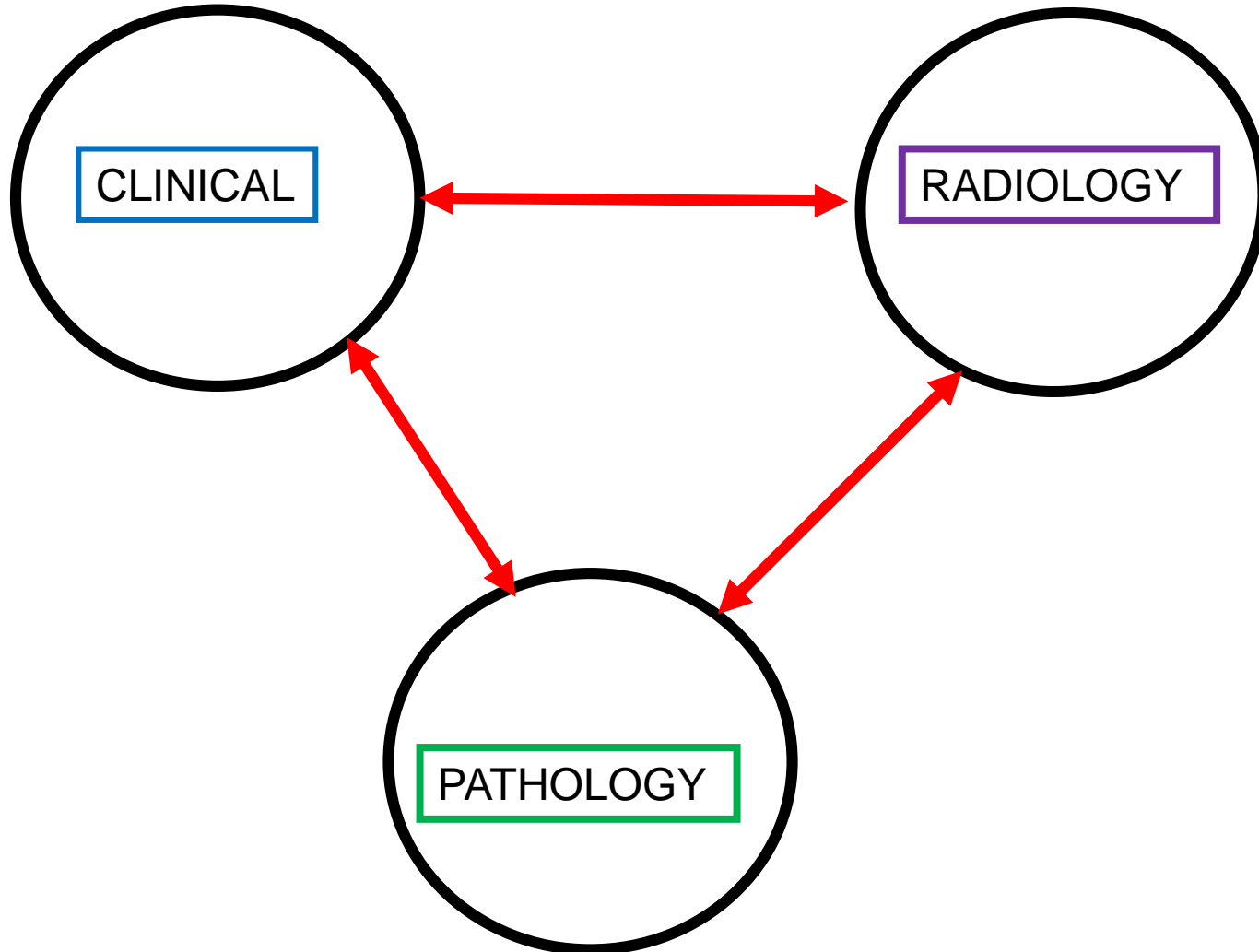


INTERSTITIAL LUNG DISEASE INTERDISCIPLINARY NETWORK  
CONFERENCE 8-9<sup>TH</sup> OCTOBER 2023, EDGBASTON PARK HOTEL,  
BIRMINGHAM

# **Use and Interpretation of the Histopathology Process in the Diagnosis of ILD**

Professor Richard Attanoos  
University Hospital of Wales,  
Cardiff University

# MDD – GOLD STANDARD FOR ILD



# CONSIDER

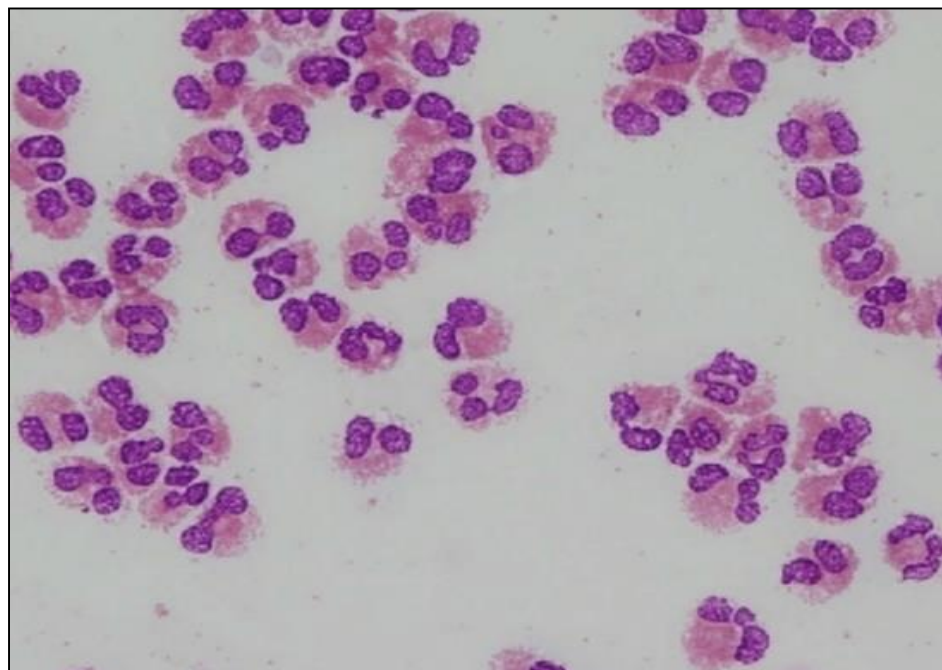
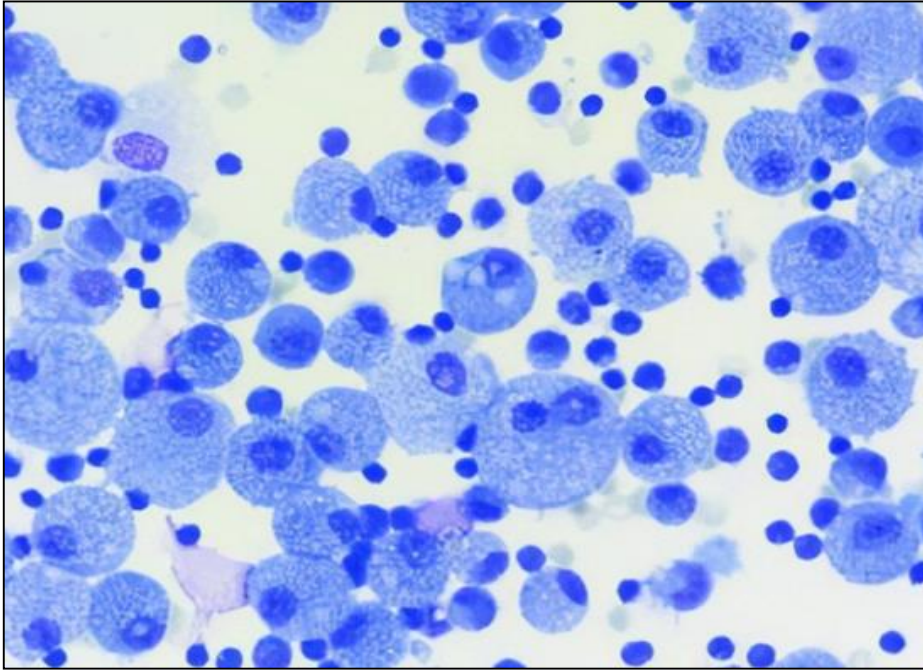
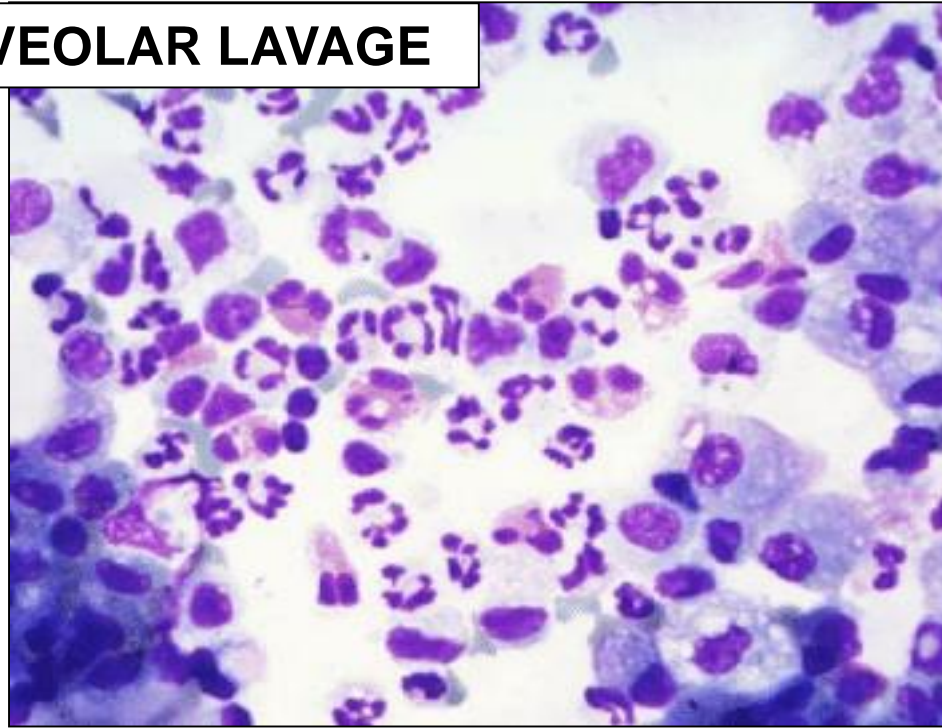
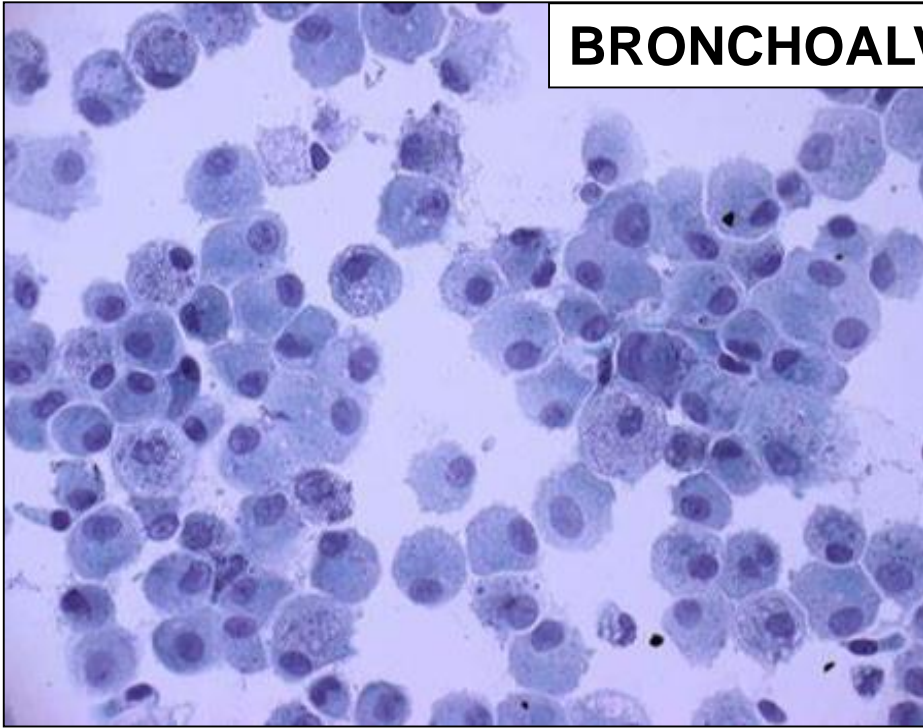
- Clinical /laboratory findings
- Radiology
- Pathology
  - LAVAGE-BAL
  - FNA EBUS
  - TRANSBRONCHIAL
  - CRYOBIOPSY
  - **Surgical Lung Biopsy**



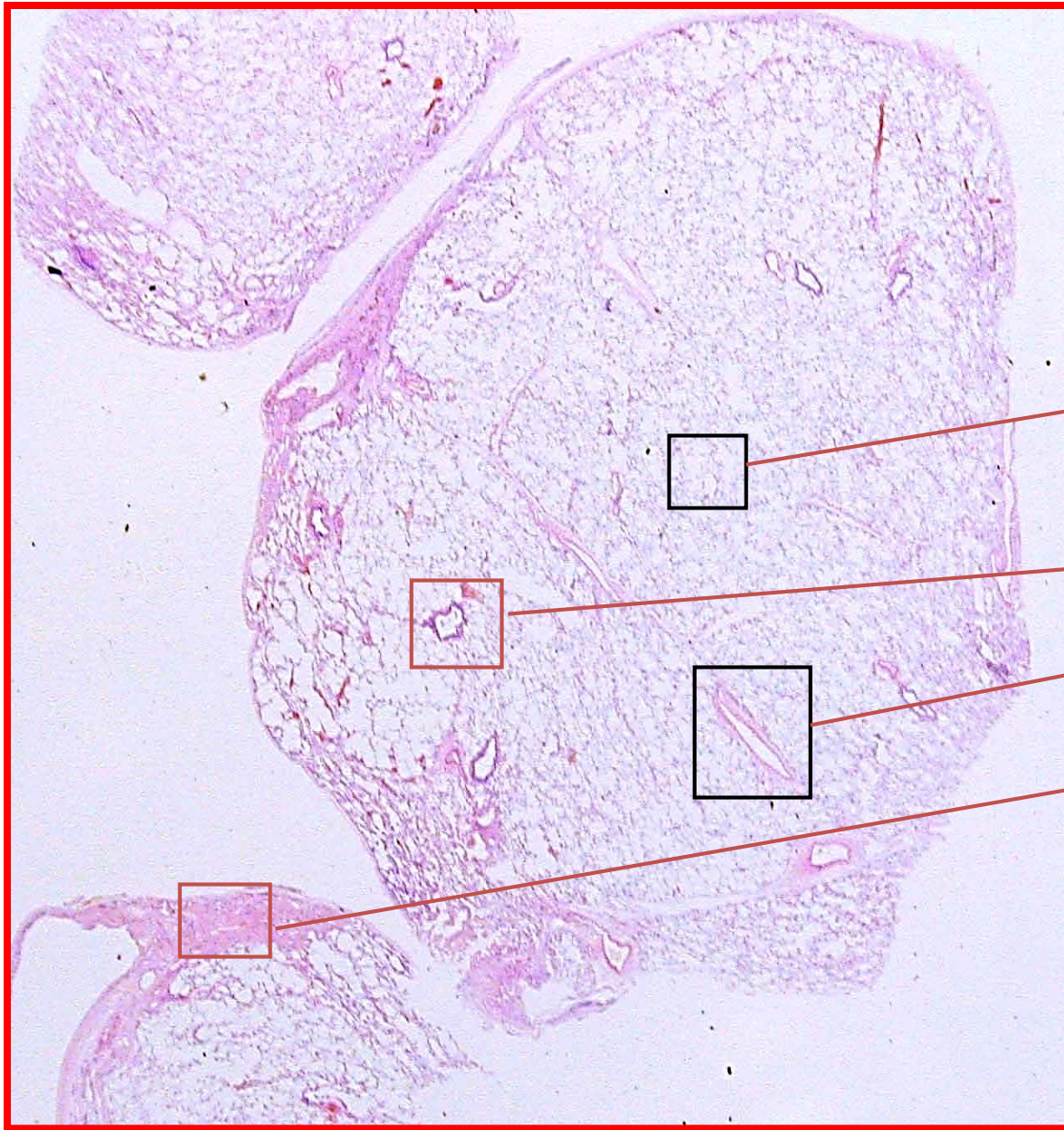
1. IS THIS A SPECIFIC DISEASE?

