

Understanding Lung Cancer

A guide for people with cancer, their families and friends



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Understanding Lung Cancer is reviewed approximately every 3 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 booklet 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 8 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 change the future of cancer, visit cancerconnect.org.au or call 13 11 20.



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 and present.



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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 also 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.¹⁻³



If you or your family have any questions or concerns, call **Cancer Connect on 13 11 20**. We can send you information and connect you with support services in your area. You can also visit the Cancer Connect website at cancerconnect.org.au.



Contents

About this booklet	1
What is cancer?	4
The lungs	6
Key questions	8
What is lung cancer?	8
What are the different types?	8
What are the risk factors?	8
How common is lung cancer?	11
What are the symptoms?	11
Which health professionals will I see?	12
Diagnosis	14
Screening test for lung cancer	14
Initial tests	15
Tests to confirm diagnosis	16
Staging lung cancer	21
Prognosis	23
Making treatment decisions	25
Treatment	27
Understanding the aim of treatment	27
Surgery	29
Types of lung surgery	30
Radiation therapy	33
Drug therapies	36
Palliative treatment	41

Managing symptoms 44

Breathlessness	44
Pain	50
Poor appetite and weight loss	51
Fatigue	52
Difficulty sleeping	53

Looking after yourself 55

Living with lung cancer 57

Follow-up appointments	58
What if the cancer returns?	58

Caring for someone with cancer 59

Seeking support 60

Support from Cancer Council	61
Useful websites	62

Question checklist 63

Glossary 64

How you can help 68

Key to icons

Icons are used throughout this booklet to indicate:



More information



Alert



Personal story



Tips

Is this Cancer Council booklet helpful?

Please follow this QR code for a quick 3-minute survey, or call 13 11 20 to provide your feedback.



SCAN ME

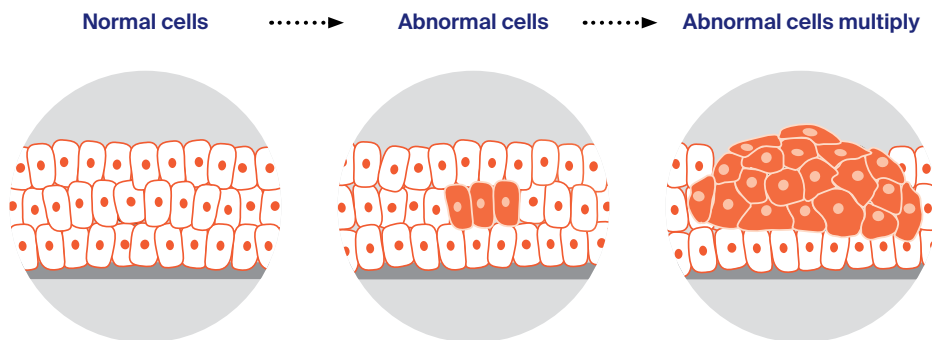
What is cancer?

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

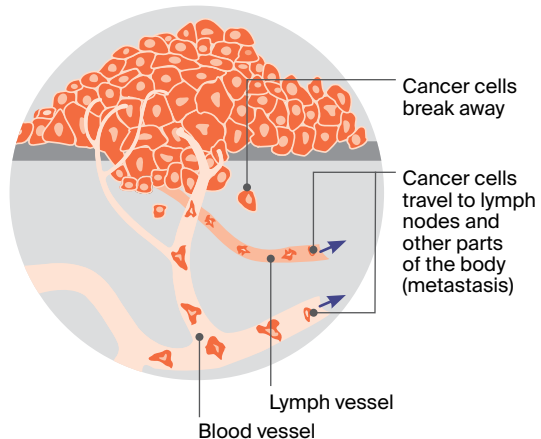
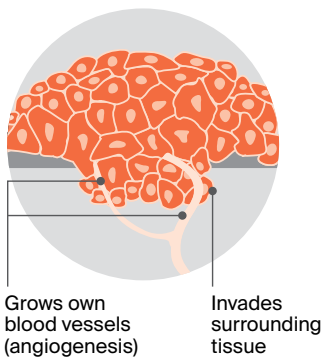


Not all tumours are cancer. Benign tumours tend to grow slowly and usually don't move into other parts of the body or turn into cancer. Cancerous tumours, also known as malignant tumours, have the potential to spread. They may invade nearby tissue, destroying normal cells. The cancer cells can break 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. The airways include big tubes called bronchi (one tube is a bronchus) and smaller tubes 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.

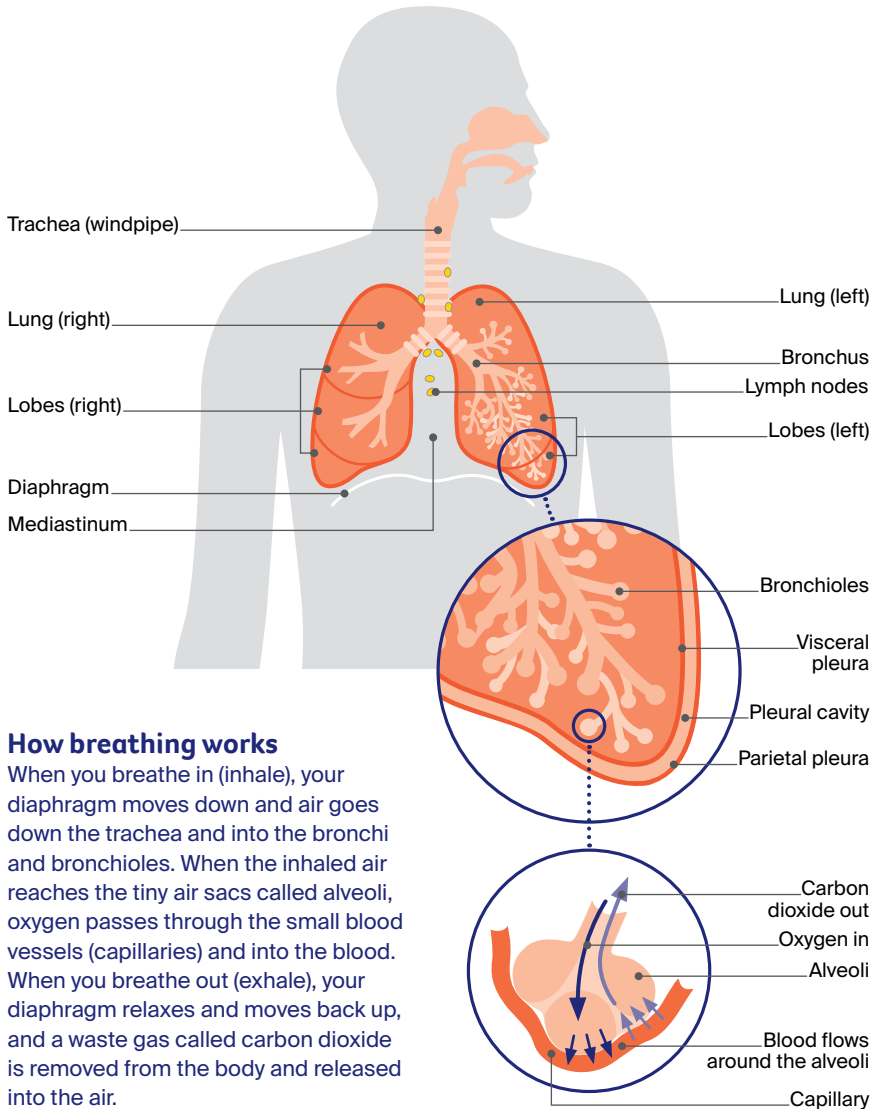
Diaphragm – The lungs rest on the diaphragm, which is a muscle that helps with breathing, and separates the chest from the abdomen (belly).

