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## Lung cancer

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### Summary

- Over 2,370 Victorians are diagnosed with lung cancer every year.
  - Most lung cancers are caused by cigarette smoking.
  - There are different types of lung cancer, depending on which cells are affected.
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The lungs are two large spongy organs located inside the chest cavity. Air is breathed into the trachea (windpipe) and moves down two tubes called bronchi, each going to a lung. These tubes divide into bronchioles and then into tiny air sacs called alveoli. Lung cancers usually start in the cells lining the airways. There are different types of lung cancer, depending on which cells are affected.

Over 2,340 Victorians are diagnosed with lung cancer every year. Lung cancer occurs most often in adults between the ages of 40 and 70 who have smoked cigarettes for at least 20 years. The cause is not known in all cases. However, up to nine out of 10 lung cancers are caused by smoking. Lung cancer is the most common cause of death from cancer in Australia.

Chronic exposure to second-hand smoke, such as living with someone who smokes, is called 'passive smoking'. This is thought to increase a non-smoker's risk of lung cancer by about 30 per cent.

### Different types of lung cancer

A cancer that starts in the cells lining an organ is known as a carcinoma. There are different types of lung cancer, depending on which cells are affected. The two main types are:

- Small cell carcinoma or 'oat cell' carcinoma, named after its cell shape. Around 15 per cent of lung cancers are small cell carcinomas. This type of cancer spreads early, shows few early symptoms and is strongly linked with cigarette smoking
- Non-small cell carcinoma – these cancers affect the cells that line the main bronchi (airway passages into the lungs).

### Different types of non-small cell cancer

Some of the different types of non-small cell cancer include:

- squamous cell carcinoma – generally discovered earlier than other lung cancers and has the best outcome after treatment
- adenocarcinoma – now the most common type in both men and women. Its rise may be related to changing patterns of smoking, including the use of filtered cigarettes
- large cell carcinoma – named for its large, rounded cells visible under the microscope. It is sometimes known as 'undifferentiated carcinoma'
- bronchiolo-alveolar cell carcinoma – one of the less common types of cancer.

Sometimes, it is not possible to tell which type someone has because when the cells are looked at under a microscope, they are not developed enough.

### Lung cancer in non-smokers

A small percentage of non-smokers develop lung cancer even though they have never smoked and are rarely exposed to smoky environments. Anecdotal evidence among cancer specialists suggests that non-smoking women are about two or three times more likely to develop lung cancer than non-smoking men. The reason for this is unclear.

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Non-smokers who develop lung cancer may experience delays in diagnosis. Since lung cancer is strongly associated with cigarette smoking, a doctor may initially misdiagnose a non-smoker's symptoms as asthma or some other type of respiratory illness.

### **Non-tobacco risk factors for lung cancer**

Cancer is a complex disease caused by a mix of genetic and environmental factors. Apart from passive smoking, some of the factors that may increase the risk of lung cancer in non-smokers include:

- gender – non-smoking women seem to be at increased risk compared to non-smoking men. Researchers suggest that sex hormones may play a role
- smog – air pollution contains many cancer-causing agents (carcinogens)
- wood smoke – exposure to wood smoke for several hours every day (for example, burning wood for heating and cooking) can cause lung cancer in non-smokers. Wood smoke contains many of the carcinogens found in tobacco smoke
- asbestos – people who worked with asbestos are about seven times more likely to develop lung cancer than the rest of the population. The most common type of cancer caused by asbestos exposure is mesothelioma, which grows in the membrane sac (pleura) that encases the lungs
- workplace carcinogens – exposure to chemicals found in some workplaces can increase the risk of lung cancer. Known culprits include substances such as arsenic, radon (a radioactive gas formed from uranium), industrial talcum powder and coal products
- marijuana – because marijuana is an illegal drug, it is difficult for researchers to study its effects on users. It is also hard to isolate the carcinogenic effects of marijuana, since many people who use the drug also smoke cigarettes. However, some studies suggest that regular marijuana use is a significant risk factor in the development of lung cancer
- lung inflammation – certain diseases of the lung, such as pneumonia, can scar the lung tissue and increase the risk of lung cancer
- diet – studies show that poor nutrition is a significant factor in the development of certain cancers. For example, people who have too little or too much vitamin A seem to be at increased risk of developing lung cancer
- genetics – some research has found that people who have a close relative with early-onset lung cancer are more likely to develop the disease themselves. Non-smokers with early-onset lung cancer also seem to pass on an increased risk of the disease to their children. However, since a family shares the same environment as well as the same genes, it is difficult to say with certainty that genes are the sole cause. Researchers have discovered that some people inherit genes that reduce the body's ability to break down and eliminate carcinogens. Compared to the general population, people with these genes who are exposed to environmental carcinogens may be at increased risk of developing lung cancer or other types of cancer.