2. IF NO, DOES PATHOLOGY  
INDICATE INJURY MECHANISM?

# BRONCHOALVEOLAR LAVAGE







Assess:

- **Interstitium**
- **Alveoli**
- **Airways**
- **Vasculature**
- **Pleura**
- **Polarize**

# BASIC PATTERNS TO LUNG INJURY

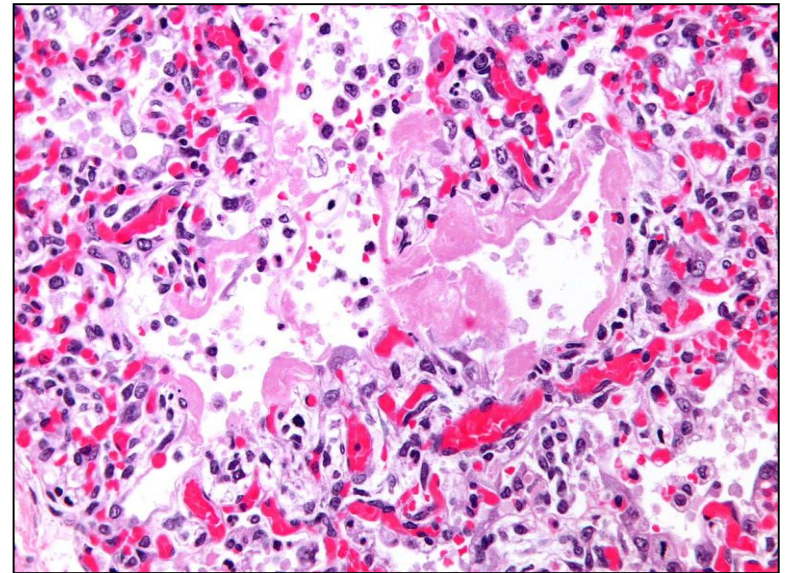
# Pattern based approach

- Acute lung injury
- Fibrosis
- Alveolar filling/Air-space pathology
- Chronic Cellular infiltrates
- Nodules
- Near Normal Lung

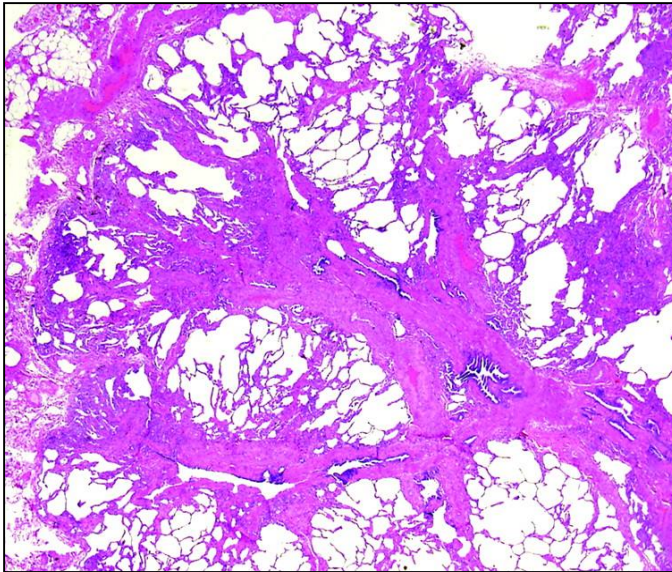


# PATTERNS OF LUNG INJURY

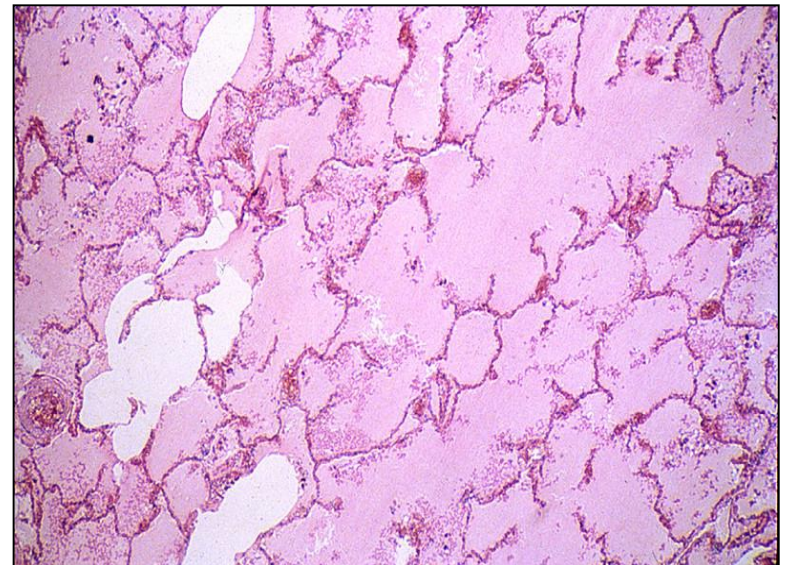
Acute lung injury



Fibrosis



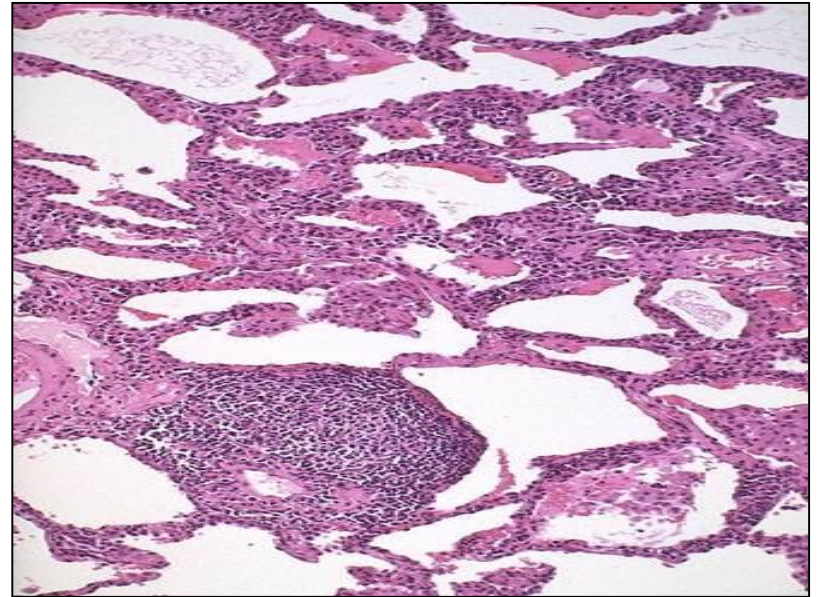
Alveolar filling pathology



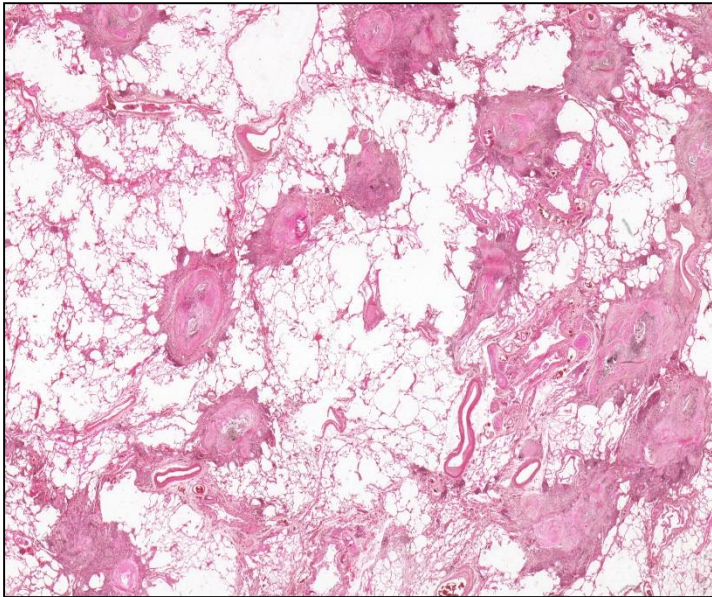


# PATTERNS OF LUNG INJURY

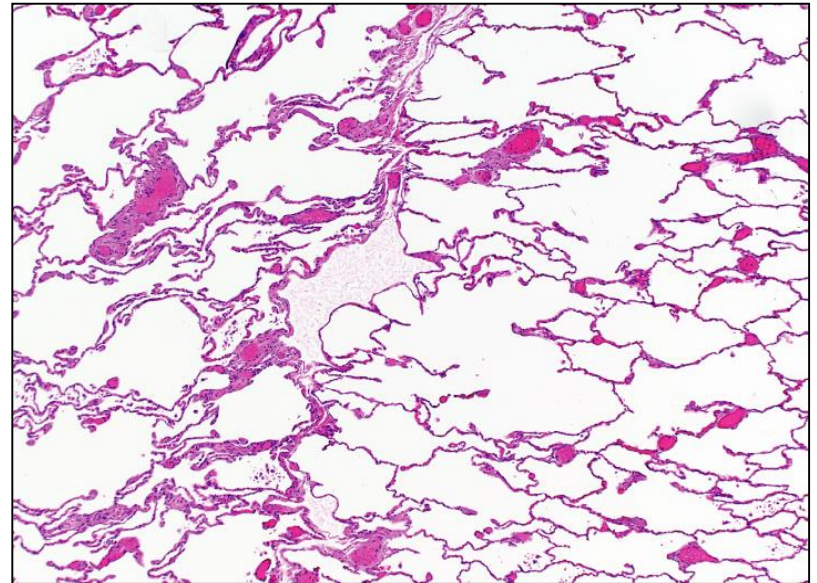
Chronic Cellular infiltrates



Nodules



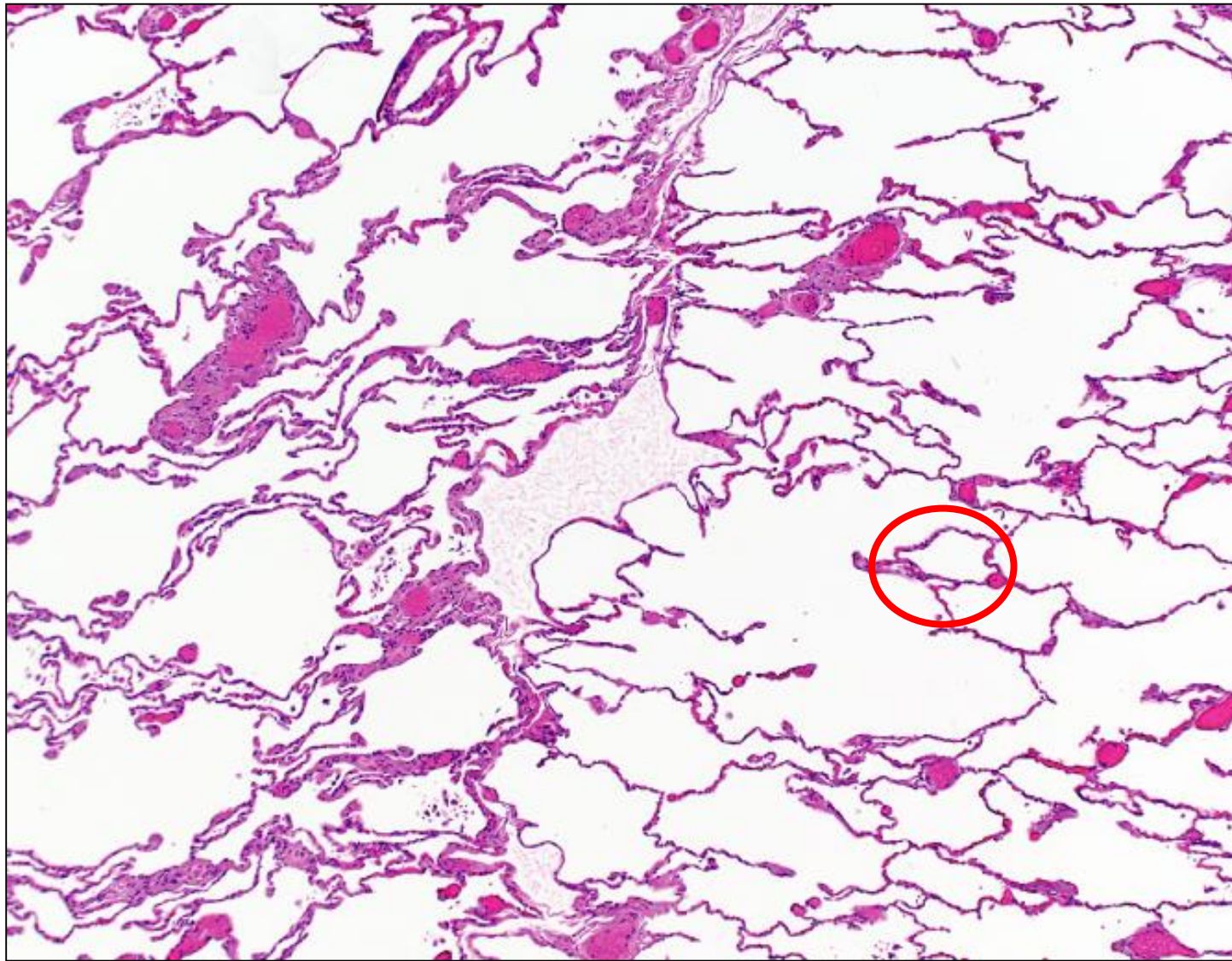
Near Normal Lung/  
Minimal changes



# Pattern based approach

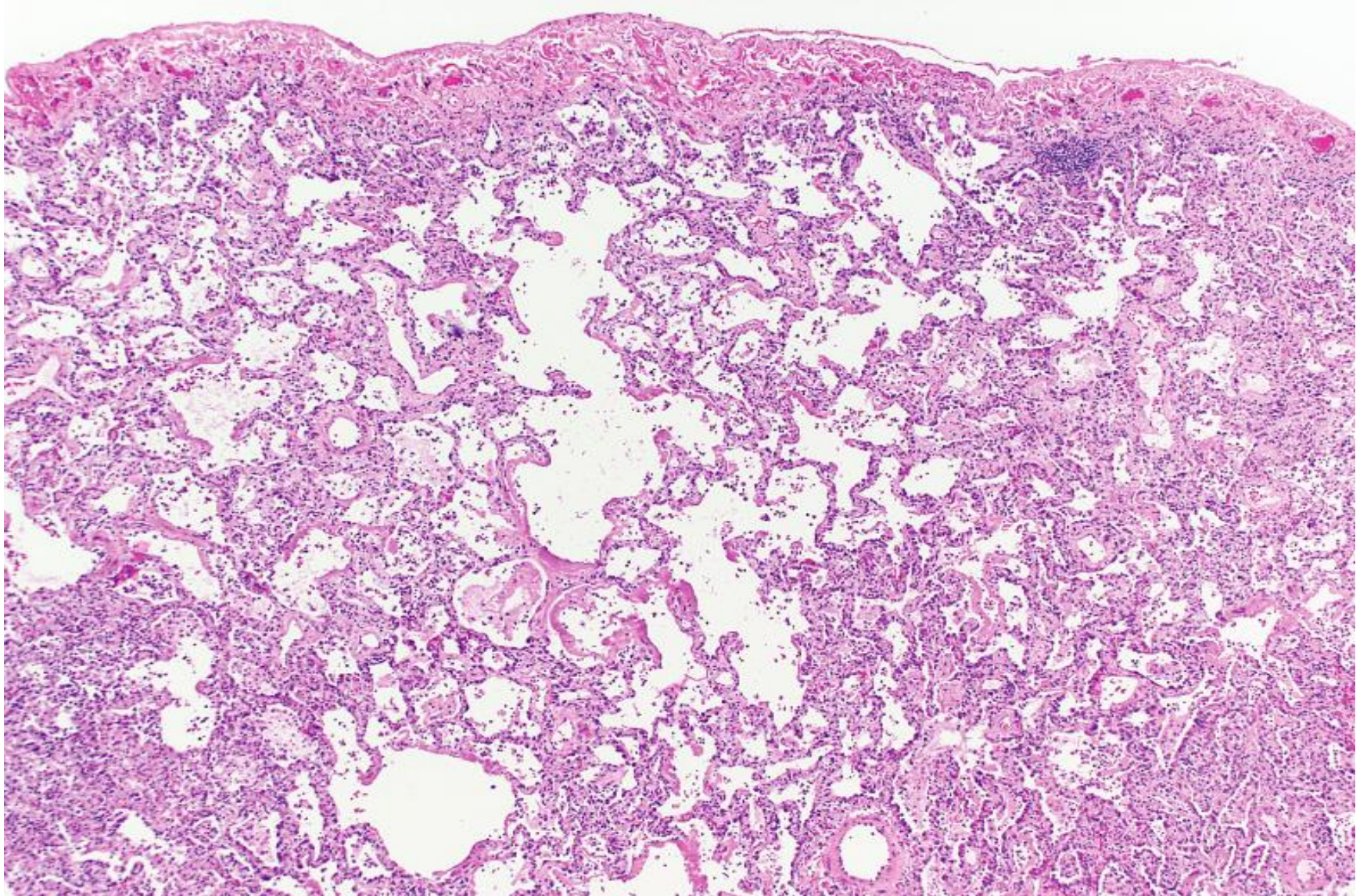
- Acute lung injury – Diffuse Alveolar Damage
- Fibrosis
- Alveolar filling/Air-space pathology
- Chronic Cellular infiltrates
- Nodules
- Near Normal Lung





