

## Pulmonary Neoplasia

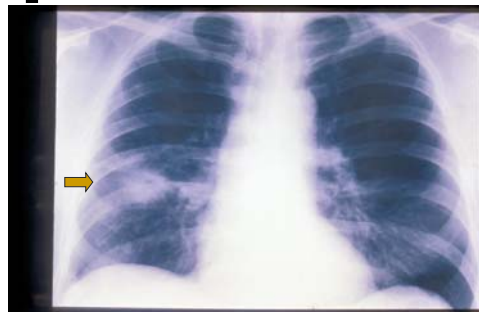
## Lung Neoplasms

- Primary
  - benign (rare)
  - malignant (very common)
- Metastatic (Very common)

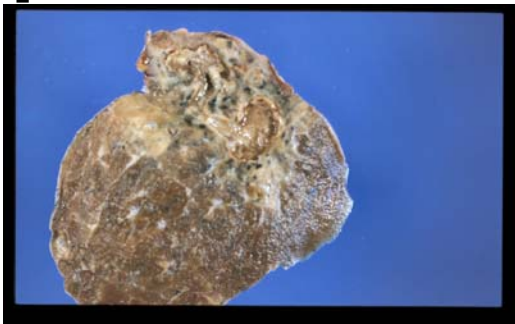
Male 21 – metastatic osteosarcoma



Suspicious lesion on CXR.....



Lung abscess (surgical resection)



Primary Lung Cancer

## [ The Size of the Problem 1 ]

- 30,000 new cases of lung cancer per year in England (6,000 in Scotland)
- Commonest cause of cancer death (33%) in men
- Commonest cause of cancer death in women in Scotland (20%)
- 90% mortality 1 year after diagnosis
- The most rapidly increasing cancer in developing countries

## [ Tobacco smoke.... ]

- polycyclic hydrocarbons
  - aromatic amines
  - phenols
  - nickel
  - cyanates
- 20% of smokers die of lung cancer  
(also suffer laryngeal, cervical, bladder, mouth, oesophageal, colon cancer)

## [ Other risk factors..... ]

- Asbestos
- nickel
- chromates
- radiation
- atmospheric pollution
- (genetics)

## [ Clinical Presentation 1 ]

- Local effects
  - obstruction of airway (pneumonia)
  - invasion of chest wall (pain)
  - ulceration (haemoptysis)

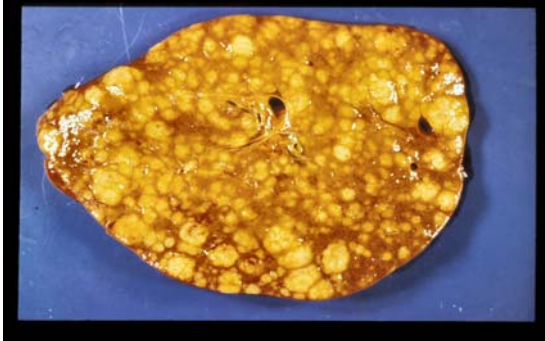
White tumour obstructing bronchus. Distal area of yellow discolouration represents pneumonia.



## [ Clinical Presentation 2 ]

- Metastases
  - nodes
  - bones
  - liver
  - brain

Metastatic small cell lung cancer in liver at autopsy.



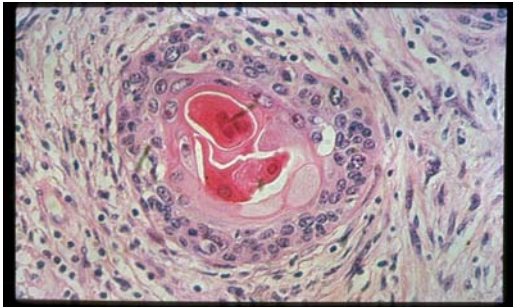
### Clinical Presentation 3

- Systemic effects
  - weight loss
  - "ectopic" hormone production
    - PTH (SQUAMOUS CANCER)
    - ACTH (SMALL CELL CANCER)