Mediastinum – The space between the lungs is called the mediastinum. Important structures in this space are:

- 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, viruses and other toxins.

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 space that can develop 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), your diaphragm moves down and air goes down the trachea and into the bronchi and bronchioles. When the inhaled air reaches the tiny air sacs called alveoli, oxygen passes through the small blood vessels (capillaries) and into the blood. When you breathe out (exhale), your diaphragm relaxes and moves back up, and a waste gas called 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. When cancer spreads to the lungs from another part of the body (e.g. breast or bowel), this is known as secondary or metastatic lung cancer. This booklet is about primary lung cancer only.

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 opposite). Pleural mesothelioma is a type of cancer that affects the covering of the lung (the pleura). It's different from lung cancer and is usually caused by exposure to asbestos. Other types of cancer, like cancers that start in the chest wall, and lung diseases such as silicosis, may also affect the lungs and have similar symptoms but are not considered lung cancer.

► See our *Understanding Mesothelioma* booklet.

Q: What are the risk factors?

A: A risk factor is anything that increases 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, but some people get lung cancer without having any risk factors. The following factors are known to increase the risk of lung cancer. This does not mean you will develop lung cancer. If you are concerned, talk to your doctor.

Types of lung cancer

non-small cell lung cancer (NSCLC)

NSCLCs (about 85% of lung cancers) may be classified as:

- **adenocarcinoma** – begins in mucus-producing cells; often found in outer part of the lungs
- **squamous cell carcinoma** – begins in thin, flat cells; often found in the airways
- **large cell undifferentiated carcinoma** – the cancer cells are not clearly squamous or adenocarcinoma.

Other, rarer types of non-small cell lung cancer are adenosquamous carcinoma, sarcomatoid carcinoma and salivary gland carcinoma.

small cell lung cancer (SCLC)

SCLCs (about 15% of lung cancers) tend to start in the middle of the lungs and usually spread faster than NSCLCs.

Tobacco smoking factors

Tobacco smoking is the largest preventable cause of lung cancer. The earlier a person starts smoking, the longer they smoke and the more they smoke, the higher their risk of developing lung cancer.

People who have never smoked can also get lung cancer. About 15% of men who get lung cancer have never smoked, and about 30% of women who get lung cancer have never smoked.⁴

Environmental or work-related factors

Second-hand smoke – Breathing in other people's tobacco smoke (second-hand smoke) may 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 mesothelioma (see page 8). 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, oil, or wood-burning cooking or heating) is another risk factor. Contact with the processing of arsenic, cadmium, steel and nickel, and exposure to diesel engine exhaust and welding fumes while working are also risk factors.

Working with materials that contain crystalline silica, such as stone, sand, rock, bricks, tiles, concrete and artificial stone, can make silica dust. Breathing in this dust can cause a lung disease called silicosis and can increase the risk of lung cancer. The use of engineered stone has been banned in Australia since July 2024.

Personal factors

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

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

Other conditions – Having another lung disease – lung fibrosis, chronic bronchitis, pulmonary tuberculosis, emphysema or COPD (chronic obstructive pulmonary disease) – or human immunodeficiency virus (HIV) increases the risk of lung cancer.

Q: How common is lung cancer?

A: About 15,100 Australians are diagnosed with lung cancer each year.⁵

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.⁶

Q: What are the symptoms?

A: The main symptoms of lung cancer are:

- a new cough that lasts more than 3 weeks, or a cough you have had for a long time that gets worse
- breathlessness or wheezing
- pain in the chest or shoulder
- a chest infection that comes back or lasts more than 3 weeks
- coughing or spitting up blood.

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

Having any of these symptoms does not mean that you have lung cancer; they may be caused by other conditions or from other effects of smoking. Sometimes, there are no symptoms and the cancer is found through screening (see page 14) or routine tests. If you have symptoms, see your doctor straightaway.



For an overview of what to expect at every stage of your cancer care, visit 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. You may also be referred to a specialist based on the results of your lung cancer screening test (see page 14). The specialist will

Health professionals you may see

GP	assists you with treatment decisions and works in partnership with your specialists in providing ongoing care
respiratory physician	diagnoses diseases of the lungs, including cancer, and recommends initial treatment options
thoracic surgeon	diagnoses and performs surgery for cancer and other diseases of the lungs and chest (thorax)
radiation oncologist	treats cancer by prescribing and overseeing a course of radiation therapy
radiation therapist	plans and delivers radiation therapy
radiologist, nuclear medicine specialist	analyse 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
medical oncologist	treats cancer with drug therapies such as chemotherapy, targeted therapy and immunotherapy (also known as systemic treatments)
cancer care coordinator or lung cancer nurse coordinator	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)

arrange further tests. If lung cancer is 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.

nurse	administers drugs and provides care, information and support throughout treatment
psychologist, counsellor	help you understand and manage your emotional response to diagnosis and treatment
dietitian	helps with nutrition concerns and recommends changes to diet during treatment and recovery
speech pathologist	helps with communication, speech and swallowing problems from the cancer, or after treatment
social worker	links you to support services and helps with emotional, practical and financial problems
occupational therapist	assists in adapting your living and working environment to help you resume your usual activities
physiotherapist, exercise physiologist	help to maintain and restore movement and mobility before and after treatment, and improve fitness and general wellbeing
palliative care specialists and nurses	work closely with the GP and cancer team to help control symptoms, maintain your quality of life and keep you comfortable and well looked after when cancer is advanced

Diagnosis

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

Screening test for lung cancer

Screening is the process of looking for signs of cancer in people who do not have any symptoms. The National Lung Cancer Screening Program offers eligible Australians a free low-dose CT (computerised tomography) scan every 2 years.