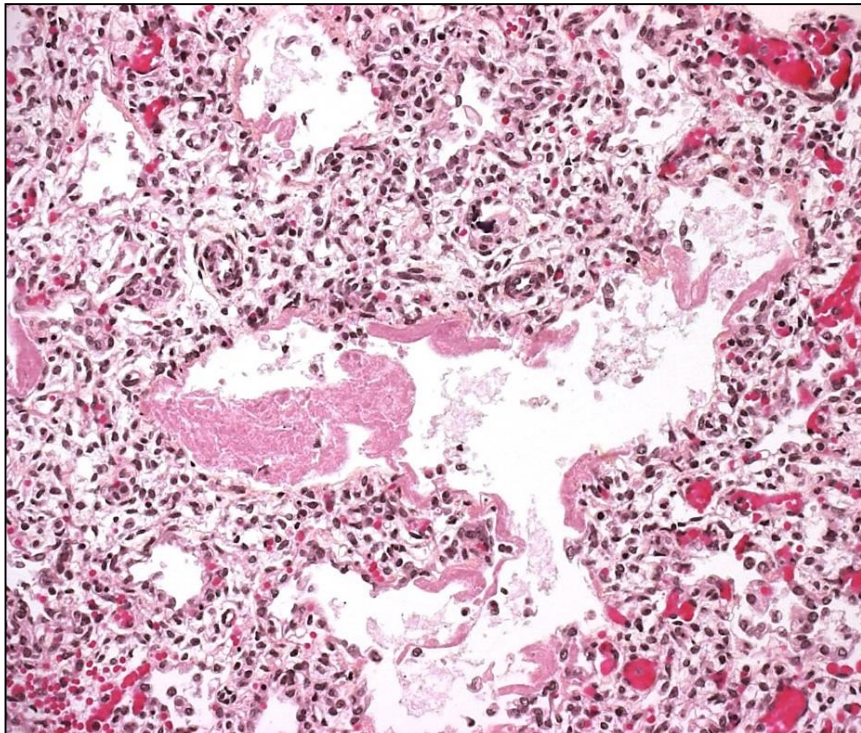
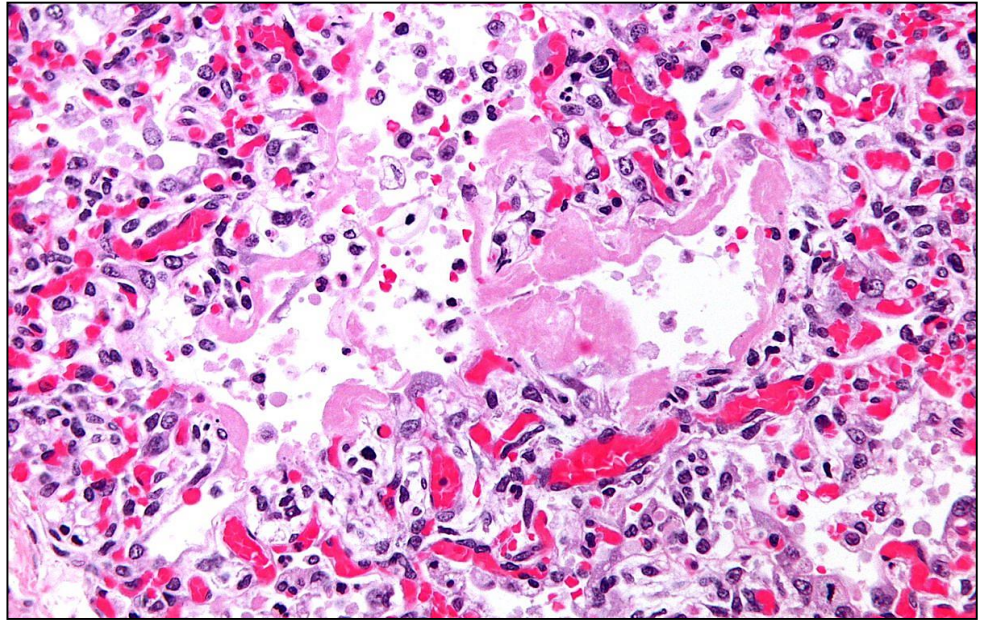
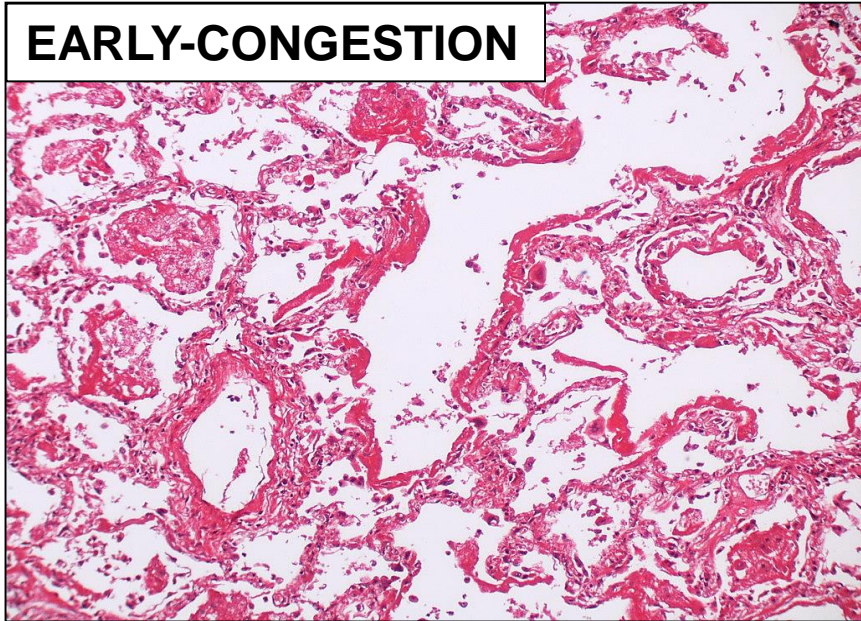


# Acute Lung Injury

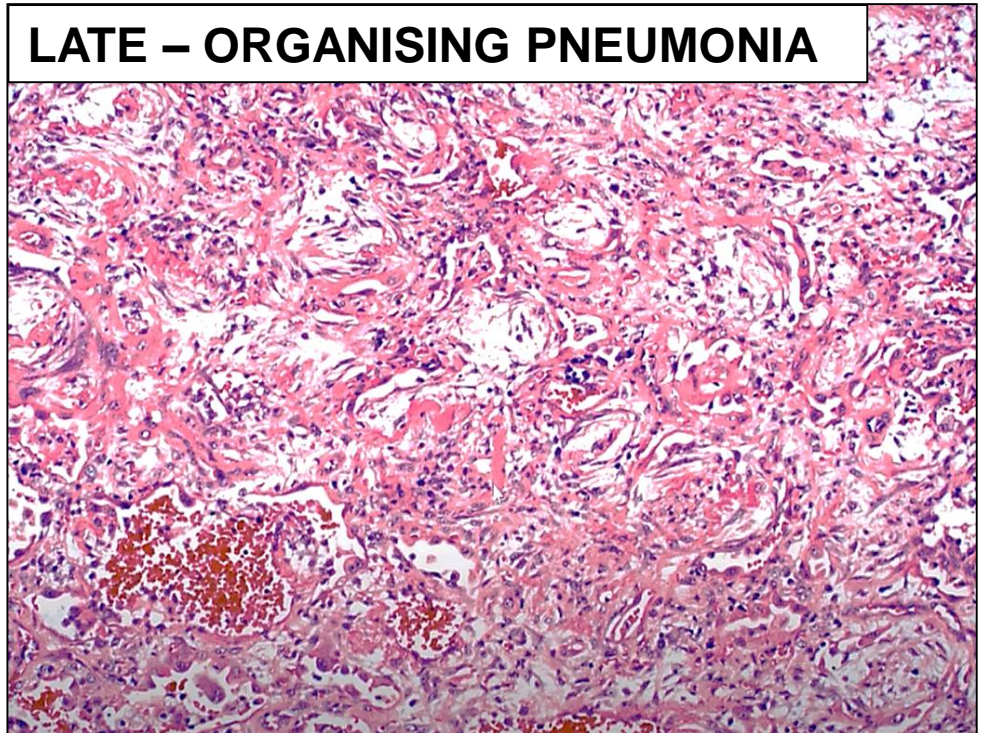




**EARLY-CONGESTION**



**LATE - ORGANISING PNEUMONIA**





# Pattern-Diffuse Alveolar Damage

Trauma/Shock

Infection/Sepsis

Toxins

Immunological Disease

Drugs

IDIOPATHIC (AIP)

# Pattern based approach

- Acute lung injury
- **Fibrosis**
- Alveolar filling pathology
- Chronic Cellular infiltrates
- Nodules
- Near Normal Lung
- Pleural pathology

# Pattern – Interstitial Fibrosis

1. Irregular, honeycombing –  
Temporal + spatial heterogeneity

UIP/IPF v HP v Collagen vascular disease

2. Uniform Alveoloseptal –  
Temporal + spatial homogeneity

NSIP v Collagen vascular disease

3. Airway-centric scarring –  
Bronchocentric

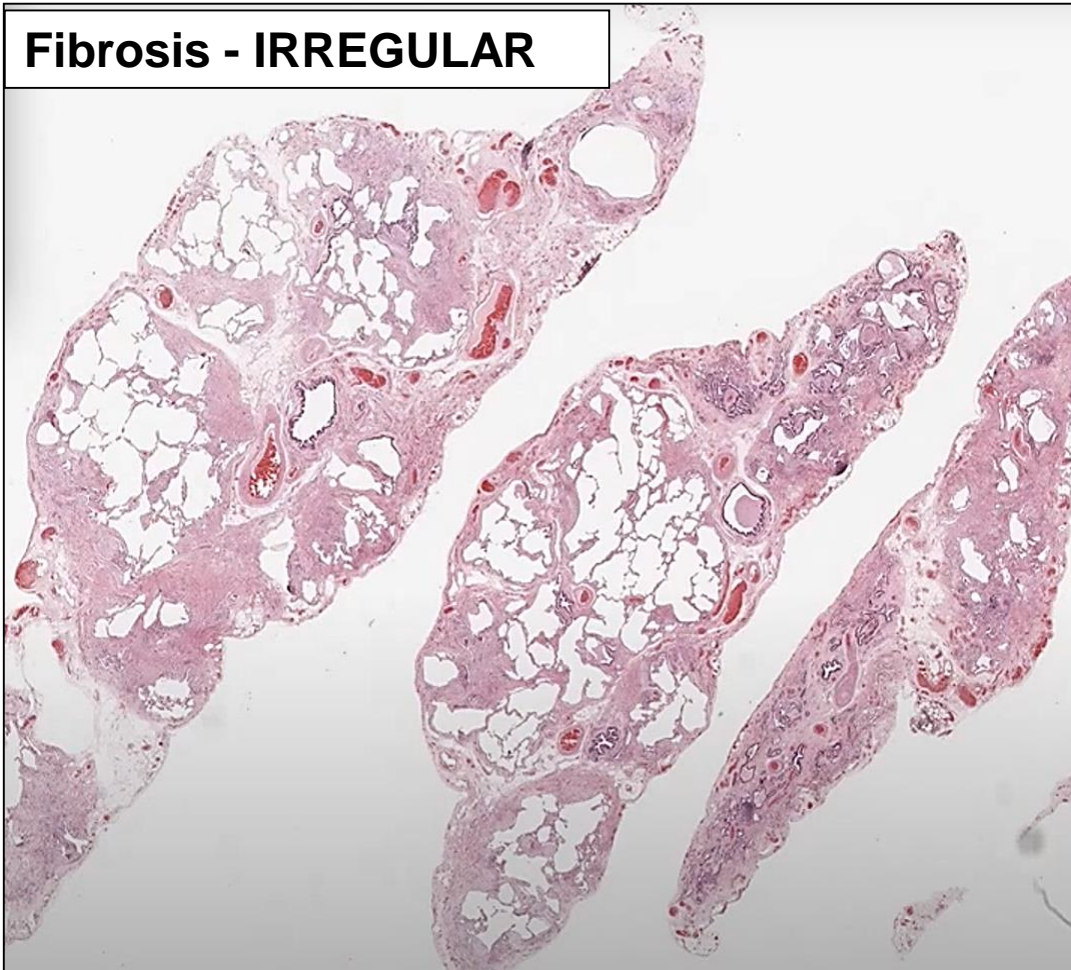
LCH v Chronic HP v inhalational injuries

4. Subpleural, mixed, emphysema

Smoking related lung fibrosis/CPFE



## Fibrosis - IRREGULAR

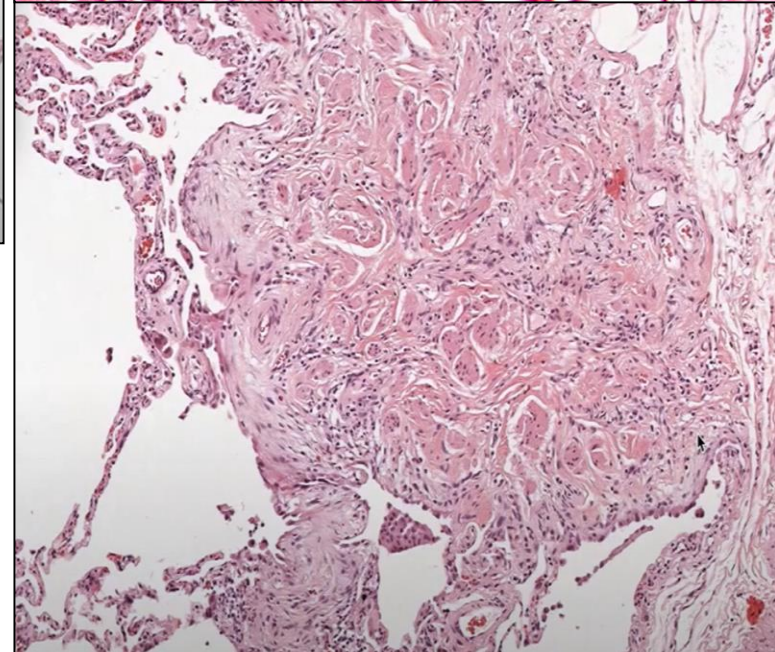
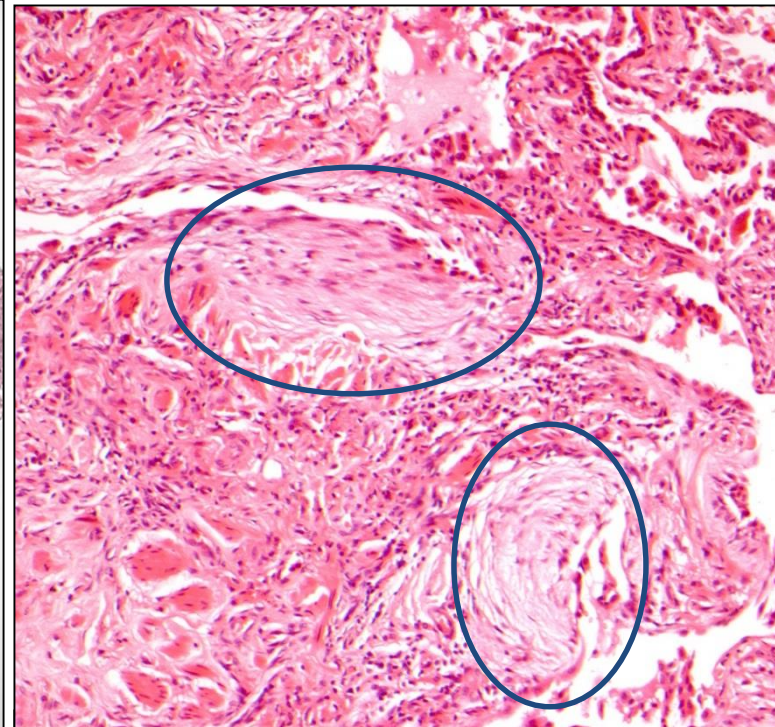


