

LUNG CANCER

1. Overview
 2. What is lung cancer?
 3. What is the prevalence of lung cancer?
 4. What are the main types of lung cancer?
 5. What are the risk factors?
 6. What are the signs and symptoms of lung cancer?
 7. How is lung cancer diagnosed?
 8. What are the available treatment options?
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1. Overview

Lung cancer is the most common and most deadly form of cancer in the world: it accounts for 1.52 million new cancer cases annually and because of its poor prognosis, 1.31 million deaths each year are attributable to lung cancer.¹ Overall lung cancer is the cause of nearly 30% of all cancer deaths.² Thirteen percent of all new cases of cancer are lung cancers³ and smoking is attributed as the main cause in 90% of these cases.²

2. What is lung cancer?

Lung cancer, or bronchogenic carcinoma, is the term used to describe growth of abnormal cells lining the air passages inside the lung tissue. These cells divide and grow more rapidly than normal cells and combine to form a cluster or tumour.

3. What is the prevalence of lung cancer?

Lung cancer is the biggest cancer killer in the world, lung cancer incidence rates are higher in men than women with the highest overall prevalence seen in North America and Europe.⁴

Additionally:

- More than two-thirds of lung cancers are diagnosed at a late stage and only 7% of lung cancer patients survive for at least five years after diagnosis.²
- 8 in 10 lung cancer cases occur in people aged 60 and over.²
- Recent studies indicate that women are more susceptible to developing lung cancer than men, and women smokers are twice as likely to develop lung cancer than male smokers. Even among non-smokers, women's risk of developing lung cancer is higher than that of men.⁵

4. What are the main types of lung cancer?

There are two main types of lung cancer:

1. Small cell lung cancer (SCLC)

About 20% of all lung cancers are small cell.⁵ In this type, the cancerous cells are small cells in which the nucleus (the control centre of cells) dominates. SCLC is almost always caused by smoking and generally spreads quickly at an early stage. Due to its aggressive nature, there are only two stages of SCLC: limited disease and extensive disease, and prognosis is generally poor.

2. Non-small cell lung cancer (NSCLC)

The term 'non-small cell lung cancer' applies to the various types of bronchogenic carcinomas (those arising from the lining of the bronchi). NSCLC is the most common form of lung cancer and there are three main types:

- **Squamous-cell carcinoma (30-35%)⁶** – the most common type of lung cancer, which is often caused by smoking. It develops in the squamous cells that line the airways
- **Adenocarcinoma (25-35%)⁶** – develops within the mucus-producing cells in the lining of the airways
- **Large cell carcinoma (10%)⁶** – named after the large, rounded cells that are seen when examined microscopically. It is sometimes known as undifferentiated carcinoma

One of the main differences between SCLC and NSCLC is the rate of tumour growth. Unlike SCLC, NSCLC grows and spreads more slowly.

Prognosis for NSCLC is dependent on the stage of the disease:

- In early-stage NSCLC, surgery offers the greatest chance of cure for patients with this form of lung cancer; however, only 20% have operable disease at presentation⁶
- Stage III tumours can be cured in some cases, but cure rates are much lower than earlier-stage NSCLC⁶
- Patients with stage IV disease are rarely cured, and the goals of therapy are to extend and improve the quality of their life

5. What are the risk factors?

Cigarette smoking is the primary cause of most lung cancers⁷ with at least 50 carcinogens being identified in tobacco smoke. A causal association with lung cancer has also been shown for consumption of cigars, cigarillos, pipes, bidis and water pipes.

Other causative agents include: prolonged contact with asbestos, radon gas or certain other chemicals.