You are eligible for screening if:

- you are 50–70 years old
- you smoke tobacco cigarettes or quit smoking in the last 10 years
- you have a history of tobacco cigarette smoking of 30 pack-years or more. This means smoking at least a pack of cigarettes a day for 30 years, or 2 packs of cigarettes a day for 15 years
- you have no symptoms of lung cancer (see page 11).

Your healthcare provider can check if you are eligible for screening. Some healthcare providers may charge a fee for this consultation.

If you're eligible and want to do the screening, you'll get a referral to a radiology clinic for a free low-dose CT scan, which uses less radiation than a CT scan and does not involve injections (see opposite page). You lie still on a table while the scanner moves around you for a few minutes.

Your results will show your risk of lung cancer and be sent to your healthcare provider. You may need to talk about the results with your healthcare provider, and you will be contacted about what happens next. You may be invited to have another low-dose CT scan in 2 years if the screening test did not find anything significant. If your risk is high or very high, you will be referred to a specialist for tests (see pages 15–21).

For more information, call Cancer Connect on 13 11 20 or visit health.gov.au/our-work/nlcsp.

Initial tests

Initial tests may include a chest x-ray, a CT scan, 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. Smaller tumours may not show up or may be hidden by other organs.

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 information about the tumour, the lymph nodes 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.

You may have a liquid dye injected into a vein before the scan. 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 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 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.

Before having a CT scan, tell the doctor if you have any allergies or have had a reaction to contrast (dye) before. Let them know if you have diabetes or kidney disease, or are pregnant or breastfeeding.

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'll 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).

Tests to confirm diagnosis

If a tumour is suspected, you will need further tests to work out if it is lung cancer.

FDG PET–CT scan

This scan combines a PET (positron emission tomography) scan with a CT scan in one machine. A PET scan can provide detailed information about any cancer that is found. Sometimes a PET scan is done to work out if a biopsy is needed or to guide the biopsy procedure.

First, a small amount of safe radioactive glucose solution called fluorodeoxyglucose (FDG) is injected into a vein, usually in your arm. You will be asked to sit or lie 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 up to 30 minutes. You will need to fast (not eat or drink) before having this scan.

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

Biopsy

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

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

The doctor will pass the tube into your nose or mouth, down the trachea (windpipe) and into the bronchi. They can then remove samples of cells for testing. Afterwards, 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.

A new technology, called robotic bronchoscopy, may be available. It uses a robotic arm and navigation system to help a doctor guide a bronchoscope deep into the lungs. It can help reach the lung's smaller airways and the furthest parts of the lung to take a sample from a tumour. You will have light sedation and local anaesthetic, or a general anaesthetic, for this test.

Endobronchial ultrasound (EBUS) – This is a type of bronchoscopy that allows the doctor to see deeper in the lung. A special bronchoscope with an ultrasound probe uses soundwaves to create pictures that can show the size and position of a tumour. You will have light sedation and local anaesthetic, or a general anaesthetic.

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 between your lungs (mediastinum). Samples from the lymph nodes can help to confirm if they are also affected by cancer.

This procedure is now sometimes done using a CT scan to help take samples. The CT scan creates very detailed pictures of a tumour and helps the doctor to take cell samples from hard-to-reach parts of the lung.

Endoscopic ultrasound (EUS) – This is used to check whether the lung cancer has spread to the lymph nodes in the mediastinum. In an endoscopic ultrasound, a probe is put into your mouth and down your oesophagus, and a cell sample is taken from the lymph nodes. You will have light sedation and local anaesthetic, or a general anaesthetic.

Mediastinoscopy – This may be done to take larger samples from the lymph nodes found in the area between the lungs (mediastinum). 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 will have a general anaesthetic for this procedure.

Thoracoscopy – If other tests are unable to provide a diagnosis, you may have a thoracoscopy. This uses a thoracoscope (a thin tube with a light and camera) to look at and take a tissue sample from the lungs or



A new test known as liquid biopsy involves taking a blood sample and examining it for cancer. Liquid biopsy is still being studied, and it is not yet a routine way to diagnose lung cancer. It could help when a tissue biopsy is not safe to perform.

around the outer pleura. It's usually done under general anaesthetic with a type of keyhole surgery called video-assisted thoracoscopic surgery (VATS, see page 31).

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 by a radiologist using an ultrasound for guidance.

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. They help work out which immunotherapy and targeted therapy drugs are suitable to treat 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 happens after you are born (acquired mutation) is not the same thing as abnormal genes inherited from your parents. Most gene changes linked to lung cancer are not inherited. Lung cancers with gene mutations may be treated with a type of drug therapy called targeted therapy (see pages 38–39).

Proteins – If certain proteins are found in the biopsy sample from an NSCLC, the cancer may respond to immunotherapy (see pages 40–41). The most common protein that is tested for is called programmed death ligand-1 (PD-L1). It is on the surface of the cancer cells.

Other tests

You may have one of these tests to confirm a diagnosis or to check if the cancer has spread beyond the lung.

Sputum cytology – In this test, a sample of mucus from your lungs (called sputum or phlegm) is examined to see if it contains cancer cells. It's usually done if you are not well enough for a biopsy.

Sputum contains cells that line the airways, and is not the same as saliva. To collect a sample for this test, you'll be asked to cough deeply and forcefully into a small 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 the 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 that has built up around the lungs. A pleural tap can help to ease breathlessness (see page 44), and the fluid can be tested for cancer cells. It's mostly done with a local anaesthetic, with the doctor – often a radiologist – using ultrasound to guide the procedure.

MRI scan – An MRI (magnetic resonance imaging) scan shows if lung cancer has spread to the brain. It uses a powerful magnet and a computer to build up detailed pictures of your body.

Before the scan, you may be injected with a dye (known as contrast) that highlights any abnormalities in your brain. You may also be given medicine to help you relax. You will then lie on an examination table inside a metal tube that is open at both ends. The machine is noisy, so you may have headphones or earplugs and you can press a button if you are worried at any time. An MRI scan takes 30–45 minutes.

“It is hard to think about talking when you are diagnosed. You feel so overwhelmed with your own feelings that to share the diagnosis in a calm and controlled manner is hard.” JUDY

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

Other imaging tests – If a PET-CT scan is not available or the results are unclear, you may have a CT scan of the abdomen (belly) and pelvis or a bone scan.

Staging lung cancer

The tests described on pages 14–21 help 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 the TNM (tumour-nodes-metastasis) system, which considers the size of the tumour, whether it has affected lymph nodes, and whether it has spread.

This information may be combined to give the lung cancer an overall stage of 0, 1, 2, 3 or 4 (often written in Roman numerals as I, II, III or IV).