Patchy – Normal / Abnormal Old – New

Temporal & Spatial Heterogeneity –

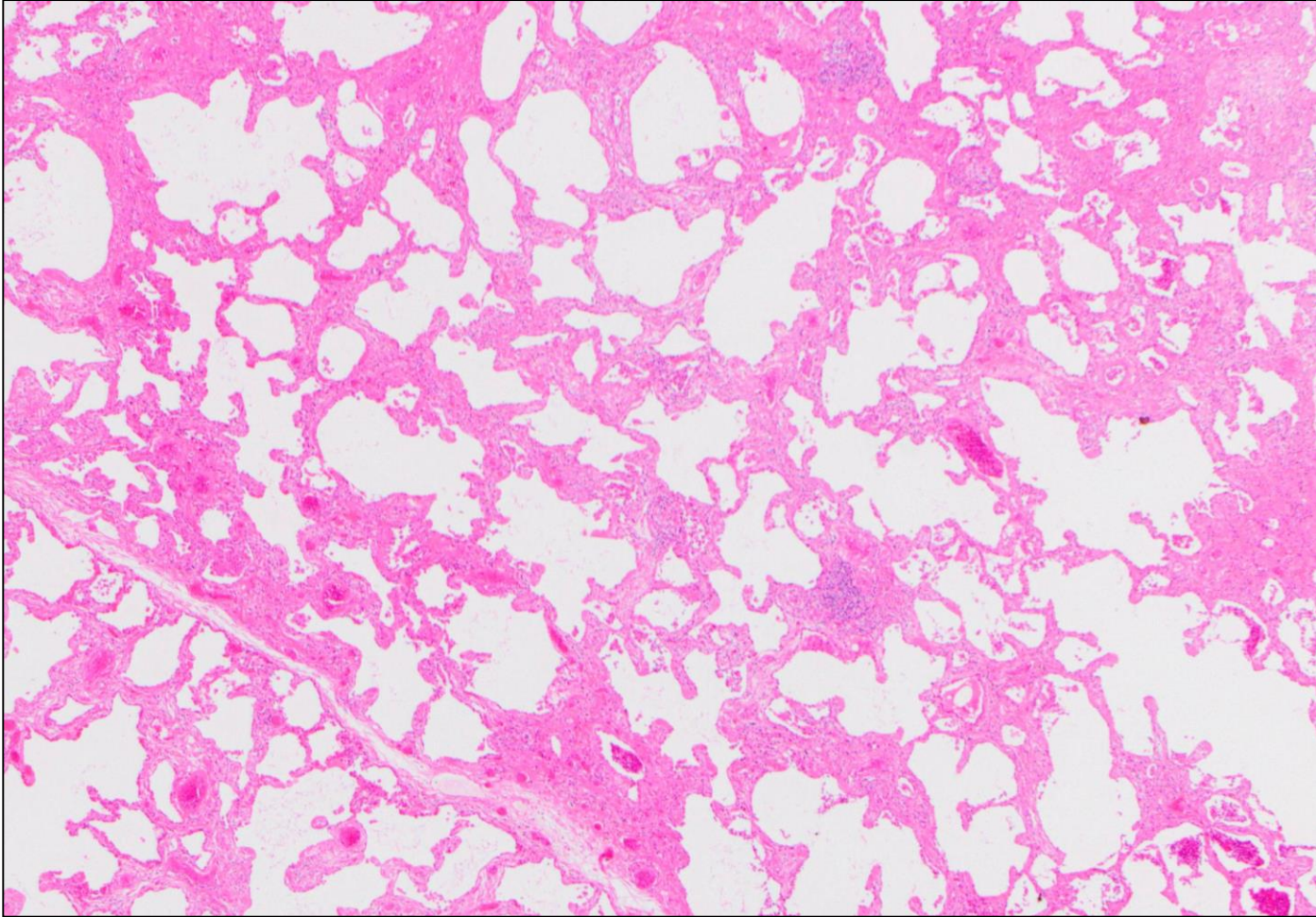
**UIP pattern**

Not a Disease Diagnosis



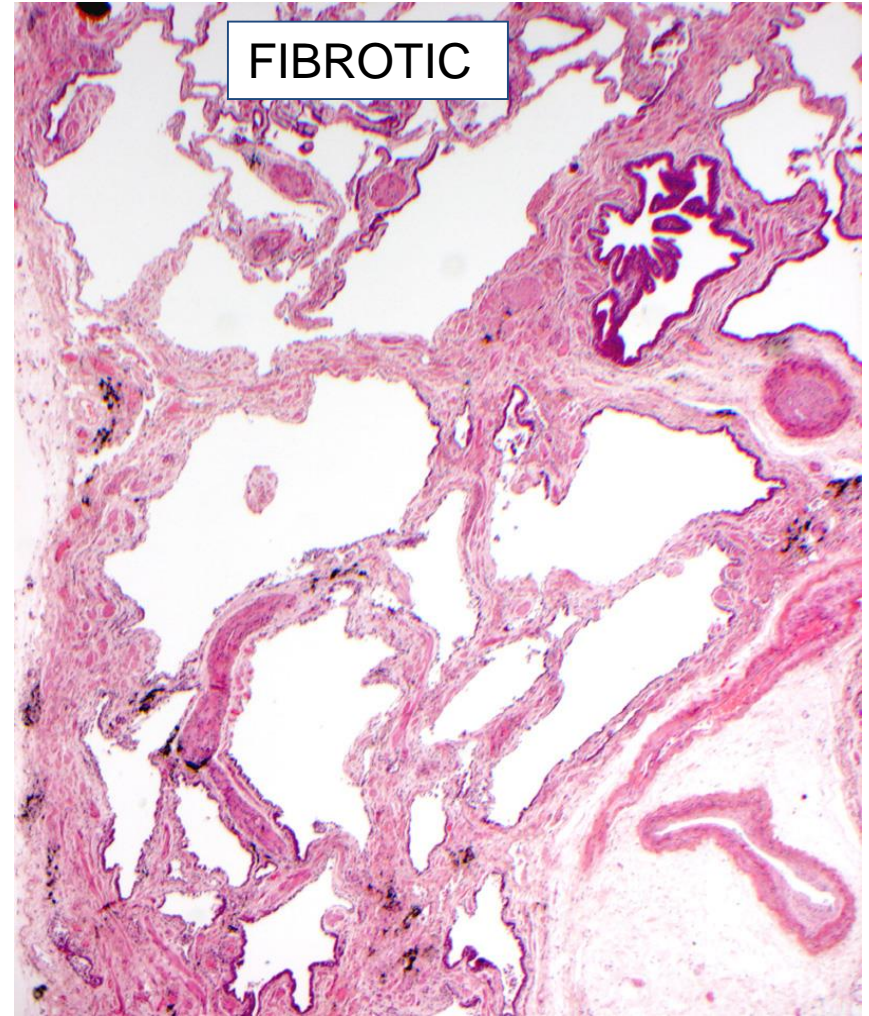


## 2. Fibrosis - UNIFORM





# Histologic features of NSIP

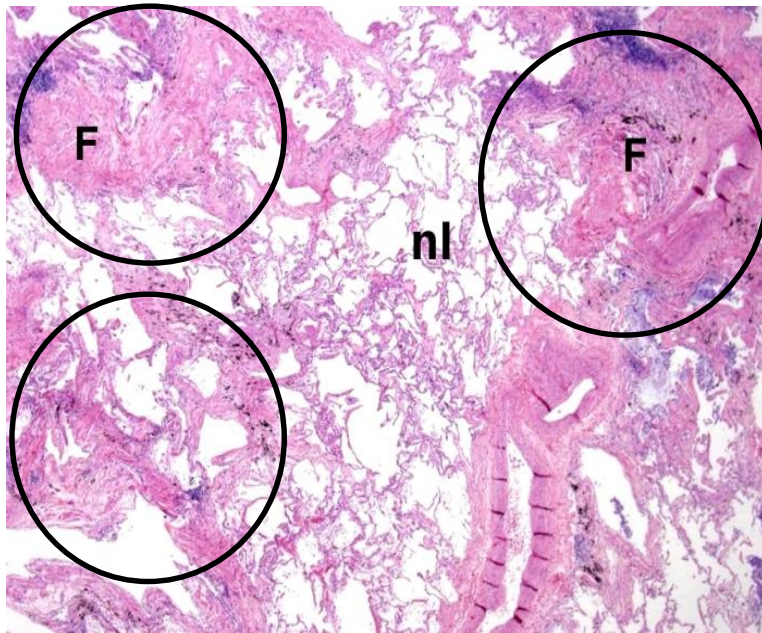


## ASBESTOSIS

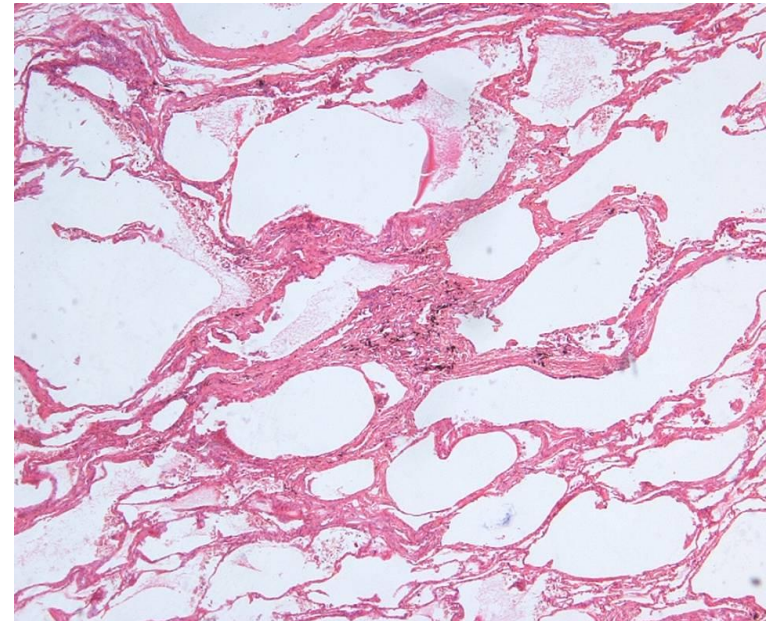
**'Fibrosis of Appropriate pattern'** (CAP-PPS 2010)

Always acellular and collagenous rather than fibroblastic and inflammatory'

IPF - UIP

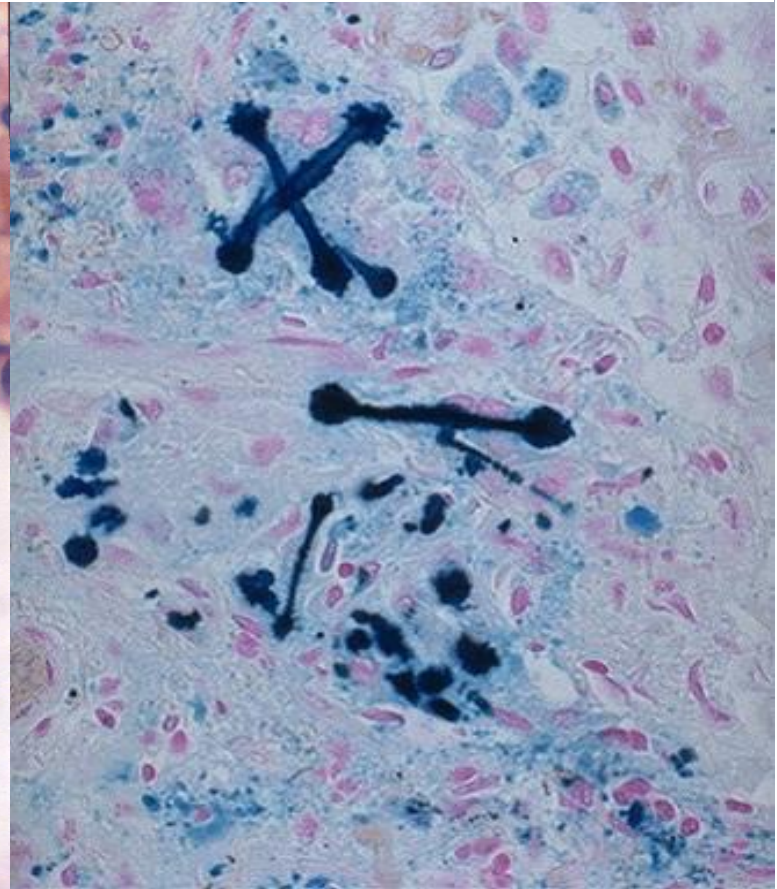
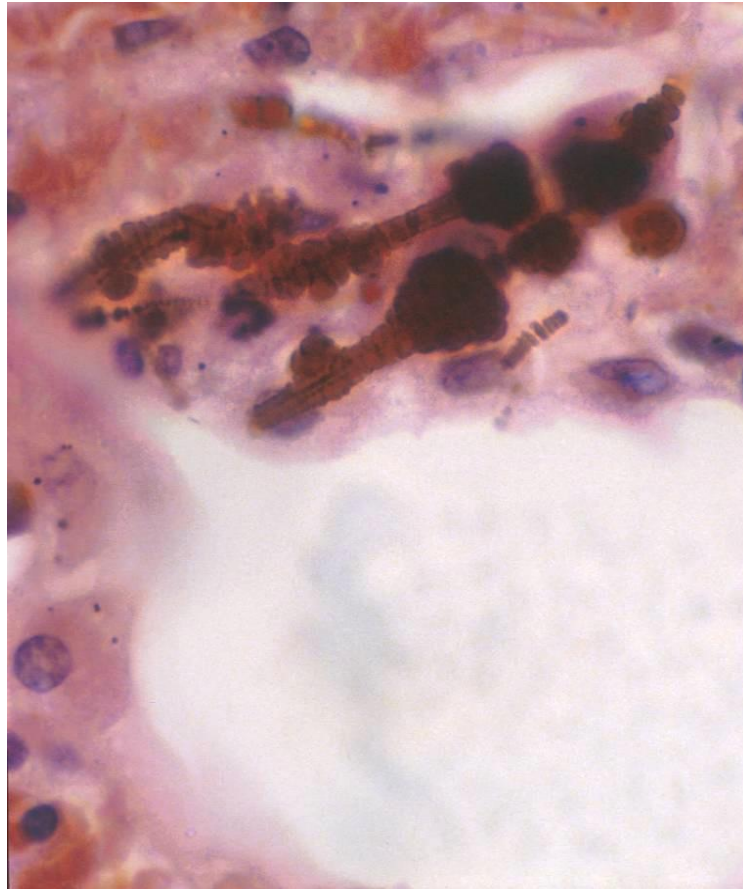


ASBESTOSIS- Fibrotic NSIP





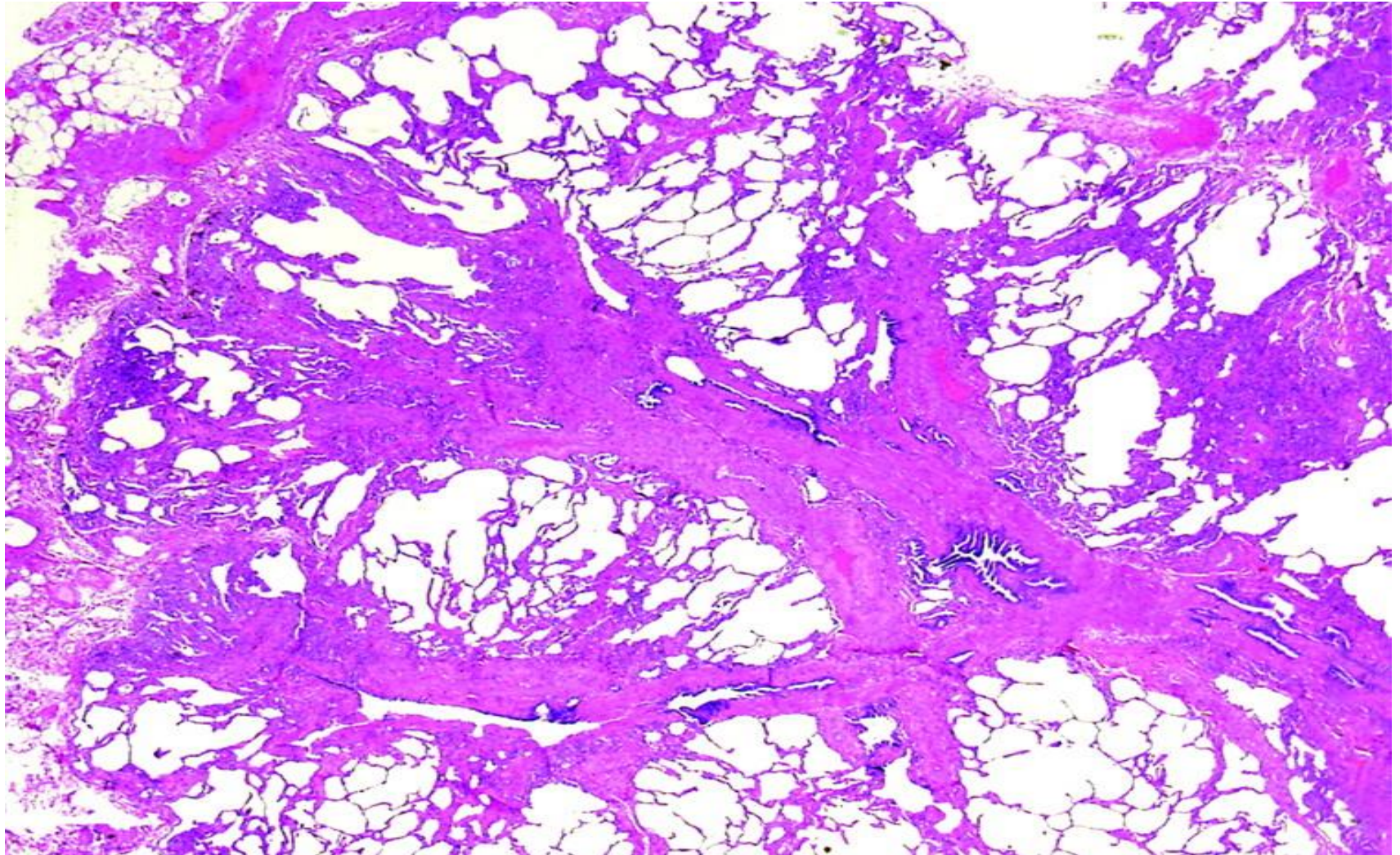
**FERRUGINOUS BODIES - AVERAGE RATE OF AT LEAST 2 PER  
1CM<sup>2</sup> LUNG  
CAP-PPS 2010**