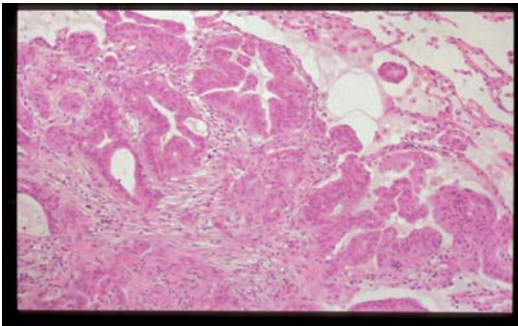
### Classification of Lung Tumours

- Very heterogeneous
- 4 common smoking-associated types
  - adenocarcinoma (35%)
  - squamous carcinoma (30%)
  - small cell carcinoma (25%)
  - large cell carcinoma (10%)
- Neuroendocrine tumours
- Bronchial gland tumours

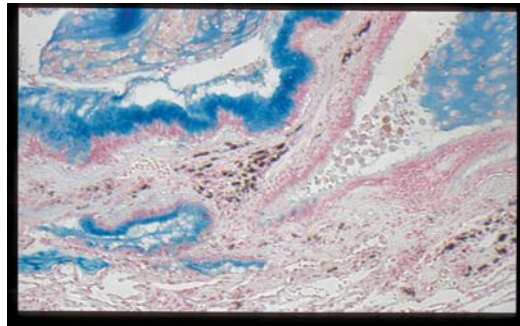
Squamous carcinoma (keratinising)



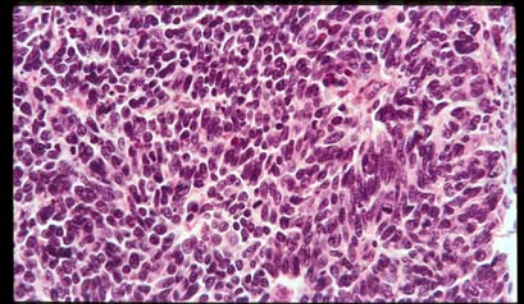
Adenocarcinoma (gland forming)



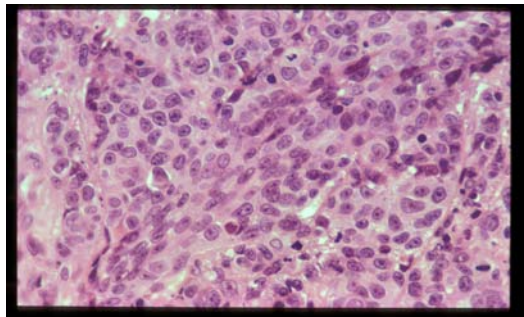
Adenocarcinoma with mucin (blue stained)



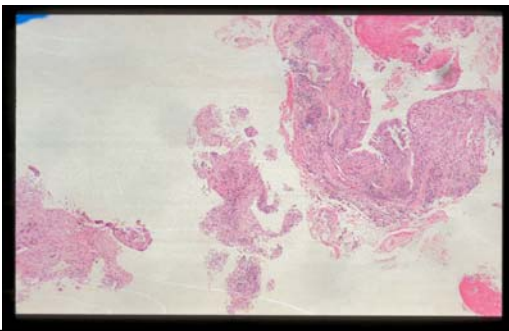
[ Small cell carcinoma ]



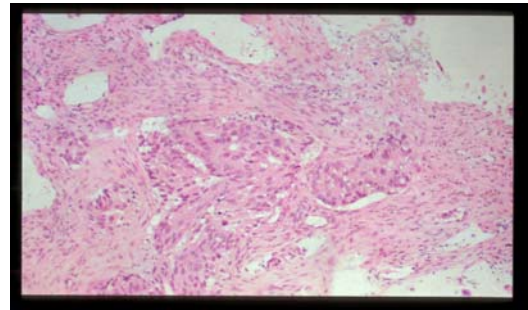
[ Large cell carcinoma ]



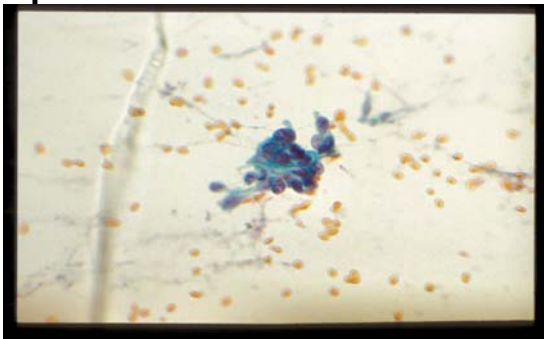
[ A bronchial biopsy ]



