

# Pathophysiology of Lungs Cancer

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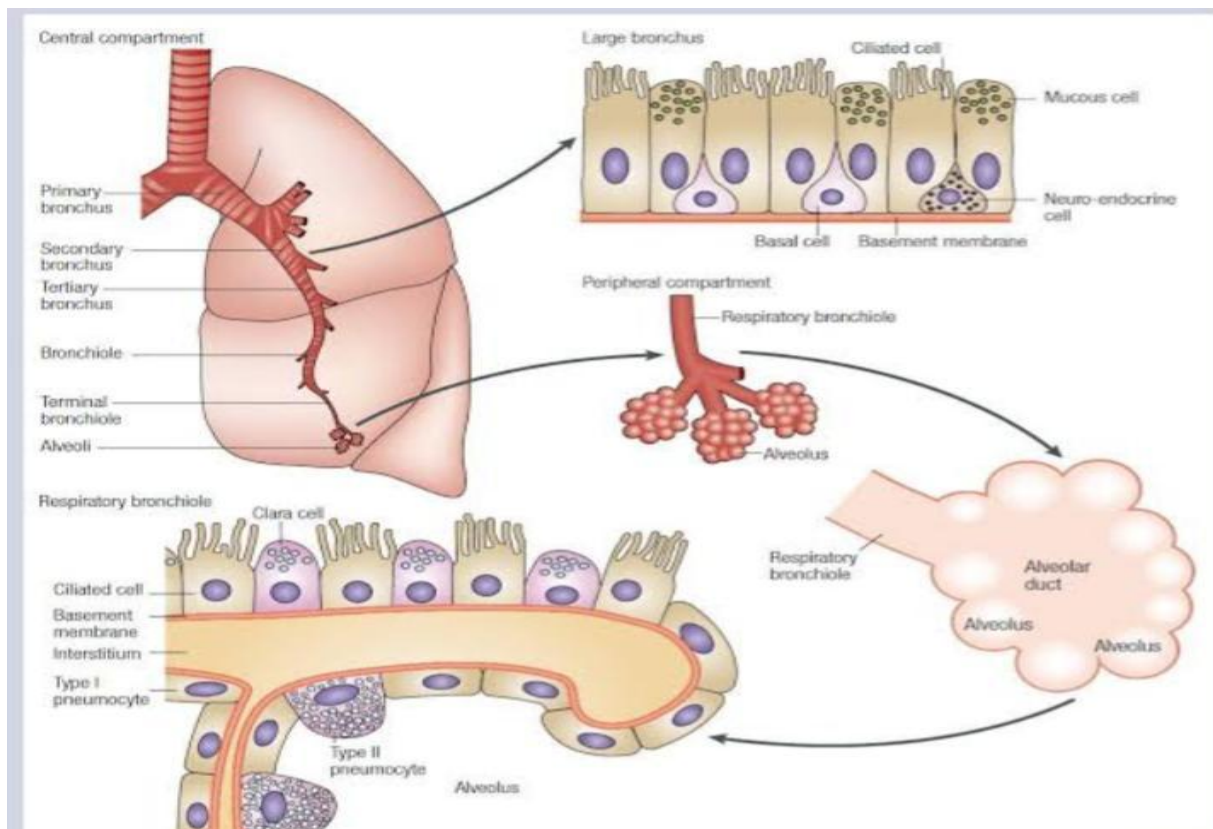
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**Abstract:** *The pathophysiology of lung cancer is often described as very intricate and not completely understood; however, research efforts have progressed, and medical experts have better insight regarding the etiology and risk factors associated with the development of lung cancer. Researchers believe that repeated exposure to carcinogens, particularly cigarette smoke, leads to dysplasia of lung epithelium. If the exposure persists, it can cause genetic mutations and affect protein synthesis. As a result, there is a disruption in the cell cycle, which promotes carcinogenesis. The most common genetic mutations responsible for small cell lung cancer development are MYC, BCL2, and p53. Mutations in epidermal growth factor receptor, KRAS, and anaplastic lymphoma kinase are mutually exclusive in patients with non-small cell lung cancer.*