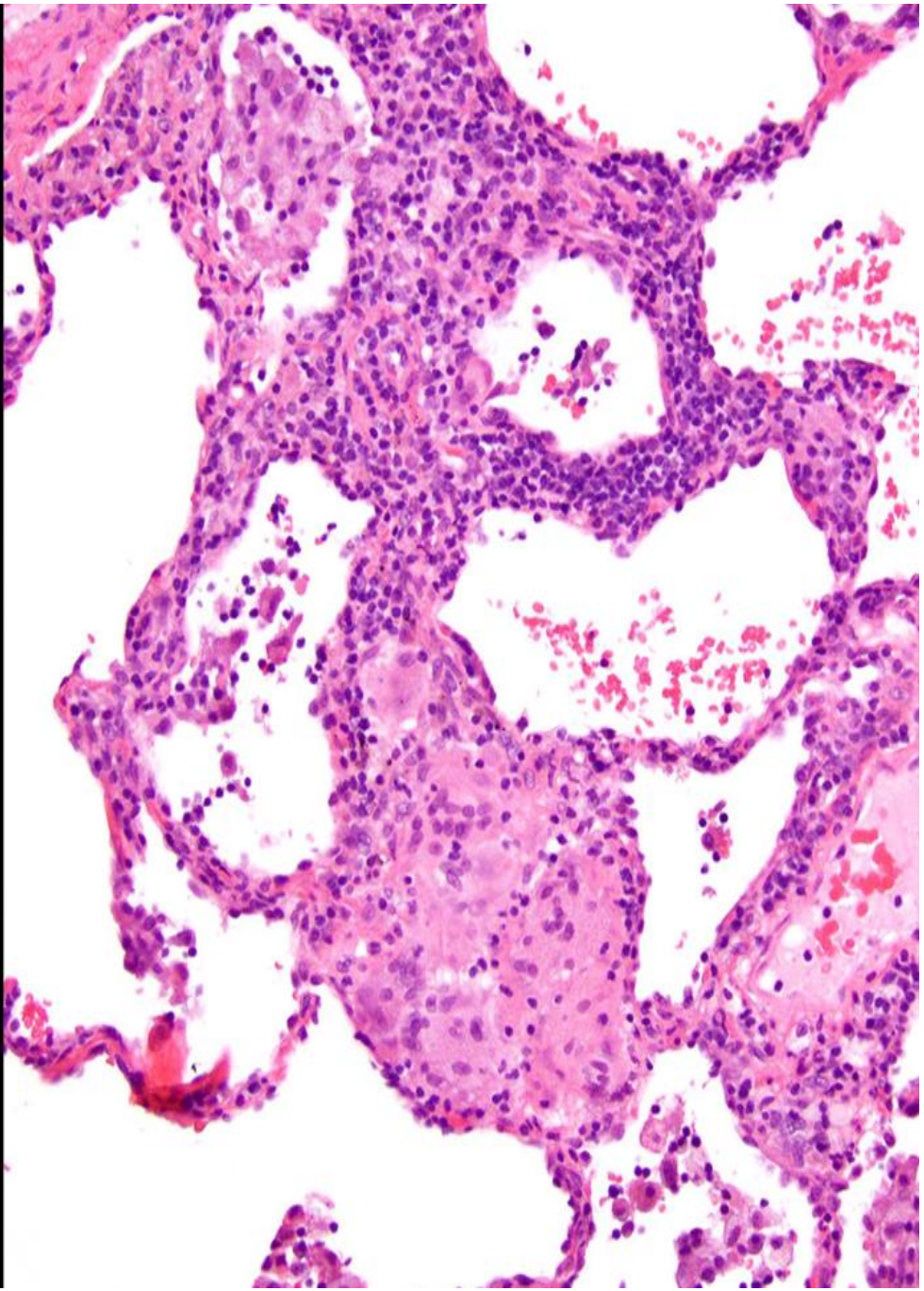
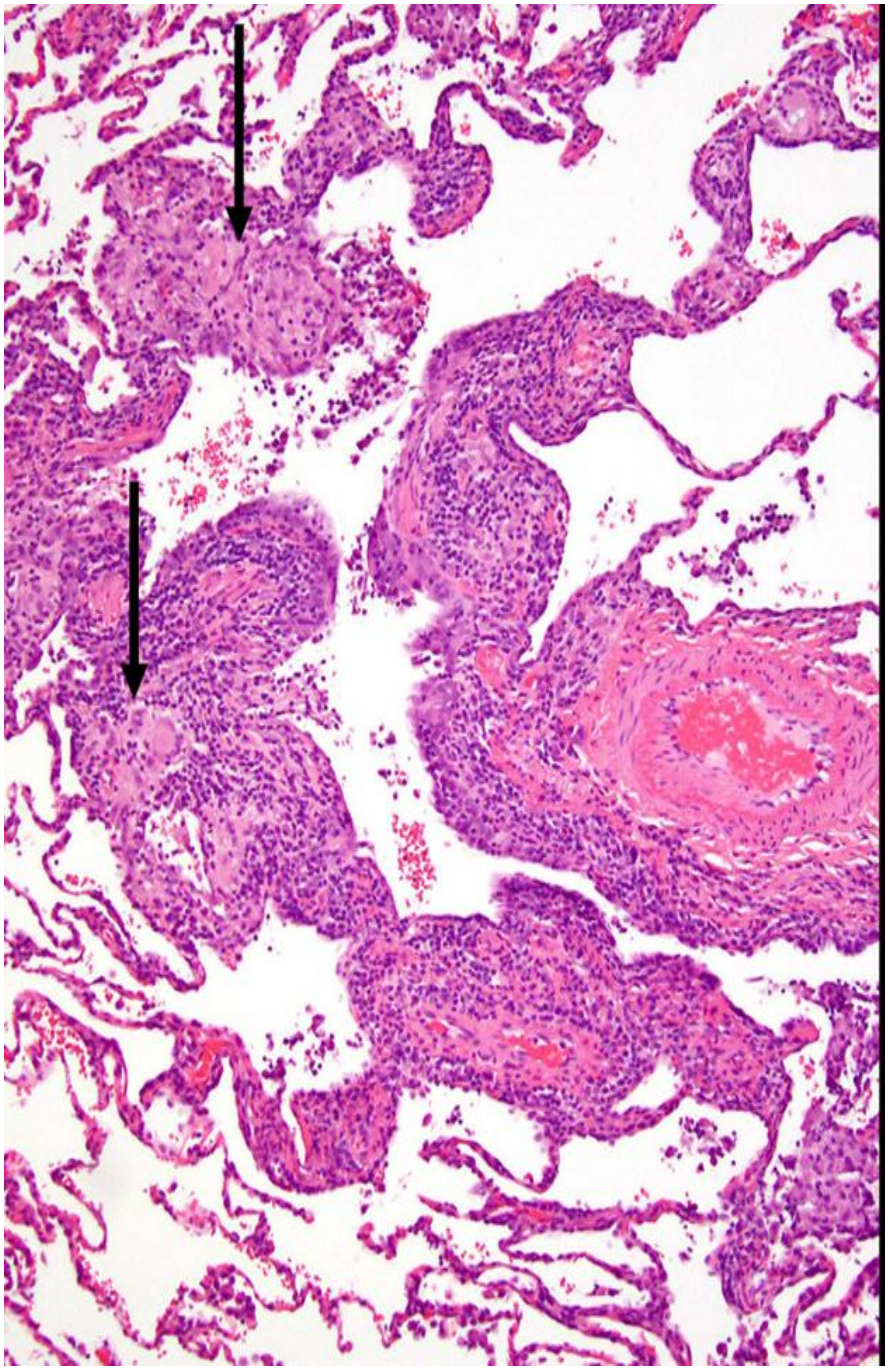


# 3. Airway centric interstitial fibrosis

Chronic hypersensitivity

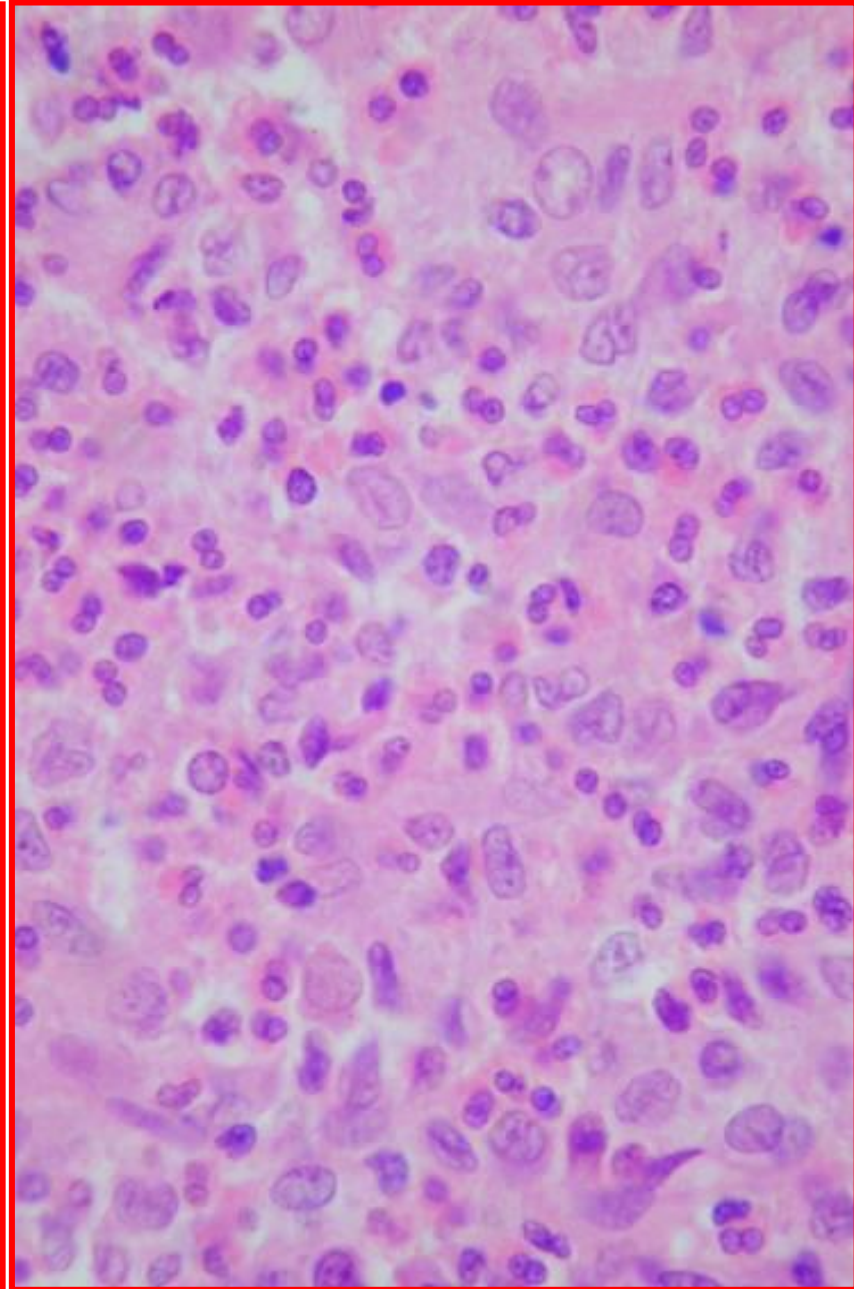
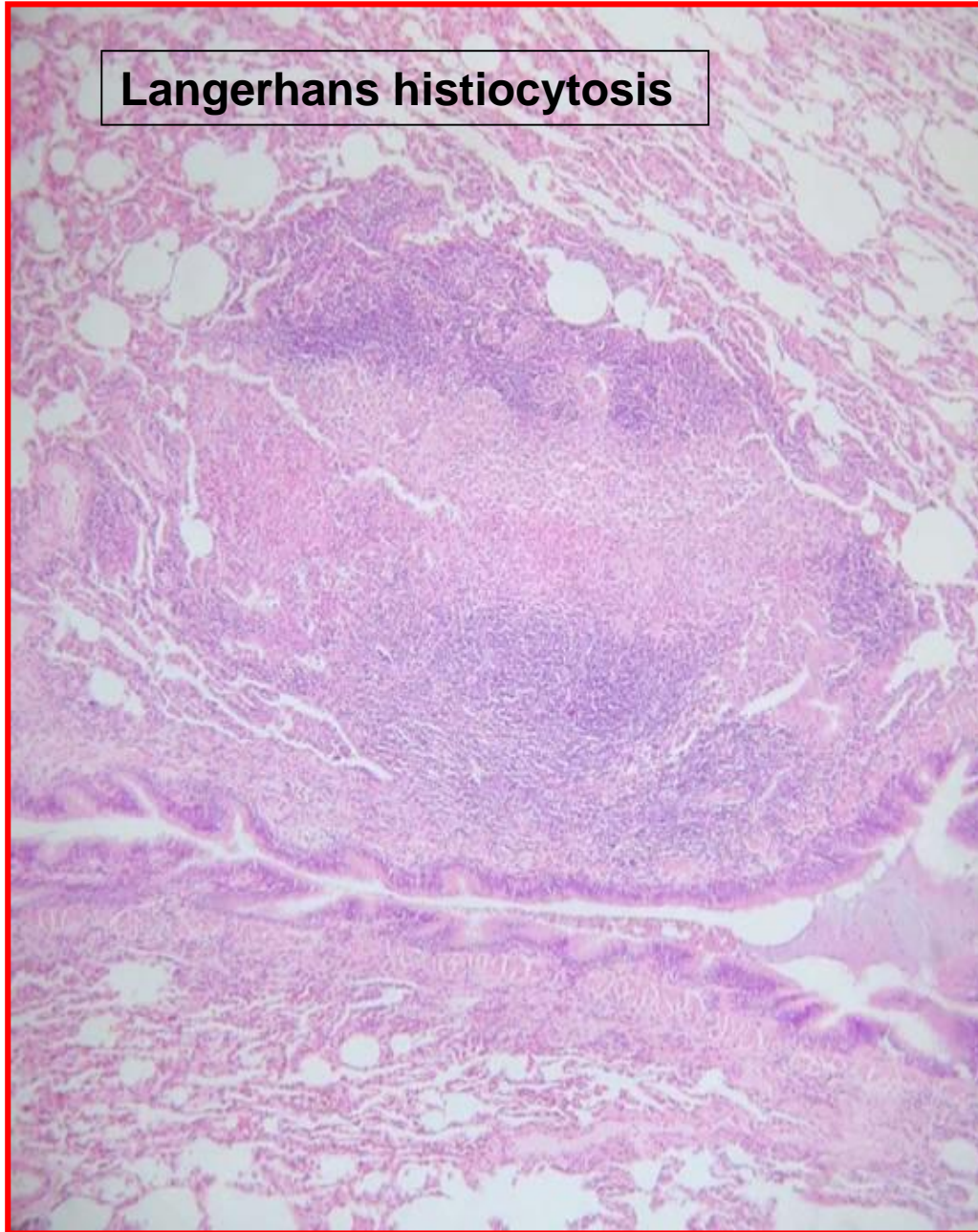