### **Symptoms of lung cancer**

Common symptoms of lung cancer include:

- persistent cough or a new or changed wheeze (or both)
- breathlessness
- blood-streaked phlegm (mucus)
- pains in the chest when coughing or taking a deep breath
- recurring pneumonia or chest infections
- recurring bronchitis
- excessive tiredness (fatigue)
- unexplained weight loss.

Less common symptoms can include:

- hoarse voice
- difficulty swallowing
- swelling of the face or neck

- pleural effusion – fluid around the lungs causing shortness of breath
- changes in the shape of your fingers and nails known as 'finger clubbing'.

All of these symptoms can be caused by other diseases apart from lung cancer.

### **Diagnosis of lung cancer**

Lung cancer is diagnosed using a number of tests, which may include:

- chest X-rays – cancers as small as one centimetre can be spotted on X-rays
- sputum cytology – a sample of sputum (phlegm) is examined under a microscope to check for abnormal cells
- bronchoscopy – a flexible tube is inserted through the mouth or nose and down the trachea (windpipe), allowing the doctor to look at the lung tissue and take a small sample of tissue and phlegm
- fine needle aspiration – a small sample of tissue is removed using a needle inserted through the chest wall
- mediastinoscopy – a flexible tube is inserted into a cut in the neck and down to the lymph nodes to check for cancer cells in the lymph nodes
- video-assisted thoracoscopic surgery – instruments similar to bronchoscopes are inserted into the chest wall under general anaesthetic and tissue samples may be taken
- computed tomography (CT) scan – a specialised x-ray taken from many different angles, to build a three-dimensional picture of your body
- fluoro-deoxy glucose (FDG) positron emission tomography (PET) scan – used in diagnosis and staging of lung cancer. This test involves having an injection of a small amount of radioactive material. Using the signals from this radioactive injection, a scanner can build up a picture of the body
- other tests – including bone scans, to see if the cancer has spread to other parts of the body.

Test results can take a few days to come back. It is very natural to feel anxious waiting to get your results. It can help to talk to a close friend or relative about how you are feeling. You can also contact the Cancer Council and speak with a cancer nurse.

### **Treatment of lung cancer**

Lung cancer is divided into stages according to its spread. This helps medical staff to decide on appropriate treatments. For some people, several treatments are used together to get the best results.

Treatment options include:

- surgery – to remove the affected part of the lung (lobectomy) or an entire lung (pneumonectomy). This offers the best chance of cure if the cancer has not spread beyond the lungs
- radiotherapy – the use of x-rays to target and kill cancer cells. Radiotherapy may be used against some early stage lung cancers and to stop cancer in the lymph nodes from spreading further. Prophylactic brain radiotherapy is often offered to people with small cell lung cancer to reduce the risk of their lung cancer spreading to their brain
- chemotherapy – anti-cancer drugs are given to stop cancer cells from multiplying. This treatment is most effective for small cell carcinoma
- targeted therapy (biological agents) – use of small molecules, often in tablet form, that may be used after chemotherapy
- clinical trials – participation in a clinical trial that investigates the safety and effectiveness of new medications may be offered
- complementary and alternative therapies – it's common for people with cancer to seek out complementary or alternative treatments. When used alongside your conventional cancer treatment, some of these therapies can make you feel better and improve quality of life. Others may not be so helpful and in some cases may be harmful. Cancer Council Victoria provides information on complementary and alternative cancer therapies.

### **When a cure isn't possible**

As with most cancers, the results are best if the cancer is diagnosed in its earliest stages. However, some lung cancers aren't diagnosed until they are quite advanced. This means you cannot cure the cancer, but you may be

able to help control its symptoms.

This is known as 'palliative care', which may involve:

- radiotherapy and chemotherapy – to help control the cancer
- medications – including pain relievers and anti-sickness drugs
- surgery – to remove any blockages in the airways caused by the cancer or to seal bleeding blood vessels
- quit smoking programs – depending on their disease status, people diagnosed with cancer have seen benefits ranging from increased longevity (length of life) and improved quality of life, once they quit smoking.

### **Caring for someone with cancer**

Caring for someone with cancer can be a difficult and emotional time. If you or someone you know is caring for someone with lung cancer, they may find it helpful to download and read some of the Cancer Council Victoria information booklets.

### **Where to get help**

- Your **GP (doctor)**
- **Cancer Council Victoria, Information and Support Service** Tel. **13 11 20**
- **Multilingual Cancer Information Line**, Victoria Tel. **13 14 50**
- **WeCan website** helps people affected by cancer find the information, resources and support services they may need following a diagnosis of cancer.
- **Australian Lung Foundation** Tel. **1800 654 301**
- **Quitline** Tel. **13 78 48**
- **Palliative Care Victoria** Tel. **(03) 9662 9644**

**This page has been produced in consultation with and approved by:**

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