Sometimes, SCLC is staged using a different system that classifies the cancer as either limited stage or extensive stage. For more information about these 2 staging systems, see the tables on the next page.

Staging NSCLC

In the TNM system, each letter is given a number (and sometimes another letter) to show how advanced the cancer is. For example, T1 means the tumour is 1 cm or smaller, while T4 means the tumour is more than 7 cm, or has spread into nearby organs, or there are 2 or more separate tumours in the same lung.

stage 1	The cancer is no bigger than 4 cm and hasn't spread outside the lung or to any lymph nodes.	early
stages 2–3	The cancer can be any size and may have spread to nearby lymph nodes. It may also be growing into other parts of the lung, the airway or surrounding areas outside the lung. It has not spread to another part of the body.	locally advanced
stage 4	The cancer can be any size. It may have spread to lymph nodes and either to the other lung, to fluid in the pleura around the lungs, fluid around the heart, or to another part of the body such as the liver, bones or brain.	advanced

Staging SCLC

Sometimes, SCLC is staged using a 2-stage system that classifies the cancer as either limited disease or extensive disease.

limited disease (stages 1–3)	Cancer is usually only on one side of the chest and in one part of the lung; nearby lymph nodes may also be affected.
extensive disease (stage 4)	Cancer has spread widely throughout the lung, to the other lung, or to other parts of 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's not possible for anyone to predict exactly how the disease will respond to treatment. 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 or vape.

Discussing your prognosis and thinking about the future can be challenging and stressful. It's important to know that although some 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 well as the best and worst possible outcomes. This information can help you make treatment decisions.

As in most types of cancer, the outcomes of lung cancer treatment tend to be better when the cancer is found and treated early. Newer drug treatments such as immunotherapy and targeted therapy have given promising results in many people with advanced lung cancer, and are bringing hope for a longer, healthier life to those who have lung cancer that has spread.

For certain circumstances, these therapies are now being used for earlier-stage lung cancer. See pages 38–41 for more information.

Key points about diagnosing lung cancer

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

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
- MRI scan of the brain
- other imaging tests of the abdomen, pelvis and bones.

Staging and prognosis

- Your specialist will tell you the stage of the cancer, which describes how much cancer there is and whether it has spread to other parts of the body.
 - 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's 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 can 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 pages 12–13) 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's 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* fact sheet.

Should I join a clinical trial?

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'll 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.

► 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. All treatments recommended for you will be expected to be safe and effective.

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 (stages 1–3 SCLC), treatment may be given with the aim of making the cancer go away. This is called curative treatment.

Because lung cancer causes vague symptoms or even no symptoms in the early stages, many people are diagnosed when the cancer is advanced (stage 4 NSCLC, stage 4 SCLC or extensive disease). This means the cancer has spread outside the lung to other parts of the body.

When cancer is advanced, the aim 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 significantly shrink or control the cancer, helping people to live as fully and as comfortably as possible for many months or 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 44–54.

Treatment options by type of lung cancer and stage

Non-small cell lung cancer (NSCLC)

early (stage 1 or 2)	Usually treated with surgery. For stage 1, a type of high-dose targeted radiation therapy called stereotactic body radiation therapy (SBRT) may be used. Stage 2 is sometimes treated with chemotherapy, immunotherapy or targeted therapy as well as surgery. If surgery is not an option, stage 2 can be treated with chemotherapy and radiation therapy (chemoradiation), or radiation therapy on its own. Both stages are occasionally treated with tumour ablation.
locally advanced (stage 3)	Treatment will depend on where the cancer is in the lung, the number and location of lymph nodes with cancer, whether a surgeon can safely remove all the visible cancer, and a person's general health. Treatment may include one or more of the following: surgery, radiation therapy, chemotherapy, chemoradiation, immunotherapy and targeted therapy.
advanced (stage 4)	Usually treated with palliative drug treatment (targeted therapy, chemotherapy or immunotherapy), palliative radiation therapy, SBRT, or a combination of treatments. Treatment depends on the cancer cell type, how much the cancer has spread, the symptoms, the molecular test results, and a person's general health.

Small cell lung cancer (SCLC)

limited disease (stages 1–3)	Usually treated with chemoradiation, sometimes with immunotherapy afterwards. For stage 1, sometimes surgery may be used.
extensive disease (stage 4)	Usually treated with palliative chemotherapy, often combined with immunotherapy. To help control symptoms such as pain, 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, sometimes in combination with other cancer treatments. Some people with stage 3 NSCLC will be offered surgery, but surgery is not suitable for most people with advanced cancer. 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).

If there is fluid in the pleural cavity (called pleural effusion) that keeps returning, you may have surgery (pleurodesis), or have a catheter inserted, to control this. See pages 46–47 for more information.

Preparing for treatment

Quit smoking and vaping

If you smoke or vape, aim to quit before starting treatment.

Quitting smoking can improve your treatment results and reduce the impact of side effects. Research shows that quitting smoking before surgery reduces the risk of complications and can help you recover faster.

It's not always easy to quit, but support is available. Talk to your doctor, your nurse specialist, or call Quitline on 13 7848 (13 QUIT).

Eat well and exercise

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

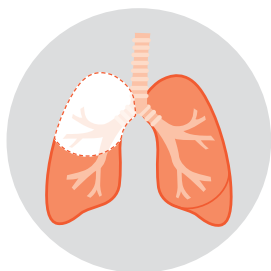
Preparing for treatment in this way is called prehabilitation. It can help you to cope with cancer treatment, recover more quickly and improve your quality of life.

A dietitian, exercise physiologist or physiotherapist can support you to make lifestyle changes. Ask your doctor for a referral.

Types of lung surgery

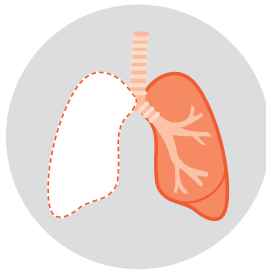


Surgery for lung cancer may remove all or part of a lung.



Lobectomy

This is the most common type of surgery for lung cancer. In a lobectomy, one of the lobes of the lung (about 30–50% of the lung) is 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 operation, 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 operation, a small part of the lobe is removed. Sometimes, a wedge resection may be considered. A wedge resection removes only a tiny piece of the lobe.

Removing lymph nodes

During surgery, the 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 helps the doctors decide whether you need further treatments after the surgery, such as chemotherapy, radiation therapy or immunotherapy. These are called adjuvant treatments. If lymph nodes were sampled and tested positive before the surgery, there may be treatment before the surgery, known as neoadjuvant treatment.

How the surgery is done

There are 3 main ways to perform surgery for lung cancer, and all 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). The surgeon will make 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 and fewer side effects compared to a thoracotomy (see below).