**Keywords:** pathophysiology

## I. INTRODUCTION

Diagnosed with lung cancer have small-cell lung cancer (also called oat cell cancer). It's also almost exclusively found in smokers. It tends to grow more quickly than NSCLC. It often spreads to other parts of the body at an earlier stage. The frequency, risk factors, pathophysiology, diagnosis, and management of lung cancer are reviewed. An estimated



157,400 Americans died of lung cancer in 2001. Lung cancer is the second most frequent cancer in both men and women. The major risk factor for lung cancer is smoking, which accounts for 75-80% of lung cancer-related deaths. Lung cancers can be broadly classified into two forms, small-cell carcinomas and non-small-cell carcinomas. Non-

small-cell lung cancer is more common, accounting for up to 75% of lung cancers. Lung cancer is diagnosed by chest radiography, sputum cytology, bronchoscopy, needle biopsy, and other techniques. Surgery plays a major role in managing stage I and stage II non-small-cell lung cancer and may be used for stage III disease. Patients with stage IIIa disease may be surgical candidates, but involvement of mediastinal lymph nodes reduces the probability of survival. Adjuvant irradiation may reduce the rate of local recurrence but does not increase survival time. Adjuvant chemotherapy may confer a small survival-time advantage if the regimen includes cisplatin. Chemotherapy combined with radiation therapy may produce a survival advantage over irradiation alone.

**II. METHODS**

The study used bibliometrics to undertake a quantitative analysis of research output in the 24 leading countries in cancer research internationally on the basis of articles and reviews in the Web of Science (WoS) database.

Diagnostic method	Sensitivity (%)	Specificity (%)	Indication	Comments
Sputum cytology (at least three specimens)	Central tumors: 71 Peripheral tumors: < 50	99	Central tumor and hemoptysis	Noninvasive; further testing needed after negative result
Thoracentesis	80	> 90	Pleural effusion	—
Excisional biopsy of an accessible node	—	—	Palpable lymphadenopathy	—
Flexible bronchoscopy with or without transbronchial needle aspiration	Central tumors: 88 Peripheral tumors: 60 to 70	90	Central or peripheral tumor and mediastinal lymphadenopathy	Fluoroscopic or CT guidance; transbronchial needle aspiration improves sensitivity in peripheral tumors
Transthoracic needle aspiration	Peripheral tumors: 90	97	Peripheral tumor in nonsurgical candidates or when transbronchial needle aspiration is inconclusive	Fluoroscopic or CT guidance; the assistance of a cytopathologist improves diagnostic yield
Video-assisted thoracoscopy	—	—	Small peripheral tumors (< 2 cm in diameter), pleural tumors, or pleural effusions	May prevent the need for thoracotomy
Thoracotomy	—	—	Only clearly resectable tumors	Recommended for diagnosis and treatment of early non-small cell carcinoma

*CT = computed tomography.  
Information from reference 27.*

**How lung cancer spreads**

Lung cancer acts differently in different people. But when it spreads, it tends to go to the same places. First: lymph nodes in the center of the chest. It may also spread to lymph nodes in the lower neck.

**Lymph nodes are small clusters of immune system cells.**

During later stages, lung cancer may spread to more distant parts of the body, such as the liver, brain, or bones.

