



Saudi Lung Cancer Association  
المجموعة السعودية لسرطان الرئة



# Signs and Symptoms of Lung Cancer

Mohammed Zeitouni, MD, FCCP  
Consultant,  
Pulmonologist and Intensivist  
Department of Medicine  
King Faisal Specialist Hospital

# Lung cancer Epidemiology



Saudi Lung Cancer Association  
المجموعة السعودية لسرطان الرئة



- Lung cancer is the most common cancer worldwide, accounting for 1.3 million deaths annually.
- Lung cancer is the leading cause of cancer-related death
- It is the most preventable form of cancer
- **There are two major types of lung cancer:**
  1. Non-small cell lung cancer (87%)
  2. Small cell lung cancer (13%)

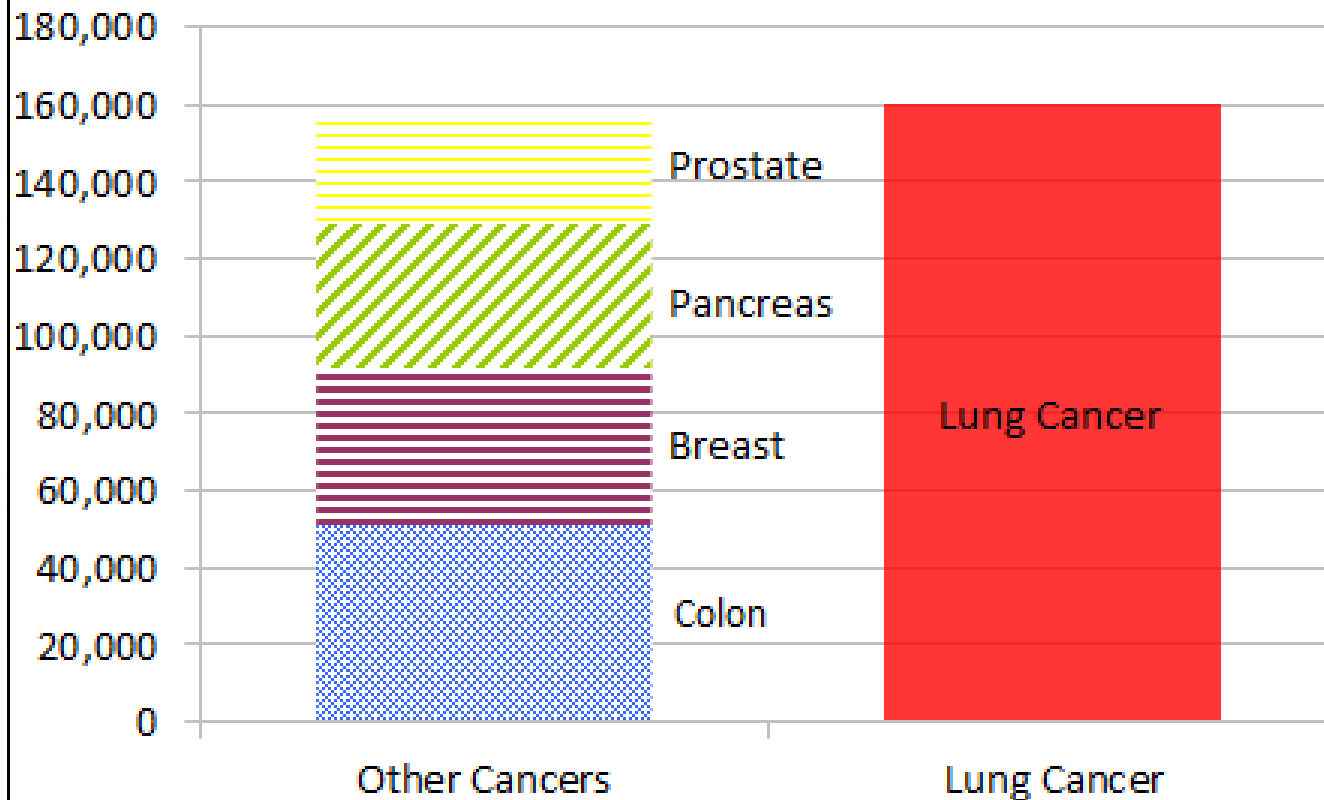


Saudi Lung Cancer Association  
الجمعية السعودية لسرطان الرئة

# Lung cancer Epidemiology



### Estimated Cancer Deaths by Site, 2012



Source: American Cancer Society. Cancer Facts & Figures 2012



Saudi Lung Cancer Association  
الجمعية السعودية لسرطان الرئة



# Lung cancer survival

- Lung cancer five-year survival rates average **16 %**
- Over half of people with lung cancer die within one year of being diagnosed