RATS – This is a new form of keyhole surgery known as robotic-assisted thoracoscopic surgery (RATS). After the surgeon makes a few small cuts in the chest wall, a robotic camera and arms are passed through the cuts. The surgeon uses the robot to move the instruments inside the body.

Thoracotomy – If a long cut is made between the ribs in the side of the chest, the operation is called a thoracotomy or open surgery. You'll need to stay in hospital for 3–7 days. Sometimes the surgeon may need to change from a VATS or RATS procedure to a thoracotomy during the surgery.



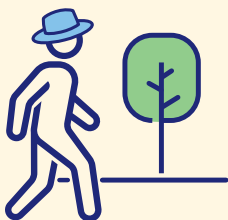
Many hospitals in Australia have programs to reduce the stress of surgery and improve your recovery. Known as enhanced recovery after surgery (ERAS) or fast-track surgical (FTS) programs, they provide information about what to expect each day after surgery. For information about preparing for treatment,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

What to expect after surgery



Exercises for breathlessness

A pulmonary (lung) rehabilitation program can help improve breathlessness and reduce the risk of a chest infection. A physiotherapist will show you some exercises. To continue rehabilitation after you leave hospital, talk to your surgeon or visit lungfoundation.com.au to find a program near you. 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/RATS or 6–12 weeks after thoracotomy to get back to your usual activities. Walking can help clear your lungs and speed up recovery. A physiotherapist can show you arm and shoulder exercises to improve mobility and strength.



Pain

You may have some pain after surgery, but this can usually be controlled. Ask for pain relief as needed. 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

Several tubes will be in place after surgery. They will be removed as you recover. A tube in a vein in your arm (intravenous drip) can provide fluid and medicines. Tubes in your chest drain fluid and help your lungs expand; and a tube in your bladder may check how much urine you pass.

► See our *Understanding Surgery* booklet for more information.

Radiation therapy

Also known as radiotherapy, radiation therapy uses radiation to target and kill cancer cells. This reduces the risk of the cancer coming back or spreading. It uses advanced technology to focus the radiation on the cancer and avoid the healthy parts of the body.

You may be given radiation therapy on its own, or after surgery or chemotherapy, or at the same time as chemotherapy (called chemoradiation). When you have it depends on the stage of the cancer.

Radiation therapy may be recommended to treat the primary tumour in the lung:

- if you are unable to have surgery for early-stage lung cancer
- if you chose not to have surgery
- where a surgery can't be safely done to treat locally advanced (stage 3) NSCLC, or to treat limited-disease SCLC
- after surgery, if there is a risk of microscopic cancer cells left behind.

You may be offered radiation therapy as palliative treatment. By controlling the cancer, it can help relieve pain, breathlessness or other symptoms (see pages 44–54).

For lung cancer, radiation is usually delivered in the form of x-ray beams from a machine outside the body called a linear accelerator. This is known as external beam radiation therapy (EBRT) and can be done as standard EBRT or stereotactic radiation therapy (see next page).

Standard EBRT – This is usually given once a day, Monday to Friday; each daily treatment lasts for a few minutes. How many treatments you need will depend on the aim of the treatment. To control symptoms, it's usually 1–2 weeks. Longer-term control is usually for 3–6 weeks.

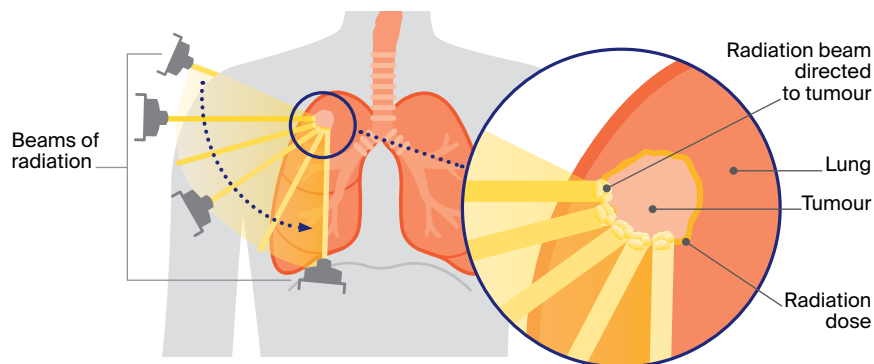
Stereotactic radiation therapy – Also called stereotactic body radiation therapy (SBRT) or stereotactic ablative body radiation (SABR), this can be given as a single dose or a small number of doses. It targets a tumour with a very high dose of radiation. SBRT cannot be used safely if tumours are very close to other organs, such as the windpipe.

Planning radiation therapy

Before treatment starts, you will have a planning session at the radiation therapy centre to work out the dose and position of the beams. During this session, you will have a CT scan to work out the area to be treated, and small marks will be put on your skin so the radiation therapists can make sure your body is in the same position for every treatment. You may have a four-dimensional CT scan to record any movement of the cancer as you breathe. You may also be shown some breathing exercises to help keep your breathing steady.

How radiation is done

External beam radiation uses a machine that gives high-dose radiation beams from different angles to precisely target the tumour.



Having radiation therapy

Each treatment day, a radiation therapist will help you lie in the position decided at the planning session. You will have an x-ray to check that the correct area is being treated. When the treatment is being delivered, you will be alone in the room, but the radiation therapists will be able to hear you and talk to you from the monitoring area. The radiation treatment itself takes only a few minutes, but a session may last about 20 minutes, depending on how complex the set-up process is.

Side effects of radiation therapy

Radiation therapy itself is painless, but it can affect some tissues and organs of the body. You may have some side effects during or after radiation therapy, depending on the dose, the number of treatments and the part of the chest treated. Most side effects are temporary and improve in the weeks after treatment.

Fatigue – Feeling tired is common after radiation therapy. You may need more rest or sleep, but gentle exercise and being physically active, if you are able to, is encouraged. See page 52 for tips on managing fatigue.

Discomfort when swallowing and heartburn – If the cancer is in the centre of the chest and near the oesophagus, you may develop heartburn and find swallowing uncomfortable. You may need to eat softer food and avoid hot drinks until you feel better. Your radiation oncologist may also prescribe medicine to control the pain until these side effects improve. Some patients may need a feeding tube from the nose into the stomach to support their nutrition, but this is rare.

Skin changes – Skin may become red and inflamed if the tumour is very close to the skin, but this is rare. Applying a moisturising cream and sun protection daily can help protect your skin.



If you have early-stage NSCLC and cannot have surgery, you may be treated with tumour ablation therapy instead of radiation therapy. This procedure uses high-energy radio waves (radiofrequency ablation), electromagnetic waves (microwave ablation) or cold (cryoablation) to destroy cancer cells.

