improved patient services. You can help us speak out on important cancer issues and help us improve cancer awareness by living and promoting a cancer-smart lifestyle.

**Join a research study:** Cancer Council funds and carries out research investigating the causes, management, outcomes and impacts of different cancers. You may be able to join a study.

To find out more about how you, your family and friends can help, please call your local Cancer Council.



# Cancer Council

## 13 11 20

Being diagnosed with cancer can be overwhelming. At Cancer Council, we understand it isn't just about the treatment or prognosis. Having cancer affects the way you live, work and think. It can also affect our most important relationships.

When disruption and change happen in our lives, talking to someone who understands can make a big difference. Cancer Council has been providing information and support to people affected by cancer for over 50 years.

Calling 13 11 20 gives you access to trustworthy information that is relevant to you. Our experienced health professionals are available to answer your questions and link you to services in your area, such as transport, accommodation and home help. We can also help with other matters, such as legal and financial advice.

If you are finding it hard to navigate through the health care system, or just need someone to listen to your immediate concerns, call 13 11 20 and find out how we can support you, your family and friends.



If you need information in a language other than English, an interpreting service is available. Call 131 450.



If you are deaf, or have a hearing or speech impairment, you can contact us through the National Relay Service. [accesshub.gov.au](http://accesshub.gov.au)

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*Cancer Council services and programs vary in each area.  
13 11 20 is charged at a local call rate throughout Australia (except from mobiles).*

For information & support  
on cancer-related issues,  
call **Cancer Council 13 11 20**

## Visit your local Cancer Council website

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**Cancer Council ACT**  
[actcancer.org](http://actcancer.org)

**Cancer Council Queensland**  
[cancerqld.org.au](http://cancerqld.org.au)

**Cancer Council Victoria**  
[cancervic.org.au](http://cancervic.org.au)

**Cancer Council NSW**  
[cancercouncil.com.au](http://cancercouncil.com.au)

**Cancer Council SA**  
[cancersa.org.au](http://cancersa.org.au)

**Cancer Council WA**  
[cancerwa.asn.au](http://cancerwa.asn.au)

**Cancer Council NT**  
[cancer.org.au/nt](http://cancer.org.au/nt)

**Cancer Council Tasmania**  
[cancer.org.au/tas](http://cancer.org.au/tas)

**Cancer Council Australia**  
[cancer.org.au](http://cancer.org.au)

*This booklet is funded through the generosity of the people of Australia.  
To support Cancer Council, call your local Cancer Council or visit your local website.*