[ Cancer...which type? ]



[ Malignant cells in cytological specimen ]



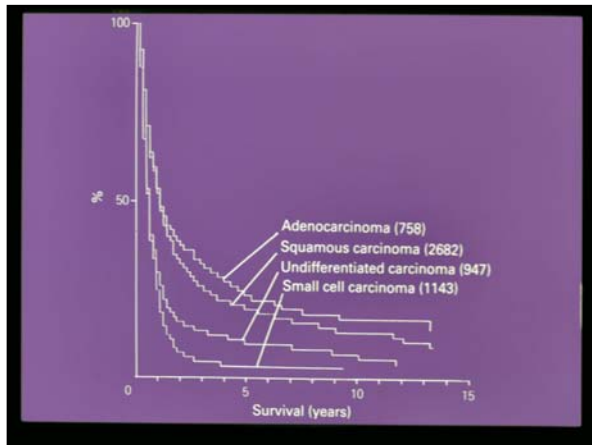
[ WHY CLASSIFY? ]

## Classification

- Prognosis
- Treatment
- Pathogenesis/biology
- Epidemiology

## Prognosis and Histology

- Survival time:
- Small cell worst (almost all dead in one year)
- Large cell worse than squamous or adenocarcinoma



## Treatment and Histology

- Small cell known to be chemosensitive but with rapidly emerging resistance
- Surgery the treatment of choice in other types. “Non-small cell” regimens have also been developed in chemotherapy/radiotherapy

## The most simple classification of lung cancer:

Small cell lung cancer (SCLC)  
 V.  
 Non-small cell lung cancer (NSCLC)

## Molecular Genetic Abnormalities (potential therapeutic targets)

	SCLC	NSCLC
Oncogenes	myc	myc, K-ras, her2(neu)
Tumour suppressor genes	p53, Rb, 3p	p53, 1q, 3p,9p,11p, Rb

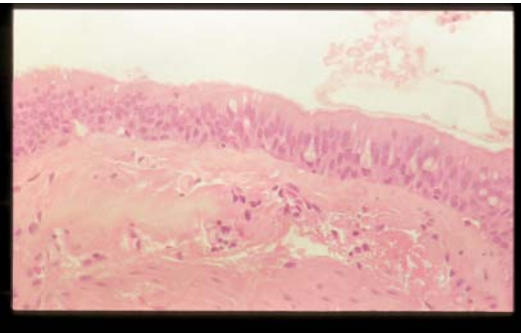
## Pathogenesis

- Pulmonary epithelium
  - Bronchial (ciliated, mucous, neuroendocrine, reserve)
  - Bronchioles/alveoli (Clara cells, types 1 and 2 alveolar lining cells)