**Langerhans histiocytosis**





## Langerhans histiocytosis

EOSINOPHIL – RICH INFILTRATES

THINK

ALLERGY

DRUGS

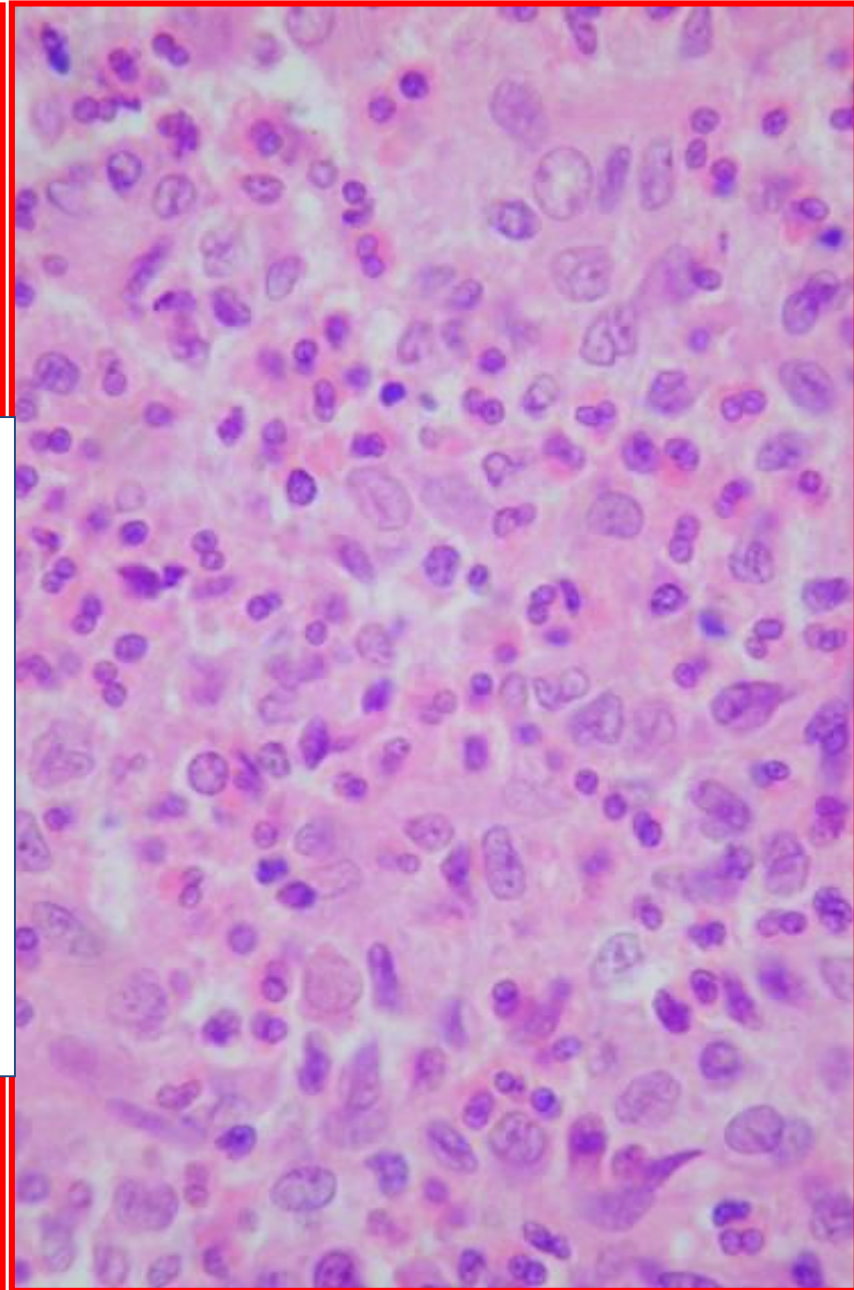
PARASITES

AUTOIMMUNE

LCH

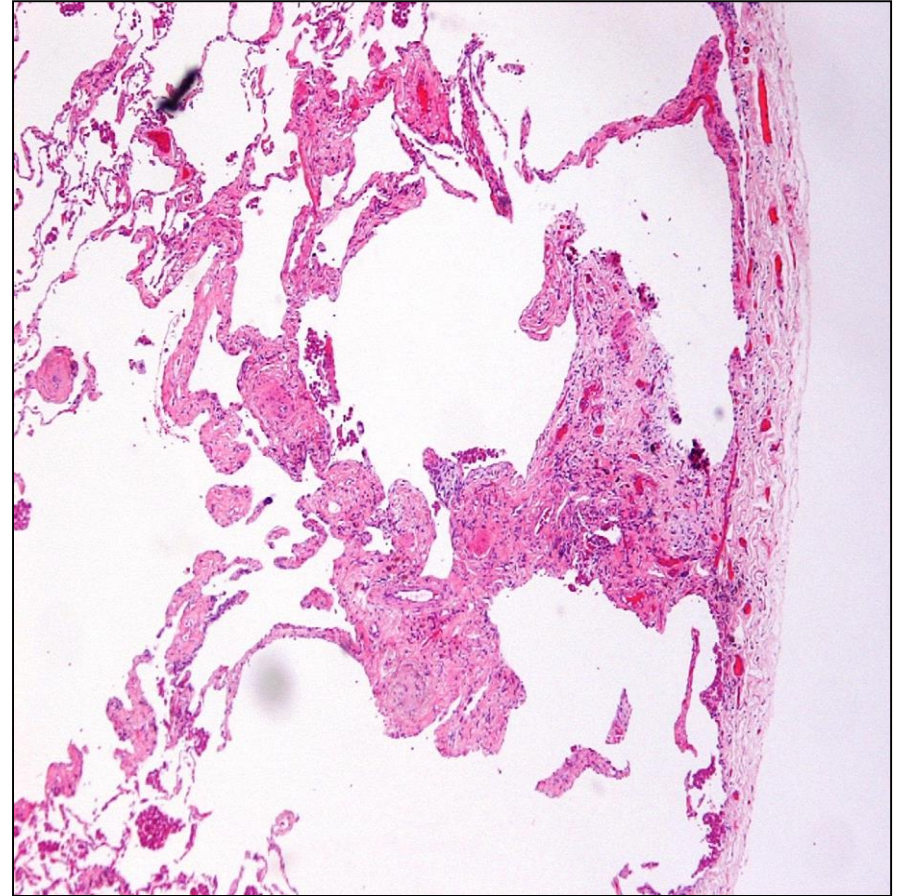
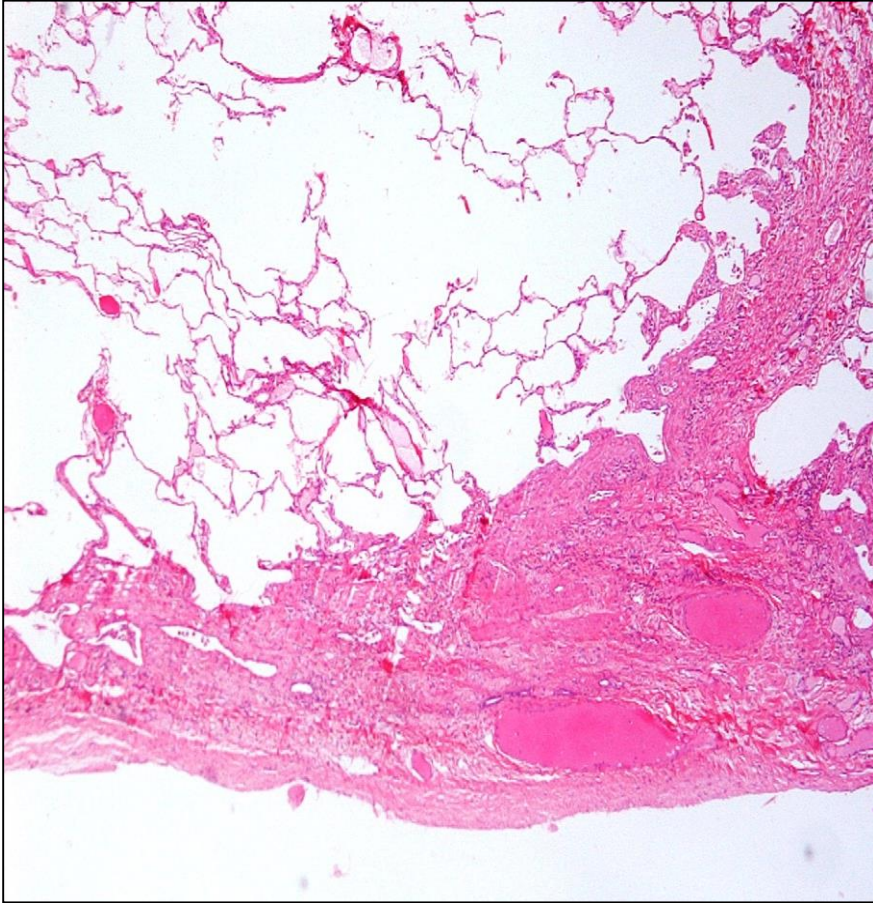
EOSINOPHILIC PNEUMONIA

CHURG-STRAUSS





# 4. SMOKING-RELATED LUNG FIBROSIS – SUBPLEURAL COLLAGENOUS FIBROSIS MARKED EMPHYSEMA

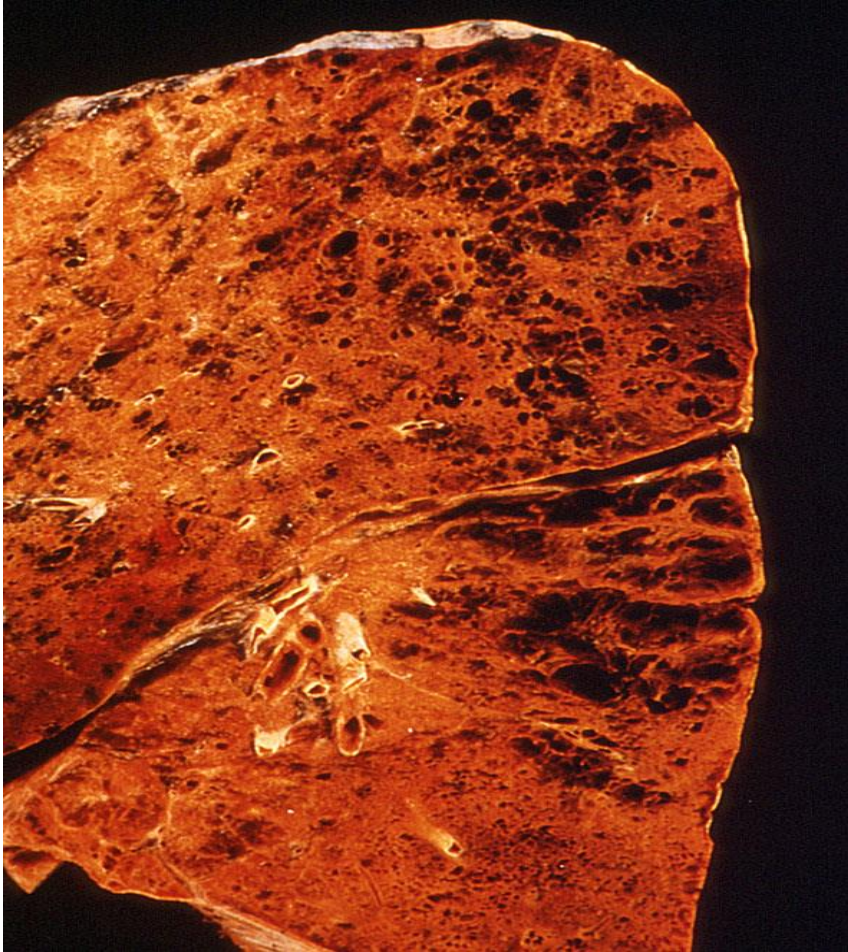




# Smoking related Pathology

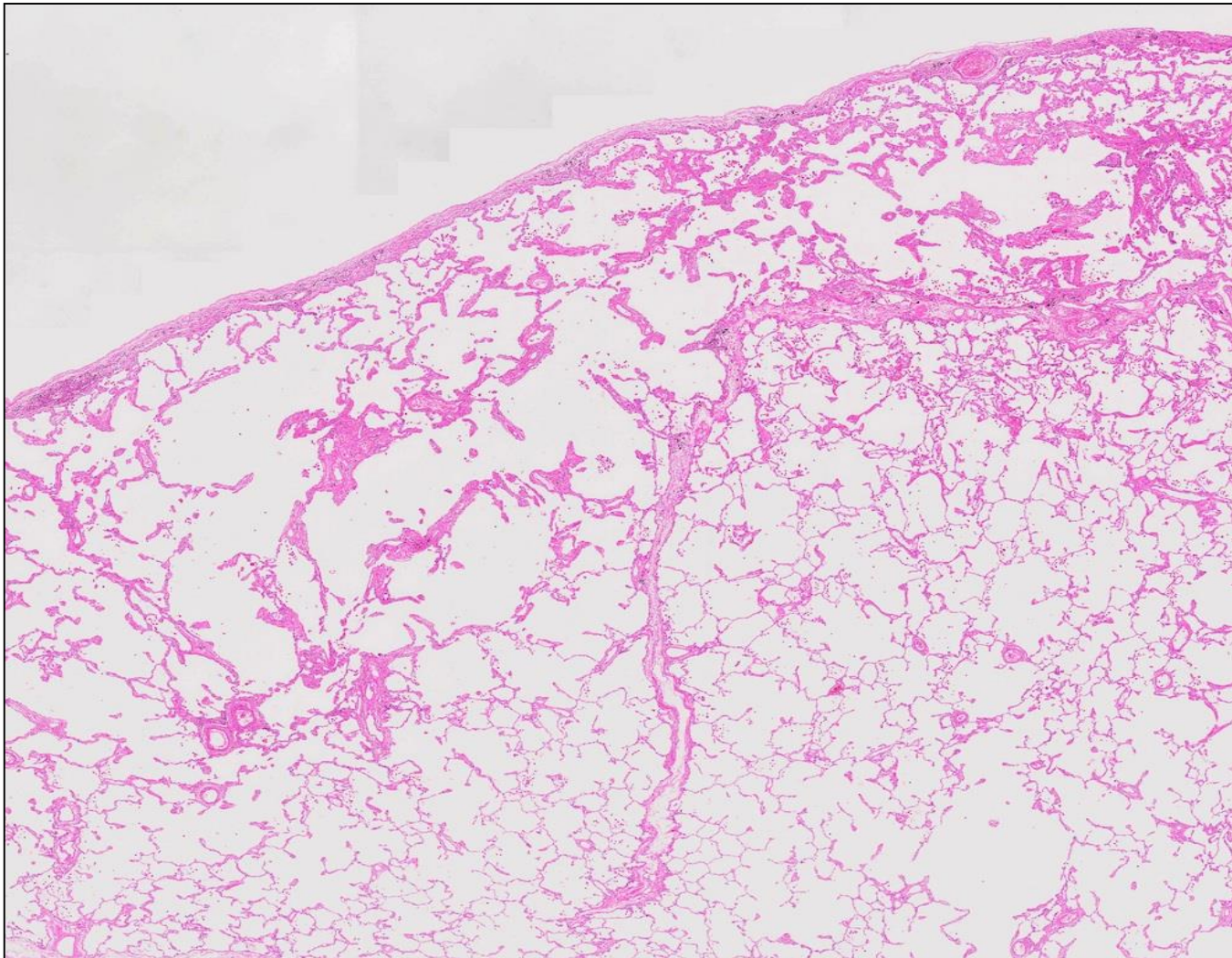
- Centrilobular emphysema
- Chronic bronchitis
- RB – ILD
- Desquamative interstitial pneumonia (DIP)
- Langerhans cell histiocytosis
- Pulmonary interstitial fibrosis/CPFE

