

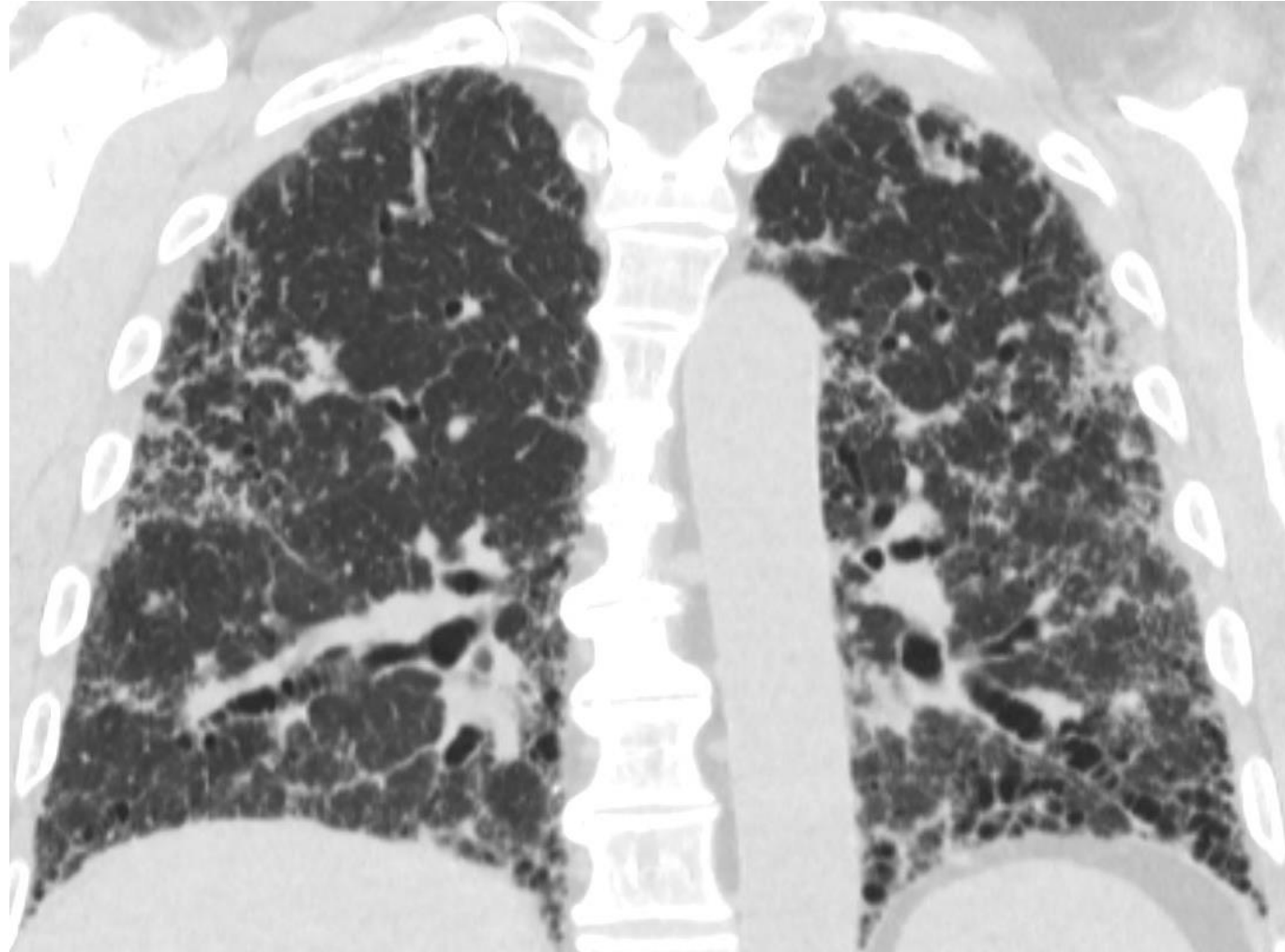
# HRCT Patterns and Pitfalls:

## Approach to Fibrotic Lung Disease

**Amita Sharma**

Thoracic Imaging and Intervention

Massachusetts General Hospital



# Objectives

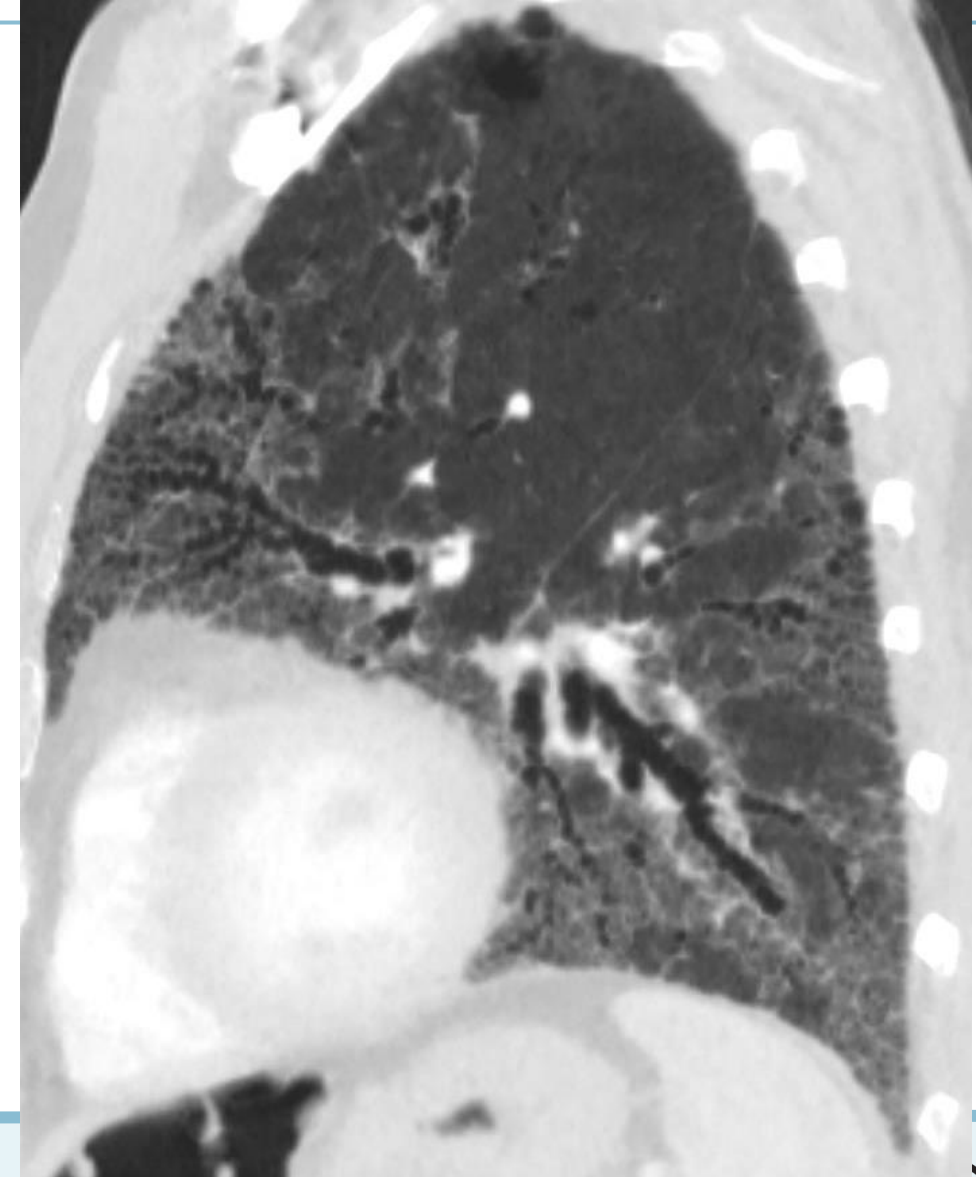
Discuss Pitfalls in CT diagnosis of  
Fibrotic ILD