Lung inflammation (pneumonitis) – Radiation therapy may cause inflammation of the lungs, called radiation pneumonitis. This may happen 2–12 months after the radiation has finished and usually doesn't need any treatment. Occasionally, it can cause shortness of breath and/or a cough, which may require treatment with steroids. Tell your radiation oncology team about any side effects you are concerned about, 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. The main types of drug therapies used to treat lung cancer are chemotherapy, immunotherapy and targeted therapy.

Having drug therapies

Some drug therapies are given through a vein (intravenously). You will probably have drug therapies as an outpatient, which means you go to a treatment centre, but don't stay overnight. Some types of targeted therapy come as tablets and can be taken by mouth (orally) at home.

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 (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).

Chemotherapy for lung cancer is often given as a combination of at least 2 drugs, but some people have treatment with one drug. Drugs are 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.

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 happen when these normal cells are damaged. 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 or dose adjustments if necessary.

Risk of infections – Chemotherapy drugs can lower the number of white blood cells that fight infections caused by bacteria. This means 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 higher. If possible, talk to your doctor about vaccinations to have before starting chemotherapy.

It's generally safe to have the flu and COVID-19 vaccines during chemotherapy. Keeping your hands and mouth clean and social distancing can also help prevent 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, making swallowing difficult. Your treatment team will explain how to prevent these issues and take care of your mouth.

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

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 extra medicines.

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

Targeted therapy

Targeted therapy 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 protein changes that are found in or on the surface of the cancer cells as a result of abnormal or mutated genes.

Targeted therapies are currently mostly available for people with NSCLC whose tumours have specific gene changes (see page 19) when the cancer is advanced or has come back after initial surgery or radiation therapy. Sometimes they are available for certain types of early-stage NSCLC.

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 and if targeted therapy is an option for you.

Side effects of targeted therapy

Targeted therapy is designed to be less harmful to healthy cells than chemotherapy, but it can still cause side effects. The side effects you may notice will depend on the type of targeted therapy you receive. Common side effects include a rash, fatigue, diarrhoea, nausea, body aches or swelling. Vomiting is a rare side effect.

In rare cases, targeted therapy 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.

▶ See our *Understanding Targeted Therapy* fact sheet.



Targeted therapy and immunotherapy for lung cancer are both changing rapidly, with many clinical trials currently underway in Australia. It is likely that new gene changes and proteins, as well as new types of these treatments, will continue to be discovered. Talk to your medical oncologist about any clinical trials that may be suitable for you (see page 26).

Immunotherapy

This is a type of drug treatment that uses the body's own immune system to fight cancer. The immunotherapy drugs usually used for lung cancer are called checkpoint inhibitors. These 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.

Checkpoint inhibitors are available for many people with advanced NSCLC and extensive-stage SCLC, as well as for people with certain types of stage 2 and 3 NSCLC and limited-stage SCLC.

Checkpoint inhibitors do not work for all types of lung cancer, but some people have good results. Ask your oncologist about molecular testing (see pages 19-20) and whether immunotherapy may be right for you.

Immunotherapy may be used alone, before or after surgery, after chemoradiation, or together with chemotherapy.

Tell your medical team if you have an autoimmune disease as this might mean this treatment is not suitable or needs special monitoring.

Side effects of immunotherapy

Immunotherapy can cause an inflammatory response in various parts of the body, which leads to different side effects depending on which part of the body becomes inflamed.

Common side effects include fatigue, rash, diarrhoea and joint pain. Most people have mild side effects that can be treated easily and usually improve. In rare cases, immunotherapy may cause pneumonitis (inflammation of the lungs), which can lead to breathing problems.

Let your treatment team know if you have new or worsening side effects. 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.

► See our *Understanding Immunotherapy* fact sheet.

Palliative treatment

If the cancer is advanced when it's first diagnosed or comes back after treatment (recurrence), your doctor will discuss palliative treatment for any symptoms caused by the cancer.

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 well and with few symptoms for many months or years.

Ways that symptoms may be relieved include:

- having palliative drug therapies (chemotherapy, immunotherapy and targeted therapy), radiation therapy and surgery to slow the spread of cancer and control symptoms such as pain or breathlessness
- draining any fluid to 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 and those of your family or carer. Your doctor may refer you to a palliative care service.

► 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 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

Choice of treatment

Treatment recommended will depend on the type of lung cancer and its stage, as well as your general fitness, lung function and whether the treatment is safe for you. It will also depend on what you want.

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 fatigue, pain when swallowing, heartburn, 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
 - targeted therapy – uses drugs that target specific features of cancer cells. Side effects may include rash, fatigue, diarrhoea, nausea, body aches or swelling
 - immunotherapy – uses drugs to help the immune system fight lung cancer. Side effects may include fatigue, rash, painful joints and diarrhoea.
-

Palliative treatment for advanced lung cancer

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

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

Managing symptoms

For many people with lung cancer, the main aim of treatment is to help control symptoms for as long as possible. This section explains treatments and ways to deal with the symptoms people often have with lung cancer. You may not have all the symptoms mentioned here.

Breathlessness

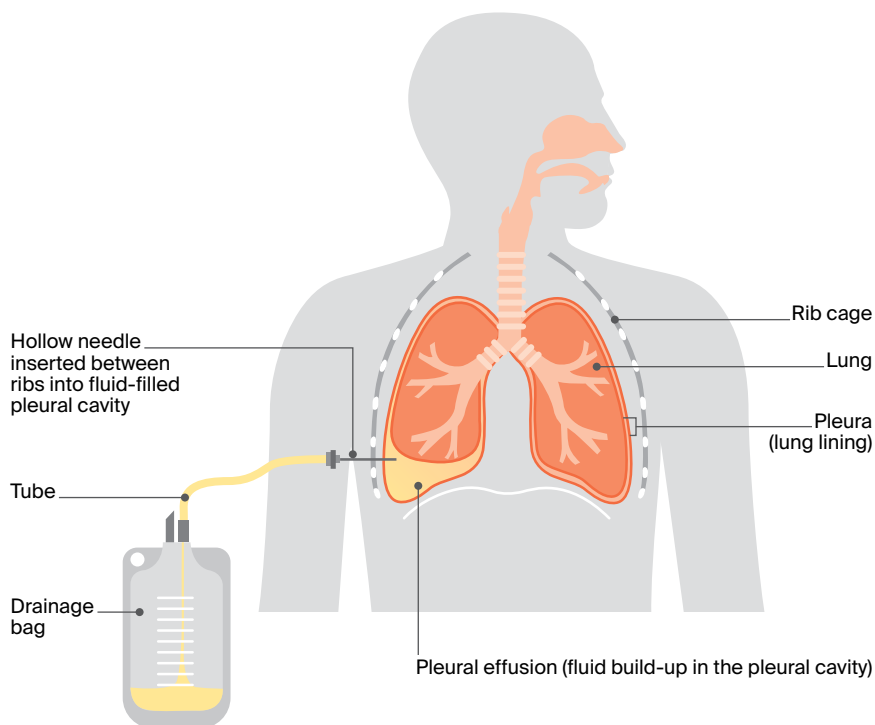
Many people with lung cancer have difficulty breathing before or after diagnosis. This shortness of breath is also called breathlessness or dyspnoea. It can happen for several reasons, including:

- the cancer itself and the lungs not working as well
- drop in fitness level due to less physical activity
- build-up of fluid (pleural effusion) in the pleural cavity, the space between the 2 layers of thin tissue covering the lung
- lung tissue changes after radiation or drug therapy (pneumonitis)
- other respiratory conditions, such as COPD (chronic obstructive pulmonary disease).

If the cancer is blocking a main airway, inserting a stent (a tiny tube) or using laser or radiation therapy may help open the airway and make breathing easier. You may also be referred to a pulmonary (lung) rehabilitation program to manage breathlessness. This program will include exercise, breathing techniques, ways to clear the airways and tips for conserving energy. Some people also use oxygen therapy at home.

If you smoke or vape, your doctor will recommend you quit and suggest ideas for how to do this. For ways to manage breathlessness at home, see pages 48–49.

Having a pleural tap



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.

Ways to control fluid around the lungs

If breathlessness is caused by pleural effusion, you may need to have surgery.

Types of procedures include:

- pleural tap to drain the fluid (see previous page)
- pleurodesis to stop fluid building up again (see below)
- an indwelling pleural catheter (see next page).

Pleurodesis

Pleurodesis is a way to close the pleural cavity. Your doctors might suggest 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 two 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 the surgeon will make one or more small cuts in the chest and pass a tiny video camera and operating instruments through.

After all fluid has been drained, the surgeon then injects some sterile talcum powder into the pleural cavity. This causes inflammation that helps stick 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. 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.

Next, sterile talcum powder mixed with salt water (a “slurry”) is injected through the tube into the pleural cavity. You may need to change positions to help the medicine cover the area. The process takes about an hour.

A talc slurry pleurodesis usually requires a stay in hospital of 2–3 days. After the procedure, some people feel a burning pain in the chest for 1–2 days, but this can be eased with medicines.

Indwelling pleural catheter

An indwelling pleural catheter is a small, soft tube used to drain fluid from around the lungs. It may be offered if fluid keeps building up in the pleural cavity and makes it hard to breathe, or if you are unable or do not want to have a pleurodesis. The catheter can be in place permanently, or until it’s no longer needed.

You will be given a local anaesthetic, then the doctor makes 2 small cuts in the chest wall and inserts the catheter into the pleural cavity. One end of the tube is inside the chest, and the other is coiled and fixed outside your skin with a small dressing.

The fluid can be drained at home. When fluid builds up and needs to be drained (usually once or twice a week), the catheter is connected to a small bottle. A community nurse can drain the fluid for you, or they can teach you, a family member or carer how to drain the catheter.



Lung Foundation Australia provides more information about living with lung cancer. Visit lungfoundation.com.au/lung-diseases/lung-cancer to find written information and videos. You can also contact their Lung Cancer Support Nurse by calling 1800 654 301.

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



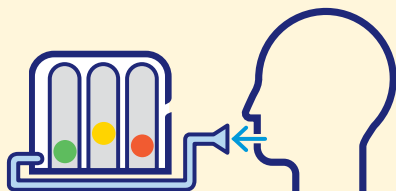
Let your doctor know if you feel breathless. Conditions such as anaemia, a lung infection or COPD may also make you feel short of breath, and these can often be treated.

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 healthcare team about equipment to manage breathlessness, such as:

- nebulisers, which turn liquid medicine into a mist you can inhale
- incentive spirometers, which you blow into to exercise your lungs
- oxygen concentrator to use at home
- mobility aids to use at home and for outings
- portable oxygen cylinders for outings.

Relax on a pillow



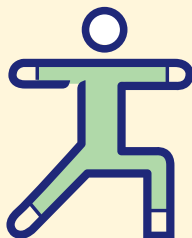
While seated at a table, rest your head and upper chest on a pillow. Bend from your hips and keep your back straight. This helps to relax your breathing muscles.

Ask about medicines



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

Modify your movement



Do gentle exercise to help you avoid losing strength and muscle. An exercise physiologist, physiotherapist or occupational therapist from your treatment centre can explain how to adjust your activities to improve breathlessness.

Create a breeze



Use a portable or handheld fan to direct a cool stream of air across your face if you feel short of breath when you are not active. Sitting by an open window or a floor fan can also help.

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 pain 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).



Managing pain

- Tell your doctor when you are in pain so they can help you manage it. A palliative care or pain specialist may be able to help with hard-to-manage pain.
- Keep track of your pain in a diary – note what the pain feels like, how intense it is on a scale of 0 to 10, 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.

Check with your doctor if you are safe to drive in this time.

- Take pain medicine 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 caused by pain medicines.
 - Learn 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 for more tips.

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 trouble swallowing, being breathless, or feeling sad (see page 57).

Weight loss can affect how your body responds to cancer treatment, your risk of infection, and how quickly you recover. This can happen to anyone, no matter your size. Eating well will help you cope better with 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, use full-cream milk).
 - 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, because it's easier to swallow.
 - Eat salads or cold foods if hot food smells make you feel sick. Avoid fatty or sugary foods if these make you feel nauseous.
 - Add ice-cream or fruit to a drink to increase kilojoules.
 - Eat more of your favourite foods – follow your cravings.
 - See a dietitian for more tips on what to eat and drink – they can suggest small changes to your diet or using protein drinks or nutritional supplements to help you stay well nourished. To find a dietitian, visit dietitiansaustralia.org.au.
- See our *Nutrition for People Living with Cancer* booklet for more tips on staying well nourished.