- **Survival** for non-small cell lung cancer NSCLC is directly related to **stage** at time of diagnosis
- Five-year survival ranges from >60% for stage I disease, to <5% for stage IV disease
- Even for early lung cancers (stage I), there is a relationship between **tumor size** and survival
- Early diagnosis increases overall **cure rate** and allows more **limited surgical resection** to achieve cure

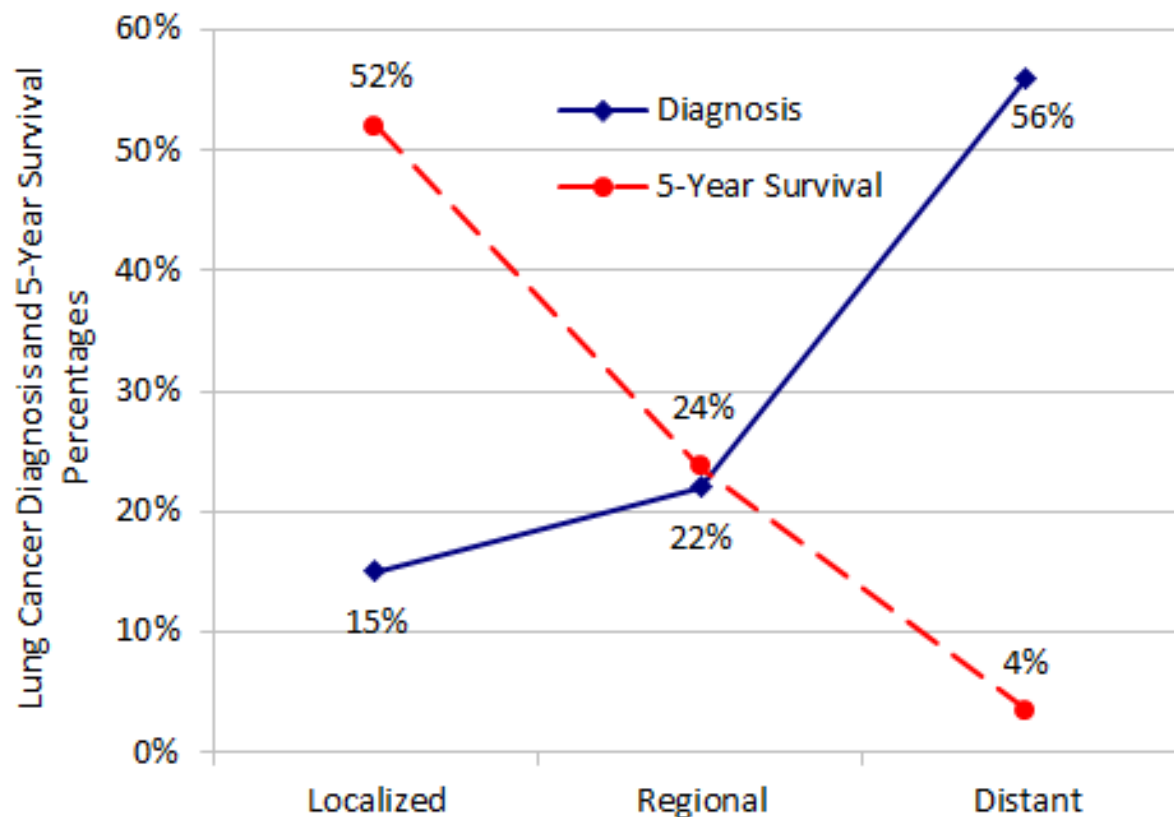


Saudi Lung Cancer Association  
الجمعية السعودية لسرطان الرئة

# Lung Cancer Survival by Stage



Lung Cancer Diagnosis and Survival By Stage, 2001-2007



Source: SEER Cancer Statistics Review, 1975-2008



Saudi Lung Cancer Association  
الجمعية السعودية لسرطان الرئة

# Lung Cancer Symptoms



- lungs have few specialized nerves (pain receptors)
- Symptoms are frequently **absent** until locally advanced or metastatic disease is present
- Symptoms vary depending on the type and location and size of the tumor.
- The majority (**75%**) of patients with lung cancer have **advanced local or metastatic disease at presentation**
- Many symptoms are **similar** to those of other **common illnesses**.