Technical Factors

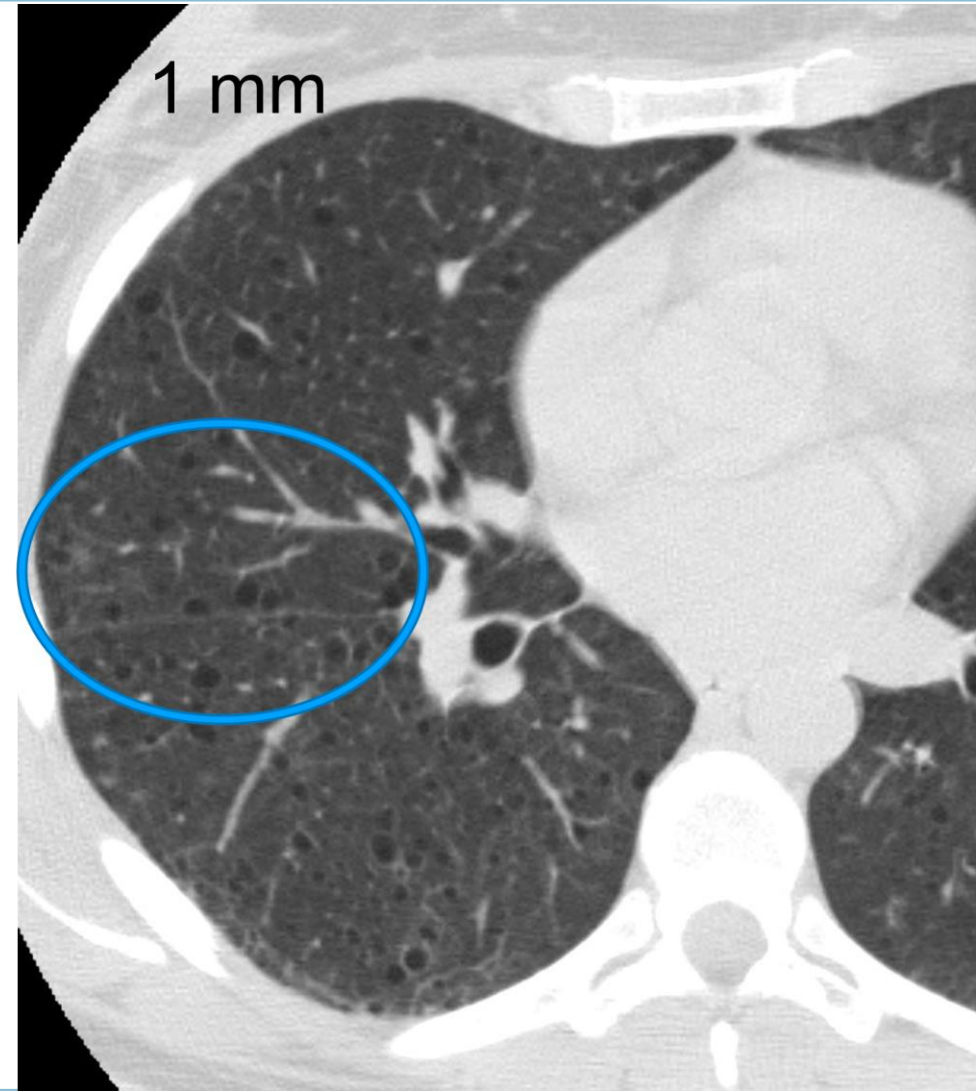
Physiology VS Pathology

CT Signs of Fibrosis

Pitfalls of Radiologic Signs