# Centrilobular emphysema





# Emphysema

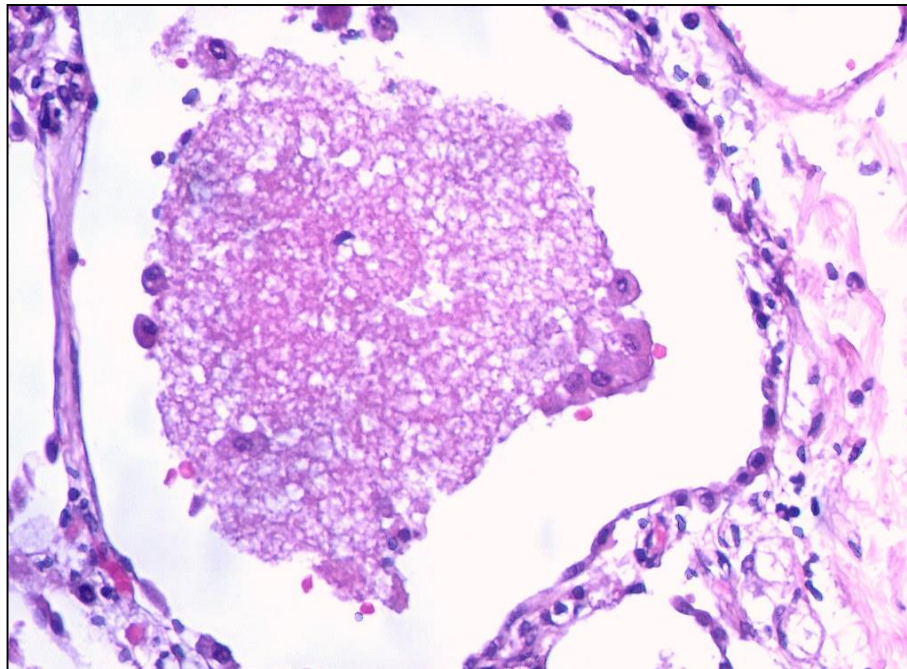
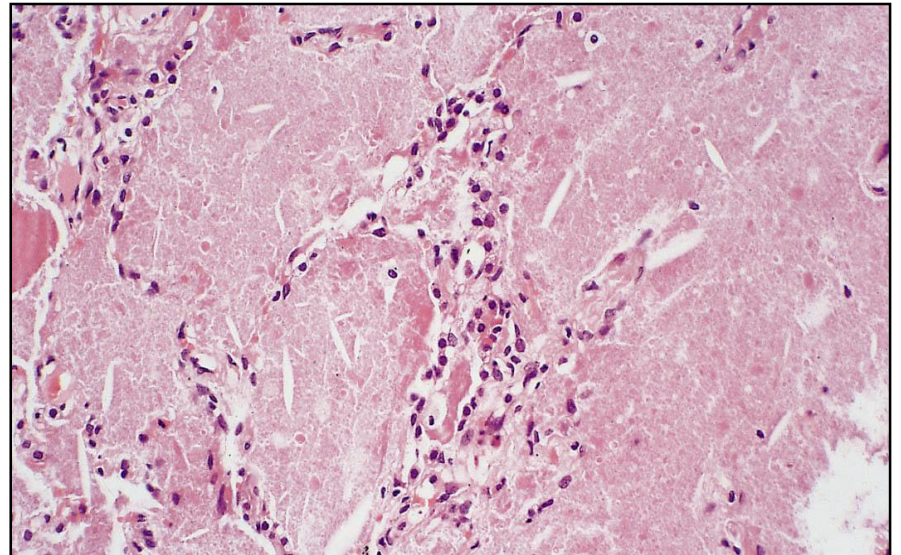
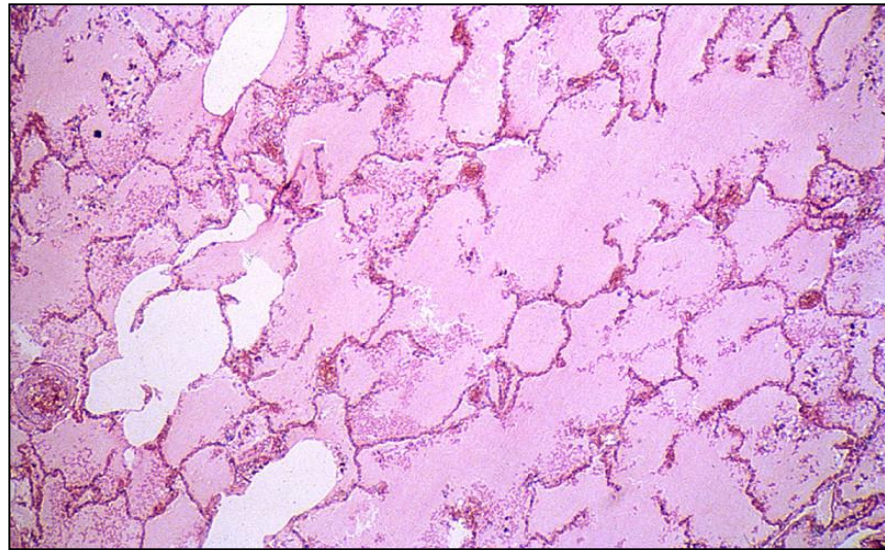


# Pattern based approach

- Acute lung injury
- Fibrosis
- Alveolar filling/Air-space pathology
- Chronic Cellular infiltrates
- Nodules
- Near Normal Lung

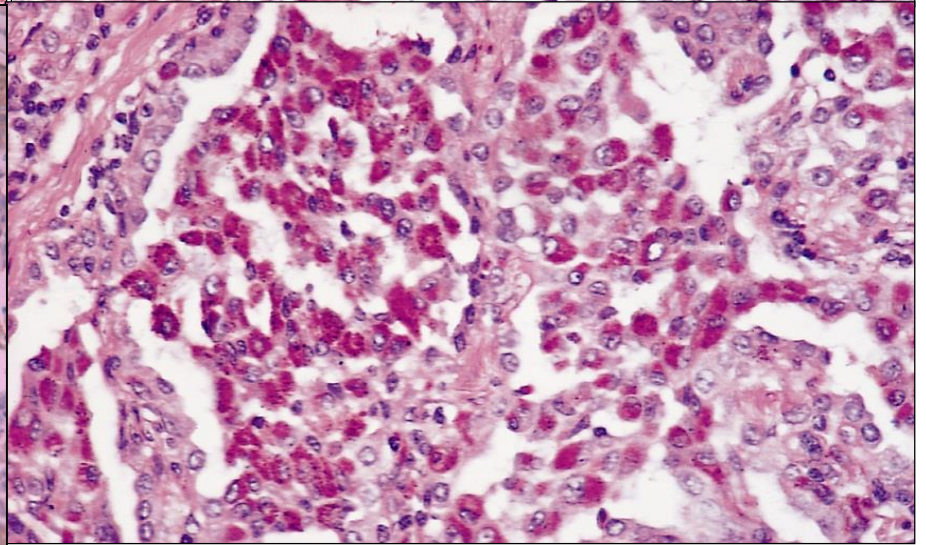
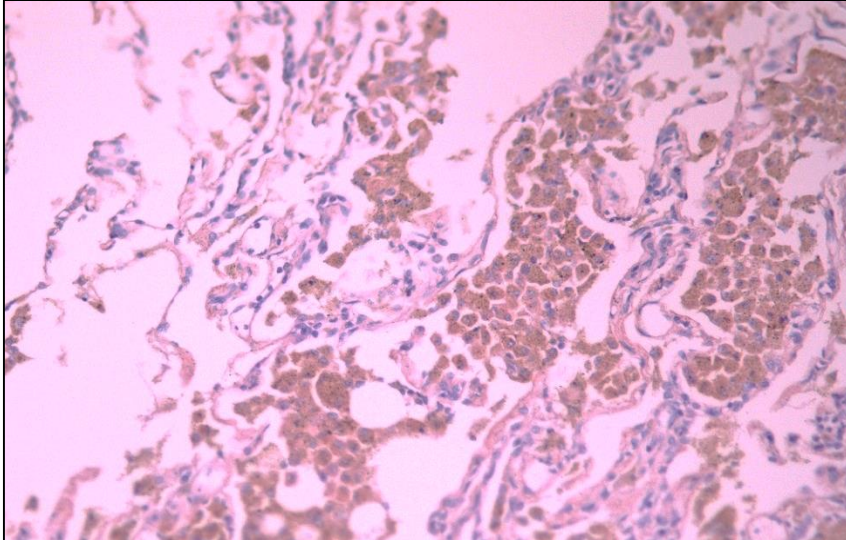
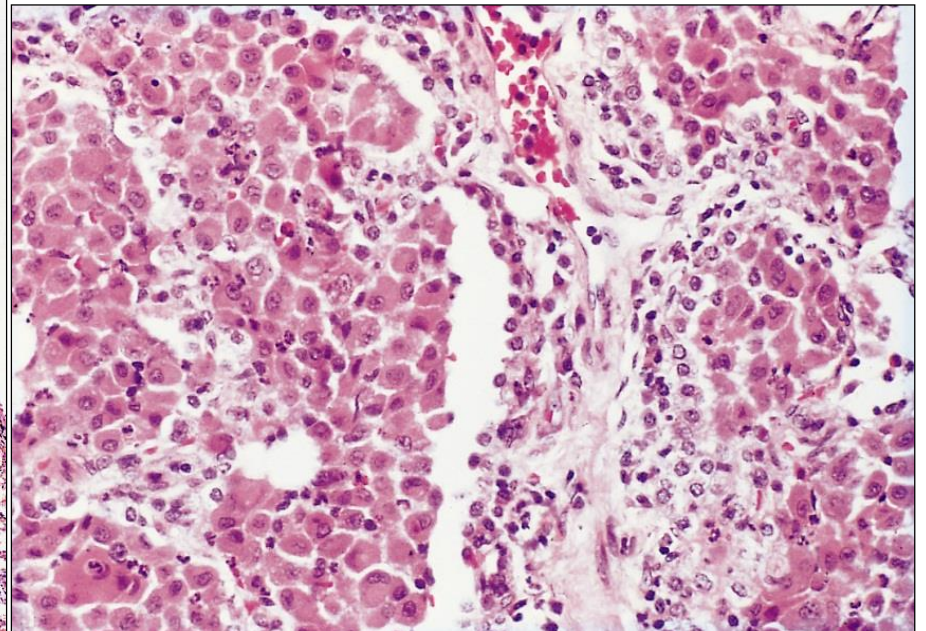
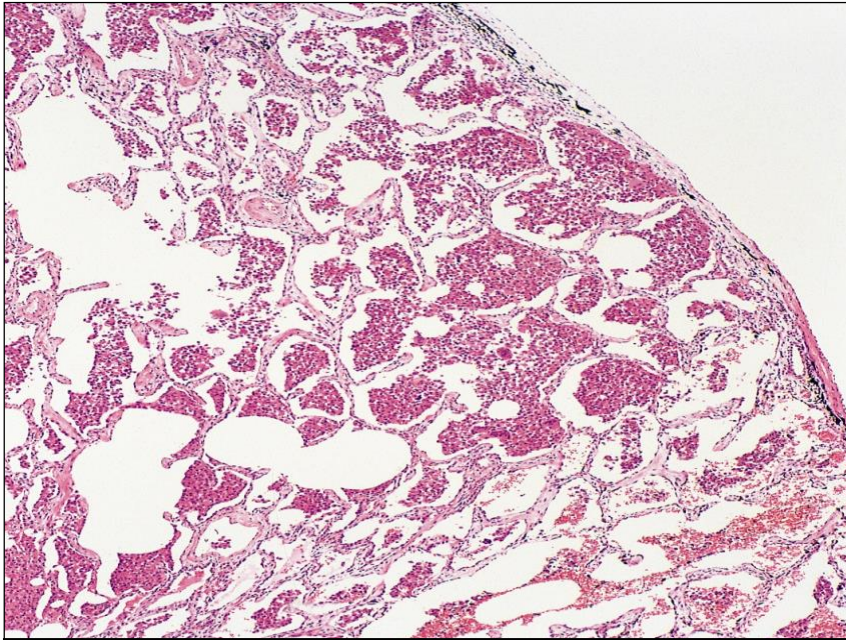


# ALVEOLAR FILLING DISORDERS – ‘ACELLULAR’





# Desquamative Interstitial Pneumonia



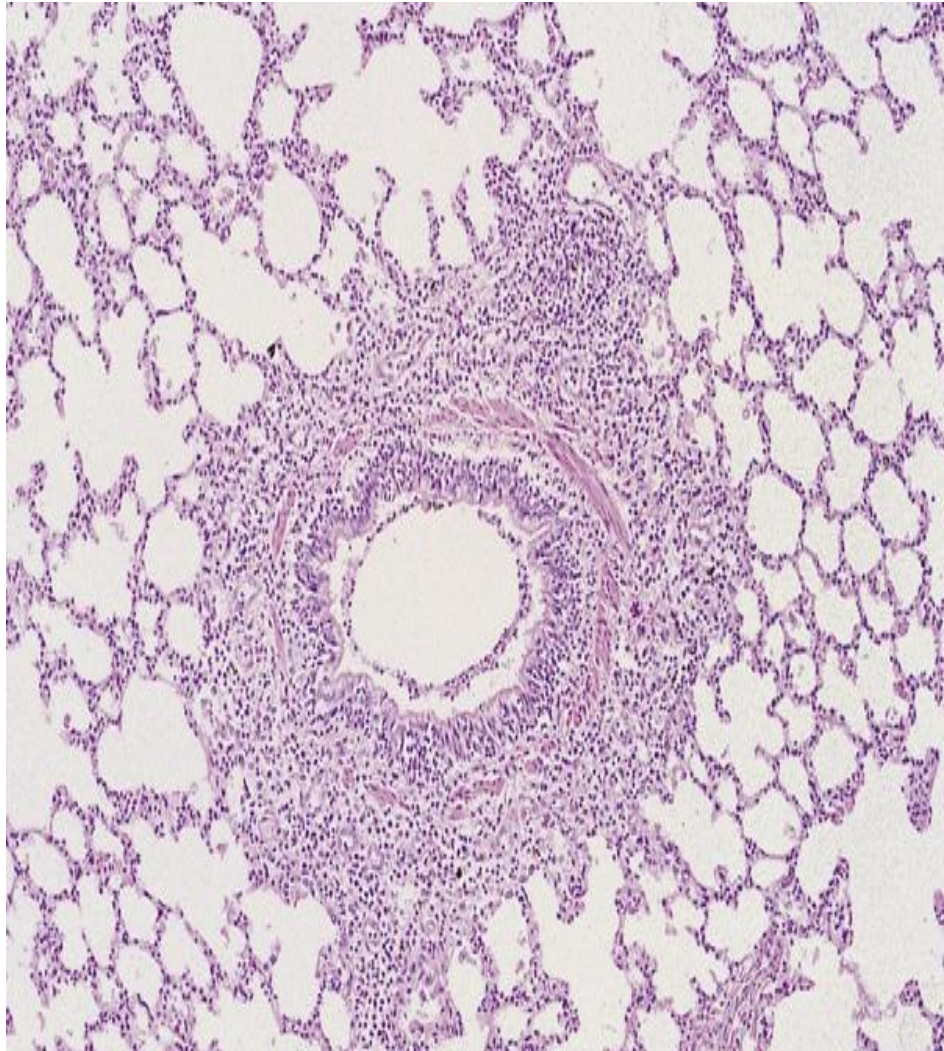


# Pattern based approach

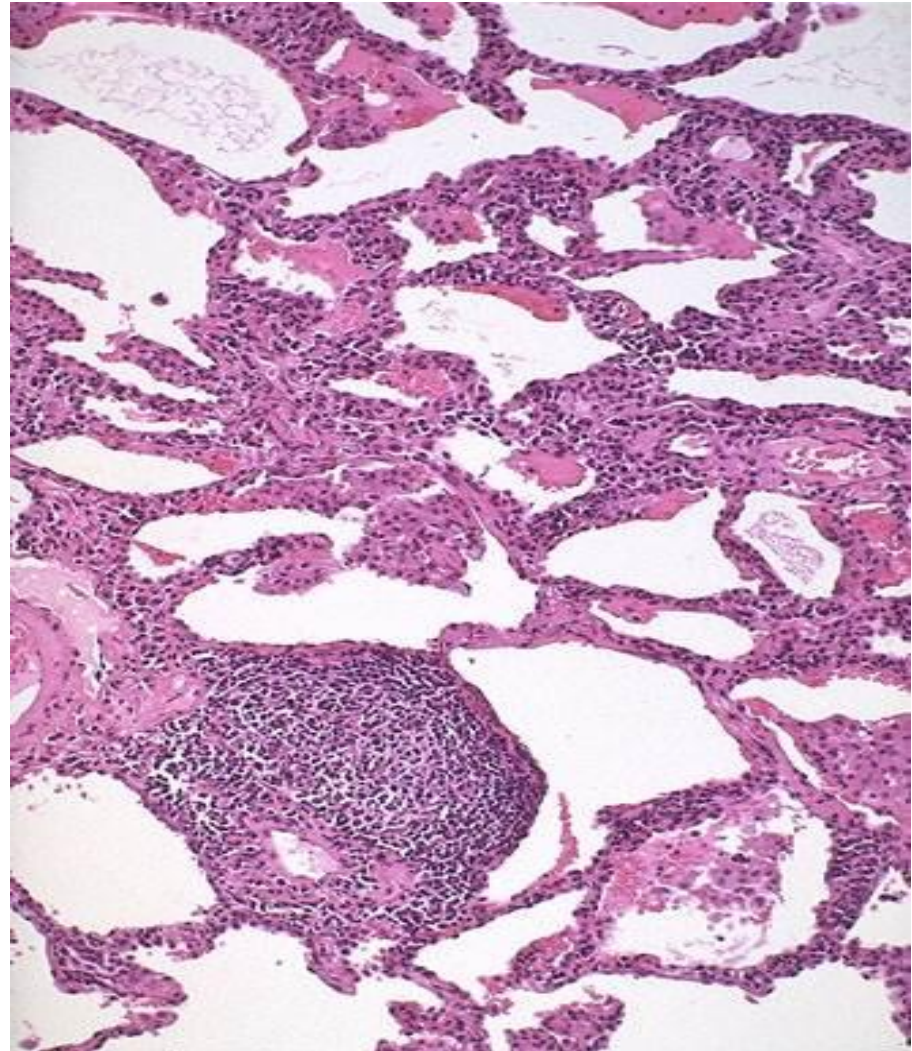
- Acute lung injury
- Fibrosis
- Alveolar filling/Air-space pathology
- **Chronic Cellular infiltrates**
- Nodules
- Near Normal Lung