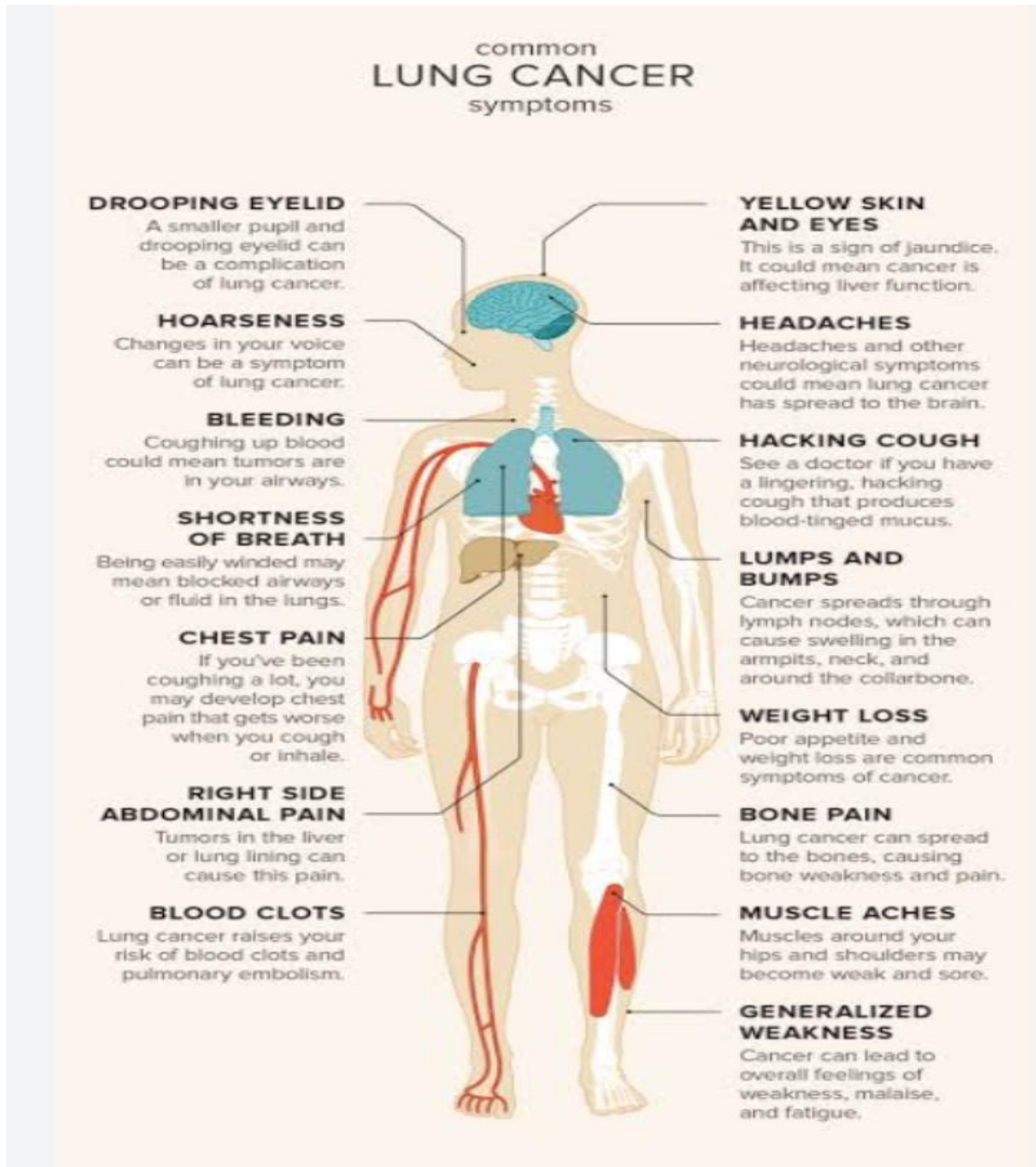
**Symptoms**

Lung cancer typically doesn't cause signs and symptoms in its earliest stages. Signs and symptoms of lung cancer typically occur when the disease is advanced.