Fatigue

It's common to feel very tired during or after treatment, and you may not have the energy for day-to-day activities. Cancer-related fatigue is different from tiredness, as it may not go away with rest or sleep. You may also lose interest in things that you usually enjoy doing, or have trouble concentrating 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 it may be a side effect of drug therapies 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 or mask can help at these times.
- Accept offers of help from family and friends.
- Ask your doctor about what sort of exercise would be suitable. An exercise physiologist or physiotherapist can help with safe and appropriate exercise plans.
- Get a referral to an occupational therapist for help with relaxation techniques, breathing exercises and ways to conserve your energy.
- Consider acupuncture – some people find it helps with cancer-related fatigue.
- Say no to things you really don't feel like doing.
- ▶ See our *Understanding 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 your mood. Pain, breathlessness, anxiety, depression and some medicines can make it hard to 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 are feeling 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.
- Avoid alcohol, caffeine, nicotine and spicy food.
- Avoid watching television or looking at a computer, smartphone or tablet before bed, as the blue light may tell your body it's time to wake up.
- Follow a regular routine before bed and ensure the room is dark, quiet and a comfortable temperature.
- Try soothing music, a recording of rain sounds, or a relaxation recording.
- ▶ Listen to our "Sleep and Cancer" podcast episode for more tips and our *Finding Calm During Cancer* podcast series for a relaxing sleep track.

Key points about managing symptoms

Shortness of breath

Breathlessness can be managed with:

- surgical procedures – including pleural tap to drain fluid, pleurodesis to stop fluid building up again, 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 strategies – such as using a handheld fan, sleeping upright, gentle exercise, positioning pillows and relaxation techniques.

Pain

Pain can be managed with:

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

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 looking at 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 cancerconnect.org.au.

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 Connect on 13 11 20.

► See our *Cancer and Your Finances* and *Cancer, Work and 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 those close to you.

► See our *Emotions and Cancer* booklet.

Sex life – Cancer can affect your sex life 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 *Sex, 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's 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 and talk to your healthcare team about any concerns. Your family and friends may also need time to adjust. They might benefit from reading this booklet.

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. You can also call Cancer Connect on 13 11 20 to find out more about 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

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. For 24-hour crisis support, call Lifeline 13 11 14 or visit 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. This is sometimes called “scananxiety”. Talk to your treatment team or call Cancer Connect on 13 11 20 if you are finding it hard to manage this anxiety.

Between follow-up appointments, let your nurse or 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 Connect on 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.

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.

Cancer Council – You can call Cancer Connect on 13 11 20 or visit cancerconnect.org.au 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, friends 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. You can also call Cancer Connect on 13 11 20 or visit cancerconnect.org.au.

“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 Connect by Cancer Council



Call 13 11 20 to talk to a qualified professional. We can answer 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 40 types of cancer, as well as treatments, emotional and practical issues, and recovery. Call 13 11 20 or visit cancerconnect.org.au.

Legal and financial support



If you need advice on legal or financial issues, we may be able to refer you to appropriate professionals. These services may be free for people who can't afford to pay. Financial assistance may also be available. To find out more, call Cancer Connect on 13 11 20.

Practical help



Cancer Connect can help you find ways to manage the practical impacts of cancer. This can include connecting you with services, such as accommodation and transport services.

Peer support services



You might find it helpful to share your thoughts and experiences with other people affected by cancer. We can link you with individuals or support groups by phone, in person, or online. Call 13 11 20 or visit 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 Connect	cancerconnect.org.au
Cancer Council Online Community	cancercouncil.com.au/OC
Cancer Council podcasts	cancercouncil.com.au/podcasts
Guides to Best Cancer Care	cancer.org.au/cancercareguides
Australian Clinical Trials	australianclinicaltrials.gov.au
Cancer Australia	canceraustralia.gov.au
Carer Gateway	carergateway.gov.au
eviQ (cancer treatment information)	eviQ.org.au
Department of Health, Disability and Ageing	health.gov.au
Healthdirect Australia	healthdirect.gov.au
Lung Foundation Australia	lungfoundation.com.au
Palliative Care Australia	palliativecare.org.au
Radiation Oncology: Targeting Cancer	targetingcancer.com.au
Services Australia (including Centrelink and Medicare)	servicesaustralia.gov.au
Thoracic Oncology Group Australasia	thoraciconcology.org.au

International

American Cancer Society	cancer.org
Cancer Research UK	cancerresearchuk.org
Macmillan Cancer Support (UK)	macmillan.org.uk

Question checklist

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.

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 often 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

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 (secondary or metastasis).

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 it.

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 use is now banned in Australia because the fibres can cause serious illness.

benign

Not cancerous or malignant.

biopsy

The removal of a sample of cells or 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.

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.

diaphragm

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

dyspnoea

See breathlessness.

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's 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.

genes

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

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.

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 lumps of tissue that collect and destroy bacteria and viruses.

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 (lymph glands).

metastasis (plural: metastases)

Cancer that has spread from a primary cancer located in another part of the body. May also be called secondary or advanced cancer.

molecular test

Test that looks for changes in genes involved in cancer.

MRI scan

Magnetic resonance imaging scan. A scan that 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.

non-small cell lung cancer (NSCLC)

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

palliative treatment

Medical treatment for people with advanced cancer to help them manage pain and other physical and emotional symptoms. Treatment may include chemotherapy.

parietal pleura

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

PET-CT scan

Positron emission tomography scan combined with CT scan. In a PET scan, a person is injected with a small amount of radioactive solution. This makes cancerous areas show up brighter on the 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 excess fluid between the 2 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 excess 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 build-up.

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.

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 known as radiotherapy.

robotic-assisted thoracoscopic surgery (RATS)

Keyhole surgery performed through several small cuts in the chest, using a robotic camera and arms. See also thoracoscopy.

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 two 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 known as stereotactic ablative body radiation therapy (SABR).

systemic treatment

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

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 RATS and 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 air inhaled 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).

video-assisted thoroscopic surgery (VATS)

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

visceral pleura

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

wedge resection

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

Can't find a word here?

For more cancer-related words, visit connect.cancer.org.au/glossary.

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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.

The right support.



Cancer is never one story.
Every diagnosis, every person,
and every path is different. You
don't have to figure it out alone.

Cancer Connect can help you find
the information and support that
are right for you.

You can explore trusted information
on our Cancer Connect website at your
own pace, or call 13 11 20 to talk to our
qualified professionals. We will listen to
your concerns, answer your questions,
and connect you with support.

Wherever you are on your path,
Cancer Connect can help make the
next step feel clearer.

Right when you need it.



Call 13 11 20



Visit cancerconnect.org.au



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

*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,
call **Cancer Connect 13 11 20**
or visit **cancerconnect.org.au**

Cancer Council ACT
actcancer.org

Cancer Council Queensland
cancerqld.org.au

Cancer Council Victoria
cancervic.org.au

Cancer Council NSW
cancercouncil.com.au

Cancer Council SA
cancersa.org.au

Cancer Council WA
cancerwa.asn.au

Cancer Council NT
cancer.org.au/nt

Cancer Council Tasmania
cancer.org.au/tas

Cancer Council Australia
cancer.org.au

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To support Cancer Council, call 13 11 20 or visit cancerconnect.org.au.*