## PATTERN - CHRONIC CELLULAR INFILTRATES

Acute Viral Bronchiolitis



Lymphocytic Interstitial Pneumonia/Lymphoma





# Pattern based approach

- Alveolar filling pathology
- Acute lung injury
- Fibrosis
- Chronic Cellular infiltrates
- **Nodules**
- Near Normal Lung
- Pleural pathology

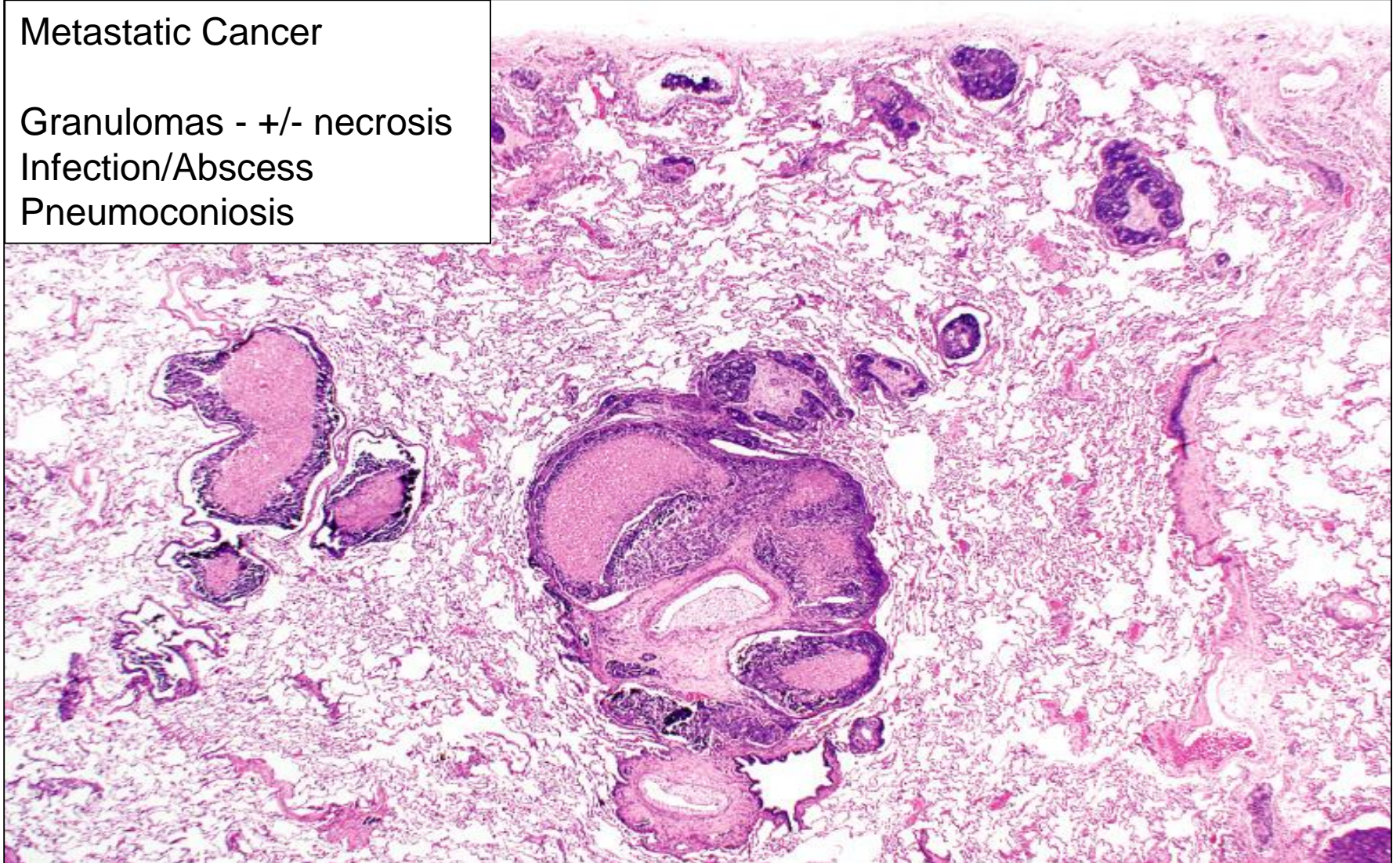
# Pattern – Lung Nodules

Metastatic Cancer

Granulomas - +/- necrosis

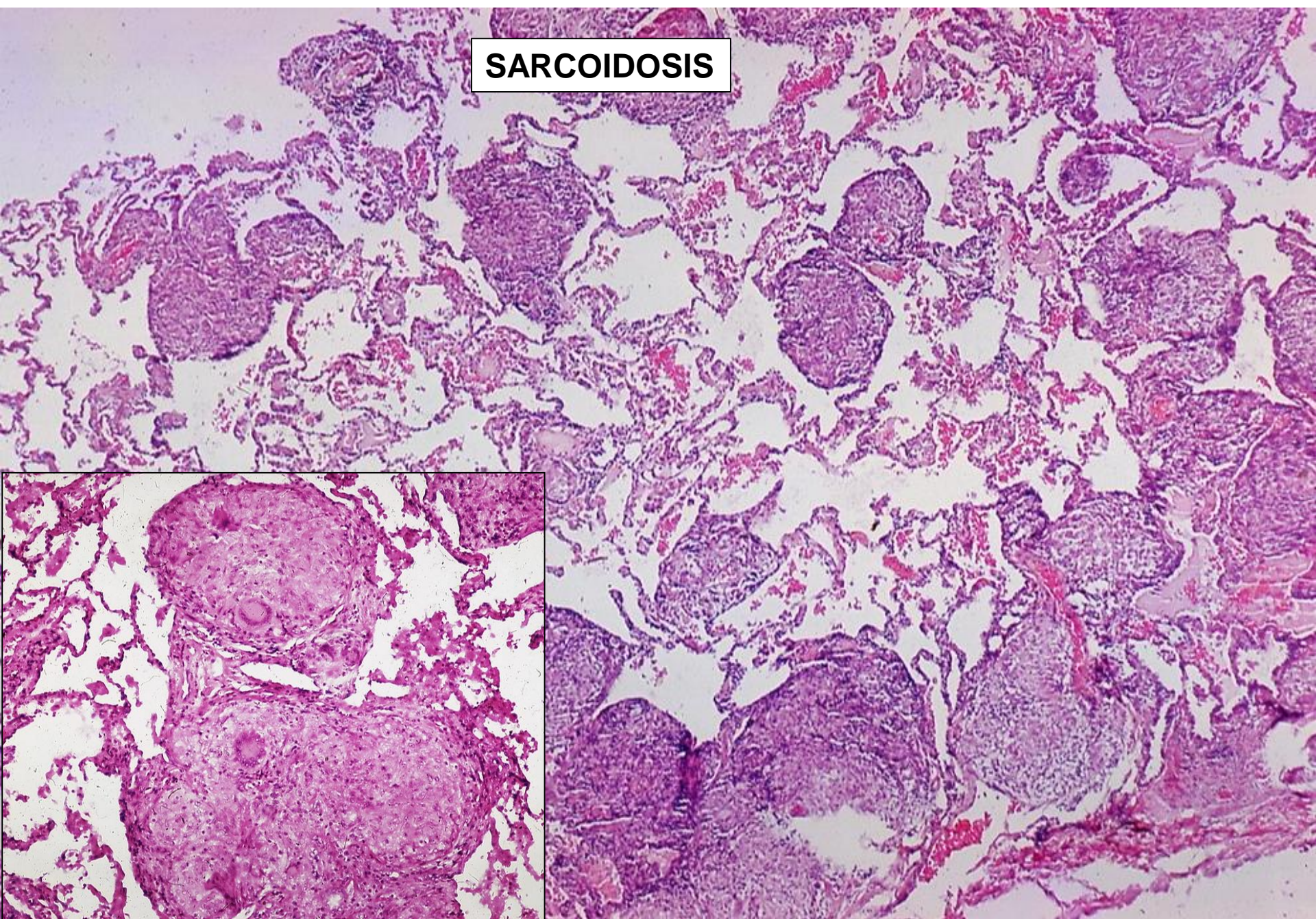
Infection/Abscess

Pneumoconiosis





**SARCOIDOSIS**



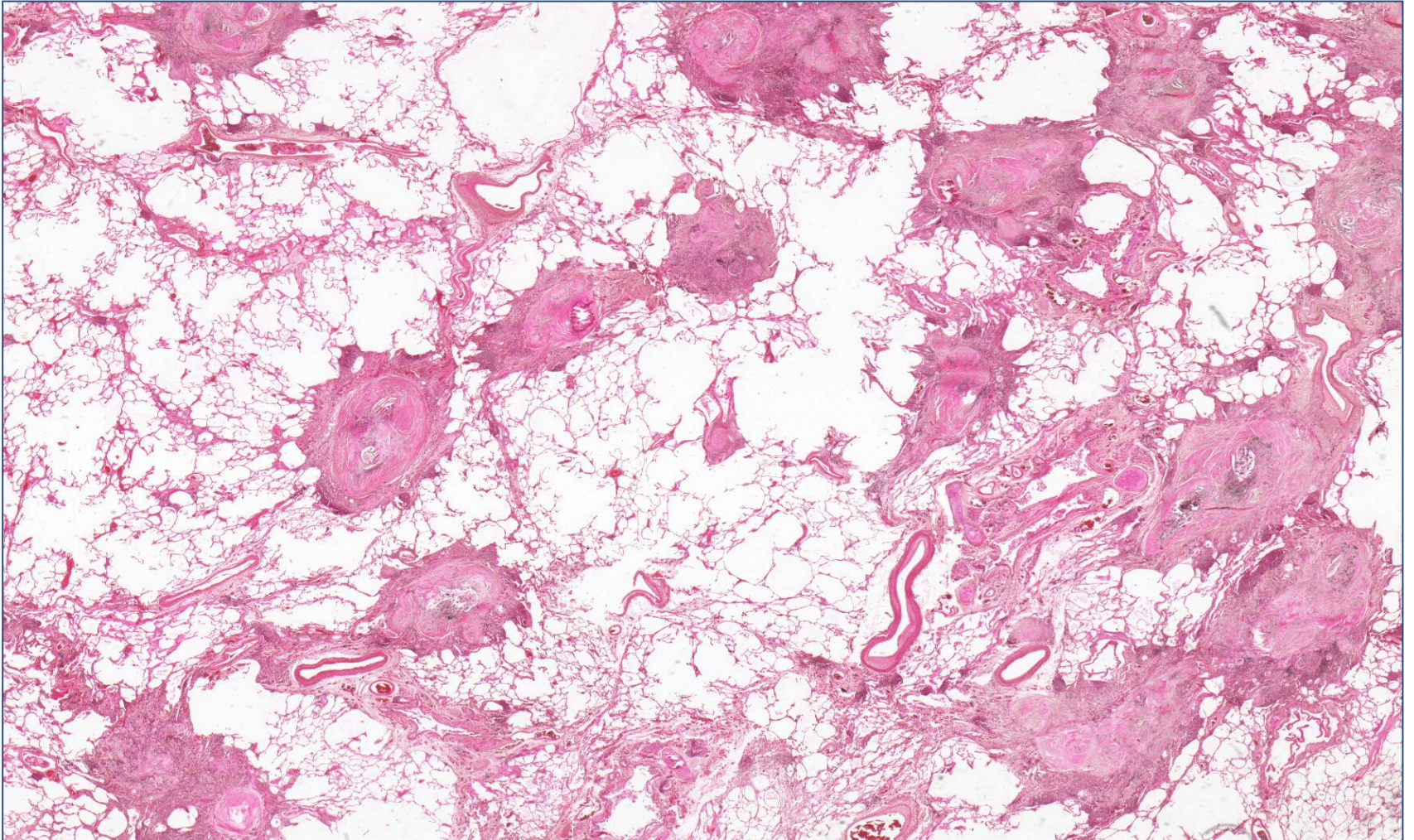


# Silicosis – Gough Wentworth





# NODULAR SILICOSIS



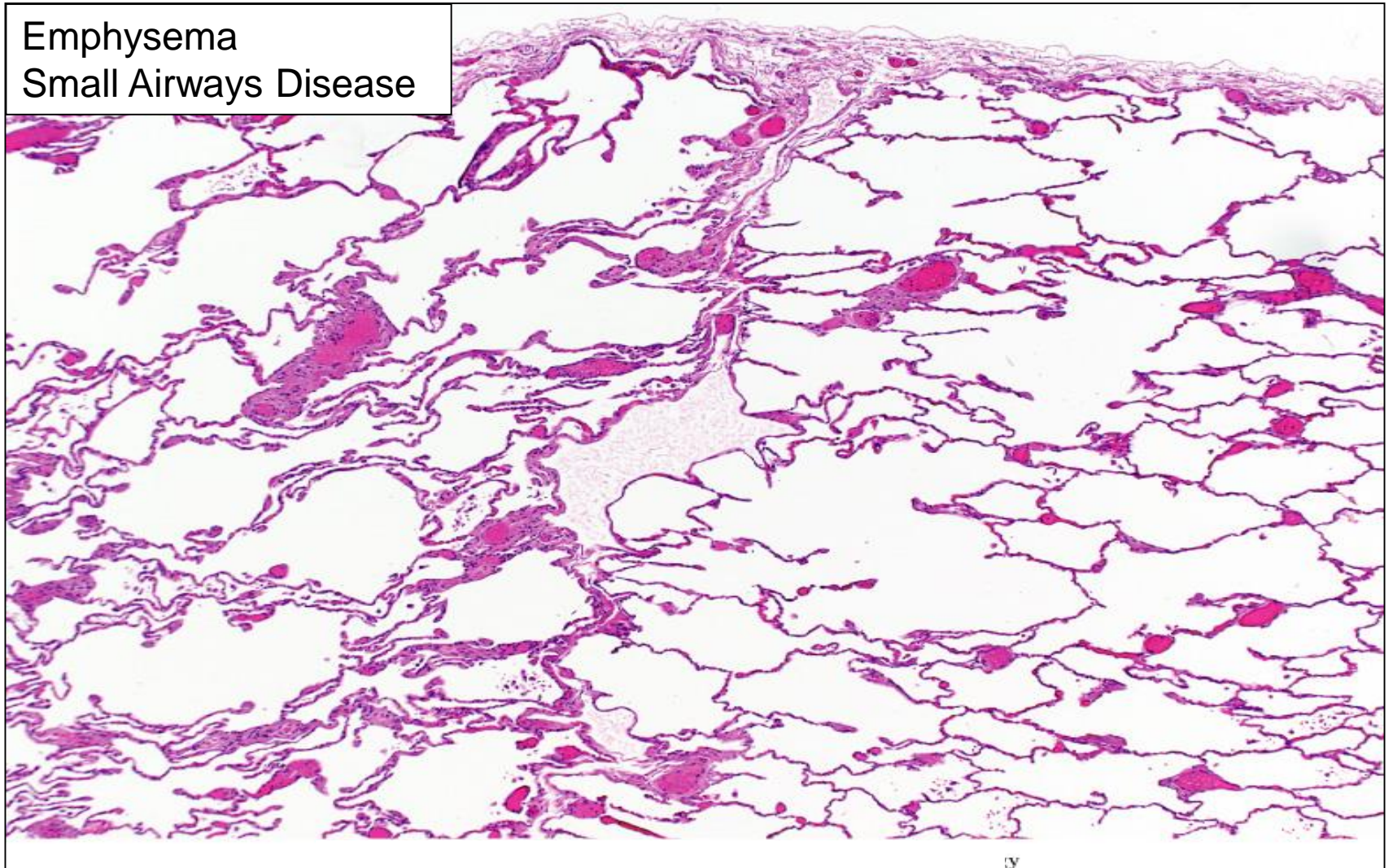
# Pattern based approach

- Alveolar filling pathology
- Acute lung injury
- Fibrosis
- Chronic Cellular infiltrates
- Nodules
- **Near Normal Lung**



# Pattern 6 – Near Normal lung

Emphysema  
Small Airways Disease



# LUNG BIOPSY

- Pattern recognition is the start
  - Not disease diagnosis
- Consider clinical history/Lab findings & Imaging
  - - DISCUSS IN MDT
- Be aware atypical cases -> biopsy
- Be aware pitfalls
  - Pure patterns uncommon
  - Mixed patterns, eosinophils – think drugs!



Thanks