Saudi Lung Cancer Association  
المجموعة السعودية لسرطان الرئة

# Lung Cancer Symptoms



- **Early Stage:**
- **No signs! No symptoms!**





# Lung Cancer Symptoms

Saudi Lung Cancer Association  
المجموعة السعودية لسرطان الرئة



Symptoms result from:

- Local effects of the tumor
- Regional or distant spread
- Distant effects not related to metastases (paraneoplastic syndromes)
- Approximately three-fourths of patients have one or more symptoms at the time of diagnosis.







Saudi Lung Cancer Association  
المجموعة السعودية لسرطان الرئة

# Lung cancer symptoms

## Intrathoracic (Local) disease



- Restricted to the area where the cancer started with no signs of spread
- Cough: most common
- Blood in sputum (hemoptysis)
- Shortness of breath (dyspnea)
- Wheezing
- Chest Pain
- Pneumonia





# Intrathoracic (Local) disease

## Cough

Saudi Lung Cancer Association  
المجموعة السعودية لسرطان الرئة



- 50 to 75 percent of patients at presentation
- Most frequently in squamous and small cell carcinomas (central tumors)
- New onset (or change in character) of cough in a smoker or former smoker should raise suspicion that lung cancer could be present
- Bronchorrhea may be a feature of what is previously known as advanced “bronchoalveolar cell carcinoma”

**“If you have a persistent cough that lasts for over 3 weeks see your GP”**



# Intrathoracic (Local) disease

## Hemoptysis

Saudi Lung Cancer Association  
المجموعة السعودية لسرطان الرئة



- 25-30% of patients with lung cancer
- Bronchitis is the most common cause
- likelihood of lung cancer 3- 34% depending upon age and smoking history
- Hemoptysis in a smoker with normal chest radiograph: 5 %lung cancer on bronchoscopy



# Intrathoracic (Local) disease

## Chest Pain

Saudi Lung Cancer Association  
المجموعة السعودية لسرطان الرئة

- 20% of patients upon presentation
- Dull, aching, persistent pain from mediastinal, pleural, or chest wall extension
- Typically present on the same side of the chest as the primary tumor
- Presence of pain does not necessarily preclude resectability
- Obstructive pneumonitis or a pulmonary embolus related to a hypercoagulable state may be the cause of chest pain





# Intrathoracic (Local) disease

## Dyspnea

Saudi Lung Cancer Association  
المجموعة السعودية لسرطان الرئة



25% on presentation due to:

- Airway obstruction: extrinsic or intraluminal
- Obstructive pneumonitis or atelectasis
- Lymphangitic tumor spread
- Tumor or bland emboli
- Pneumothorax
- Localized wheeze: Partial obstruction of a bronchus



Saudi Lung Cancer Association  
المجموعة السعودية لسرطان الرئة

# Regionally advanced disease



Cancer has directly spread from where it started to nearby tissue or lymph nodes

- **Hoarseness**: tumors involving recurrent laryngeal nerve, causing unilateral vocal cord paresis (L>>R) with hoarseness and a bovine cough. Can be from Laryngeal cancer!
- **Stridor**: high pitched sound, usually heard while taking a breath  
Intrinsic or intraluminal narrowing of upper airways





Saudi Lung Cancer Association  
الجمعية السعودية لسرطان الرئة

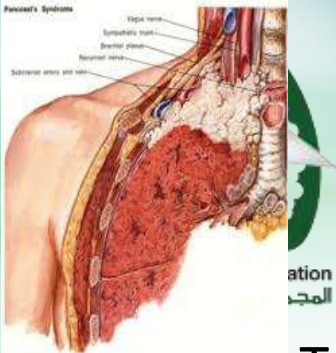
# Regionally advanced disease



- **Hemidiaphragmatic Paralysis** : Bronchial carcinoma can directly invade the phrenic nerve, causing ipsilateral paralysis of the hemidiaphragm
- **Dysphagia**: difficulty or pain in swallowing from involvement of the esophagus by tumor or mediastinal lymph nodes
- **Pleural or pericardial effusion** with tamponade and malignant dysrhythmias.