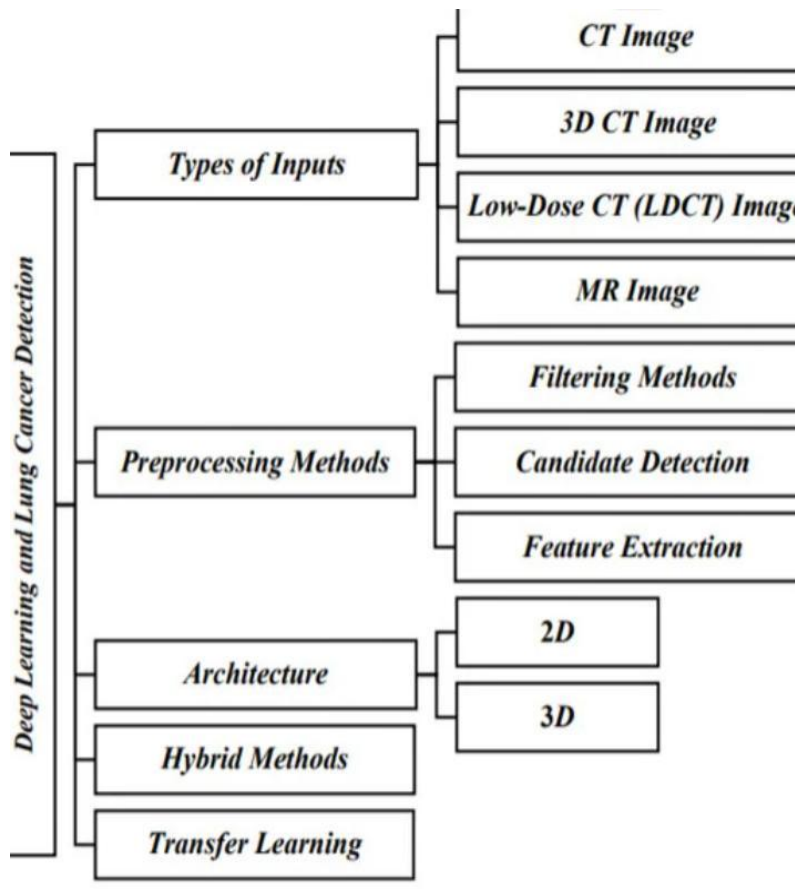
**Signs and symptoms of lung cancer may include:**

- A new cough that doesn't go away
- Coughing up blood, even a small amount

Shortness of breath  
Chest pain  
Hoarseness  
Losing weight without trying  
Bone pain  
Headache



**Diagnostic methods**



**Risk factors**

Smoking. Your risk of lung cancer increases with the number of cigarettes you smoke each day and the number of years you have smoked. Quitting at any age can significantly lower your risk of developing lung cancer.

Exposure to secondhand smoke. Even if you don't smoke, your risk of lung cancer increases if you're exposed to secondhand smoke.

Previous radiation therapy. If you've undergone radiation therapy to the chest for another type of cancer, you may have an increased risk of developing lung cancer.

Exposure to radon gas. Radon is produced by the natural breakdown of uranium in soil, rock and water that eventually becomes part of the air you breathe. Unsafe levels of radon can accumulate in any building, including homes.

Exposure to asbestos and other carcinogens. Workplace exposure to asbestos and other substances known to cause cancer — such as arsenic, chromium and nickel — can increase your risk of developing lung cancer, especially if you're a smoker.

Family history of lung cancer. People with a parent, sibling or child with lung cancer have an increased risk of the disease.

**Treatment**

**The main treatments for lung cancer include:**

- Surgery
- Chemotherapy
- Radiation therapy
- Immunotherapy
- Targeted therapy



However, about two-thirds Trusted Source of people with NSCLC and 97% Trusted Source of people with SCLC have advanced disease when they receive a diagnosis. Most widely used therapies for lung you cancer are surgery, chemotherapy, and radiation therapy. 6.1 Medical Treatment Chemotherapy and radiation therapy □ Chemotherapy and radiation may lead to a cure in a small number of patients. These therapies result in shrinking of the tumor and are known to prolong life for extended periods in most patients. □ Chemotherapy and radiation are very effective at relieving symptoms. □ Of all cases of advanced-stage lung cancer (spread outside the chest cavity), approximately 50%-60% of SCLC and 15%-A Pandi et al. Volume 4 (1), 2016, Page-907-914 912 IIIIIIIIIII © International Journal of Pharma Research and Health Sciences. All rights reserved 40% of NSCLC will go in to remission with chemotherapy. □ If relapse occurs, a different type of chemotherapy regimen may offer symptom relief and modest survival benefit. □ Chemotherapy uses chemicals that travel through the bloodstream. It affects both cancerous and healthy cells. This accounts for the many well-known side effects of chemotherapy, including nausea and vomiting, hair loss, skin problems, mouth sores, and fatigue. Radiation therapy does not affect cells throughout the body the way chemotherapy does. However, it does affect healthy tissues overlying or directly adjacent to the tumor. To a certain extent, the side effects of radiation depend on which part of the body is targeted with radiation.

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