6. What are the signs and symptoms of lung cancer?

The signs and symptoms of lung cancer may take many years to appear and are often confused with symptoms of less serious conditions such as flu or bronchitis. Common signs and symptoms include:

- A chronic, worsening cough
- Constant chest pain
- Coughing up blood (haemoptosis)
- Shortness of breath, wheezing or hoarseness
- Repeated chest infections, such as pneumonia or bronchitis
- Swelling of the neck and face
- Loss of appetite or weight loss
- Fatigue

Other signs and symptoms may be detected if the cancer metastasises. Depending on which organs are affected, these can include headaches, general weakness, pain, bone fractures, bleeding or blood clots.

7. How is lung cancer diagnosed?

A wide range of diagnostic procedures are used to diagnose lung cancer. These include:

Imaging studies

X-rays, ultrasound, CAT (computerised axial tomography) scans, MRIs (magnetic resonance imaging), PET scans (positron emission tomography) and bone scans.

Sputum tests

Samples of sputum are checked for cancer cells.

Blood tests

Baseline blood tests, which include renal and liver function tests, calcium and lactate dehydrogenase (LDH) levels, which can indicate the existence and severity of acute or chronic tissue damage.

Biopsy

Cells or tissues are removed from the lungs and examined microscopically to make a definitive diagnosis of cancer. If the cells are cancerous, they may be studied further to detect the rate of growth and extent of the cancer. The most common biopsy techniques are:

Bronchoscopy – A bronchoscope (thin viewing instrument) is inserted orally into the windpipe to examine the bronchi and lungs. In some cases, it can take photographs as well as perform a biopsy function. If it is necessary to check the tissues and lymph nodes surrounding the trachea, the test is called a mediastinoscopy.

Thoracentesis – Following the application of a local anaesthetic, a small amount of the fluid that surrounds the lung is removed.

Testing will also detect the cancer stage. Low-grade cells are slower to divide and the cancer is generally less aggressive. High-grade cells divide more quickly and the cancer is more likely to spread.

8. What are the available treatment options for NSCLC?

In general, there are three types of treatment used in the management of lung cancer that can be used separately or in combination. These are surgery, radiotherapy and chemotherapy. However, SCLC and NSCLC behave and respond to treatment quite differently. To determine the most appropriate treatment, cancers are ‘staged’ to determine the severity of a patient’s disease.

Treatment options for NSCLC

The different stages of NSCLC are treated in different ways; however, surgery offers the best patient outcome for those with early-stage NSCLC.⁶

Stage	Extent	Treatment
Stage 1	Cancer is present only in one part of the lung	The tumour can often be removed with surgery. Chemotherapy is sometimes used after surgery (adjuvant chemotherapy) to reduce recurrence. Chemotherapy may sometimes be given before surgery and/or radiotherapy to shrink the tumour. This is known as neo-adjuvant chemotherapy.
Stage 2	Cancer has spread to nearby lymph nodes or nearby tissues, e.g. chest wall	It may also be possible to remove stage 2 NSCLC with surgery, and chemotherapy is often given following surgery or radiotherapy to reduce the risk of recurrence.
Stage III	Cancer has spread more extensively within the chest and, generally, to the major lymph nodes	Although surgery may be considered as an option at this stage, this is often not possible because the cancer may have spread too far. Chemotherapy, on its own or combined with radiotherapy, may be given before an operation. If surgery is not possible, radiotherapy can be given instead. In some cases, chemotherapy given on its own, or in combination with radiotherapy, will be the only treatment used. For some patients with locally advanced or metastatic non-small cell lung cancer (NSCLC), who fail on chemotherapy, a newer treatment, such as erlotinib may be used.
Stage IV	Cancer has spread to other parts of the body, e.g. to the liver or bones (metastasis)	The aim is to control symptoms and maintain a good quality of life for as long as possible. Radiotherapy may be used to shrink the cancer and reduce symptoms such as pain. Chemotherapy may be given before or after radiotherapy and may shrink the cancer and improve quality of life for some people. For some patients with locally advanced or metastatic non-small cell lung cancer (NSCLC), who fail on chemotherapy, a newer treatment, such as erlotinib may be used.

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