# Regionally advanced disease

## Pancoast tumor



- Tumor in the apex (the superior sulcus ) of the lung can erode the ribs and involve the lower part of the brachial plexus (C8, T1 and T2), causing severe pain in the shoulder and down the inner surface of the arm and atrophy of hand muscles
- NSCLC (typically squamous cell).Rarely SCLC
- The sympathetic ganglion can also be involved, producing Horner's syndrome.
- Ptosis
- Enophthalmos
- Miosis
- Anhidrosis







# Regionally advanced disease

## *Superior Vena Cava Syndrome*



- Obstruction of blood flow in the superior vena cava results in signs and symptoms of *Superior vena caval* (SVC) syndrome
- *SVC obstruction* causes shorten of breath, early morning headache, facial congestion and edema involving the upper limbs; the jugular and chest veins are distended
- The chest radiograph shows widening of the mediastinum or a right hilar mass
- SCLC is the most common cause





Saudi Lung Cancer Association  
المجموعة السعودية لسرطان الرئة

# Distant metastases

## Brain



Symptoms are similar to those with other tumors

- Headaches
- Vomiting
- Nausea
- Seizures
- Weakness
- Confusion
- Visual disturbances

SCLC: 20-30% of patients at presentation

Role for prophylactic cranial irradiation

NSCLC: adenocarcinoma and least with squamous cell carcinoma.

larger tumor size and the presence of node involvement



Saudi Lung Cancer Association  
المجموعة السعودية لسرطان الرئة

# Distant metastases



- **Bone**

Common. Bone pain and pathological fractures

- **Liver**

Uncommon(3%) early. Detected by liver enzyme abnormalities, CT or PET

- Abdominal pain (right side)
- Yellowing of the skin and eyes (jaundice)
- Fatigue
- Weight loss
- Nausea





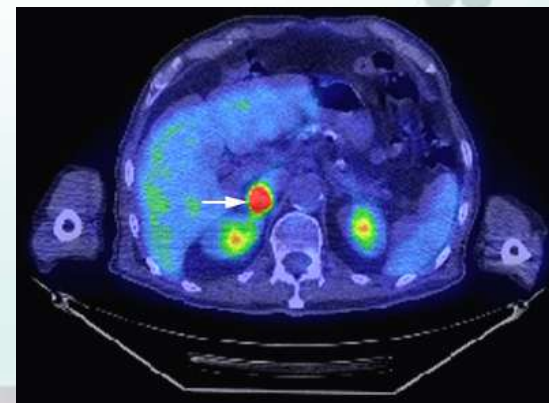
Saudi Lung Cancer Association  
المجموعة السعودية لسرطان الرئة

# Distant metastases

## Adrenal glands



- Very frequent (40%) post-mortem. Often asymptomatic
- Not all adrenal masses detected on staging scans represent metastasis. benign lesions (adenomas, nodular hyperplasia, hemorrhagic cysts) are common
- PET may be particularly useful in distinguishing a benign from malignant adrenal mass
- MRI consistent with a benign adenoma or a negative needle biopsy can exclude metastasis





Saudi Lung Cancer Association  
المجموعة السعودية لسرطان الرئة

# Paraneoplastic Syndromes



- Paraneoplastic Syndromes are remote effects of tumors that are not related to the direct invasion, obstruction, or metastasis





Saudi Lung Cancer Association  
المجموعة السعودية لسرطان الرئة

# Paraneoplastic Syndromes

## Hypercalcemia



- Symptoms of hypercalcemia include anorexia, nausea, vomiting, constipation, lethargy, polyuria, polydipsia, and dehydration
- Confusion, coma, renal failure and nephrocalcinosis are late manifestations
- Incidence 6% squamous cell carcinoma > adenocarcinoma > SCLC
- Poor prognostic factor usually in advanced disease (stage III or IV). Median survival of few months only



Saudi Lung Cancer Association  
المجموعة السعودية لسرطان الرئة

# Paraneoplastic Syndromes

## Hypercalcemia



- **Bony metastasis** and less commonly secretion of a parathyroid hormone-related protein (**PTHrP**), calcitriol or osteoclast activating factor
- Treatment with hydration and bisphosphonate for **symptomatic** patients who have serum calcium of 12 mg/dL (3 mmol/L) or higher