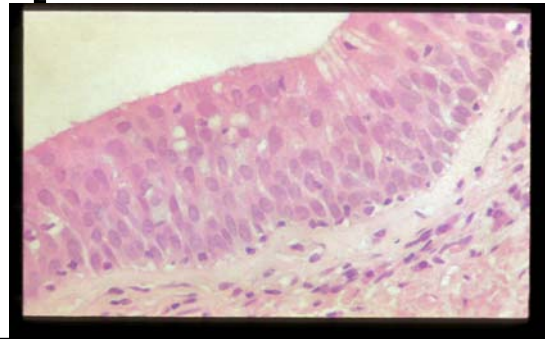
## Bronchial (large airway) Tumours

- Squamous metaplasia
- Dysplasia
- Carcinoma in situ
- Invasive malignancy

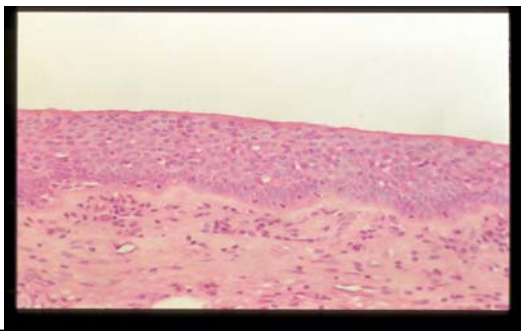
## Normal bronchial mucosa



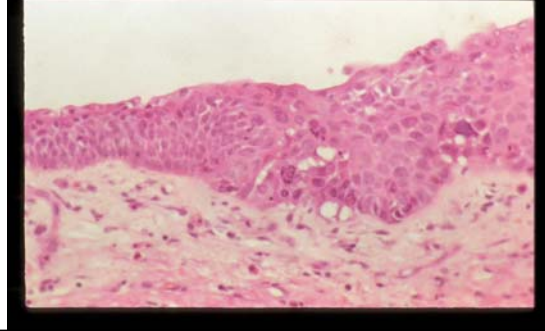
## Basal cell hyperplasia



## Squamous metaplasia



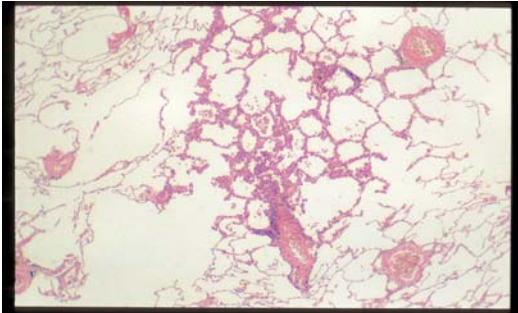
## Dysplasia/carcinoma in situ



## Peripheral Adenocarcinomas

- Atypical adenomatous hyperplasia
- Spread of neoplastic cells along alveolar walls (bronchioloalveolar carcinoma)
- True invasive adenocarcinoma
- THIS PATTERN IS BECOMING COMMONER

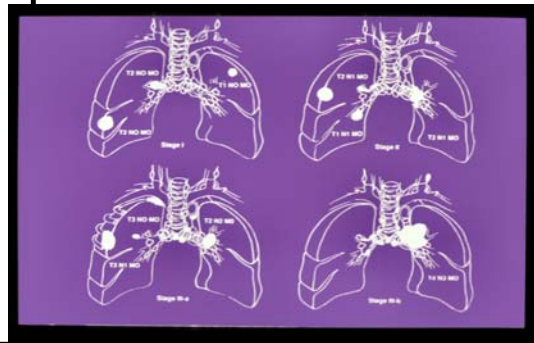
## Atypical adenomatous hyperplasia



## Prognostic Indicators in Lung Cancer

- Tumour stage
- Tumour histological subtype

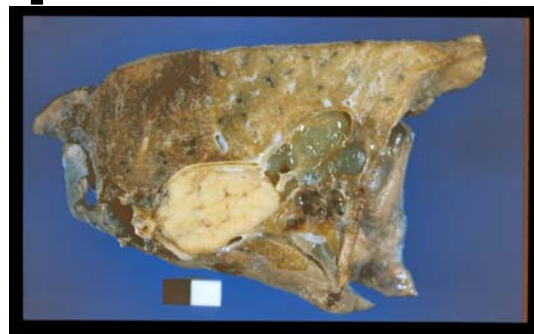
## TNM staging



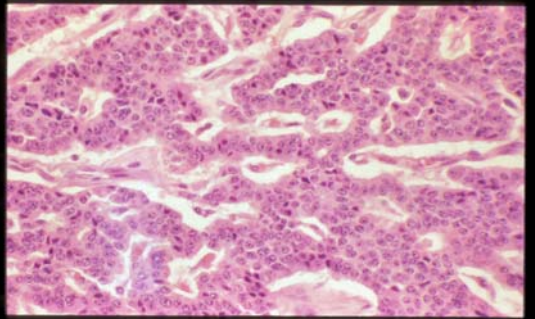
## Other Lung Neoplasms

- Carcinoid: Neuroendocrine neoplasms of low grade malignancy
- Bronchial gland neoplasms (tumours more often seen in salivary glands)
  - Adenoid cystic carcinoma
  - Mucoepidermoid carcinoma

## Large obstructing carcinoid tumour



### [ Carcinoid histology ]



### [ Pleural Neoplasia ]

- Benign tumours rare
- Primary malignant neoplasm – mesothelioma (see lecture on pleural disease)
- Also a very common site of invasion by lung carcinomas and metastatic cancers