Saudi Lung Cancer Association  
المجموعة السعودية لسرطان الرئة

# Paraneoplastic Syndromes

## Hyponatremia



- 10% of patients with SCLC exhibit SIADH
- SCLC accounts for approximately 75% of all malignancy-related SIADH
- Symptoms include anorexia, nausea, and vomiting.
- Cerebral edema when onset of hyponatremia is rapid irritability, restlessness, personality changes, confusion, coma, seizures, and respiratory arrest
- Hyponatremia resolves within weeks of starting chemotherapy





Saudi Lung Cancer Association  
المجموعة السعودية لسرطان الرئة

# Paraneoplastic Syndromes

## Cushing's syndrome



- Ectopic production of adrenal corticotropin (ACTH)
- Common in SCLC (worse prognosis) and in carcinoid tumors of the lung
- Muscle weakness, weight loss, hypertension, hirsutism, and osteoporosis
- Hypokalemic alkalosis and hyperglycemia are usually present



Saudi Lung Cancer Association  
الجمعية السعودية لسرطان الرئة

# Paraneoplastic Syndromes

## Neuromuscular manifestations



Lung cancer (typically SCLC): most common cancer associated with Immune-mediated paraneoplastic neurologic syndromes

### Lambert-Eaton myasthenic syndrome (LEMS)

precede the diagnosis of SCLC >80% of cases by months-years

- cerebellar ataxia
- sensory neuropathy
- limbic encephalitis
- encephalomyelitis
- autonomic neuropathy
- Retinopathy
- Opsomyoclonus

A CT chest or PET is indicated in current or former smokers who have a suspected paraneoplastic neurologic syndrome



Saudi Lung Cancer Association  
المجموعة السعودية لسرطان الرئة

# Paraneoplastic Syndromes

## Neuromuscular manifestations



- **Dermatomyositis and polymyositis**: two distinct forms of **inflammatory myopathy**, both of which are manifested clinically by muscle weakness
- Can be the presenting symptom in patients with lung cancer or can develop after diagnosis.





Saudi Lung Cancer Association  
المجموعة السعودية لسرطان الرئة

# Paraneoplastic Syndromes

## Hypertrophic pulmonary osteoarthropathy HPOA



- 3% of all bronchial carcinomas, particularly **squamous**-cell carcinomas and **adenocarcinomas**.
- Symptoms: joint stiffness and severe pain in the wrists, ankles, knees and elbows with **clubbing** of the fingers
- X-rays show a characteristic proliferative periostitis at the distal ends of long bones
- Isotope bone scan or PET: diffuse uptake by the long bones
- It may regress after resection of the lung tumor.





Saudi Lung Cancer Association  
المجموعة السعودية لسرطان الرئة

# Paraneoplastic Syndromes

## Hematologic manifestations



- **Anemia** is frequent in patients with lung cancer and can contribute to fatigue and dyspnea
- **Leukocytosis/thrombocytosis**: 15% NSCLC bad prognosis
- Eosinophilia: rare
- Hypercoagulable disorders include:
  - **Trousseau's syndrome** (migratory superficial thrombophlebitis)
  - **DVT/PE**
  - **DIC**
  - **Thrombotic and Nonthrombotic microangiopathy**



Saudi Lung Cancer Association  
المجموعة السعودية لسرطان الرئة

# Paraneoplastic Syndromes

## Cancer cachexia or wasting syndrome



- lack of appetite
- weight loss
- weakness
- Feeling tired all the time





Saudi Lung Cancer Association  
المجموعة السعودية لسرطان الرئة

# Conclusion



- Early detection based on symptoms is difficult in Lung Cancer
- Symptoms often do not appear until the disease has spread
- When lung cancer is diagnosed early, it is a result of Screening or testing for unrelated conditions.
- Chest x-ray and CT scan should be done if lung cancer is suspected



Saudi Lung Cancer Association  
المجموعة السعودية لسرطان الرئة

# Conclusion



The clinical manifestations of lung cancer can be due to

- Intrathoracic Local effects of the tumor (cough, hemoptysis, dyspnea)
- Intrathoracic regional effects (hoarseness, stridor)
- Extrathoracic metastases (bone, brain, liver)
- Paraneoplastic phenomena (hypercalcemia, hyponatremia, Cushing's syndrome, hypercoagulability disorders, and various neurologic syndromes).