# Technical Factors: Slice Thickness

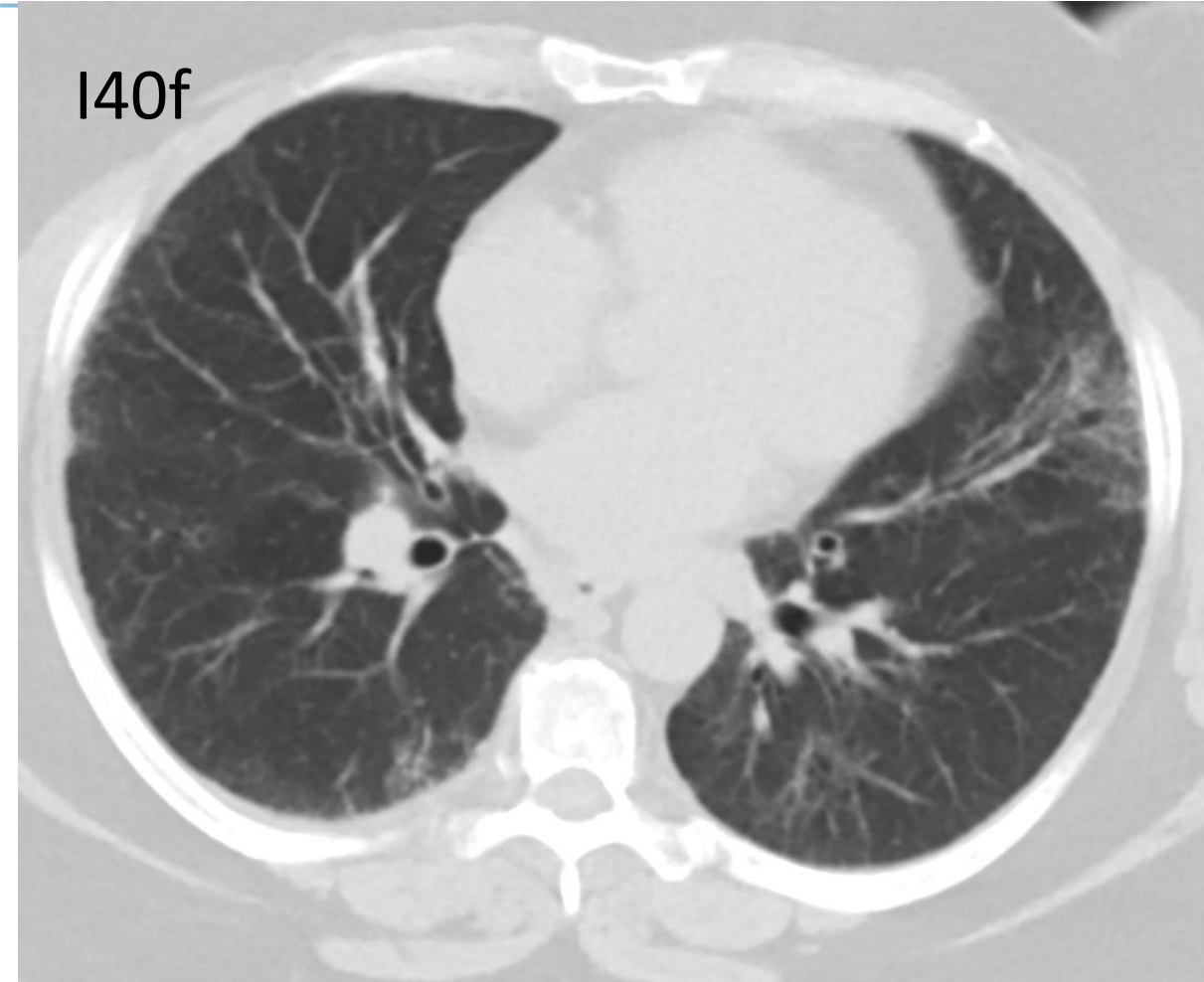


Thin slice reduces partial volume averaging

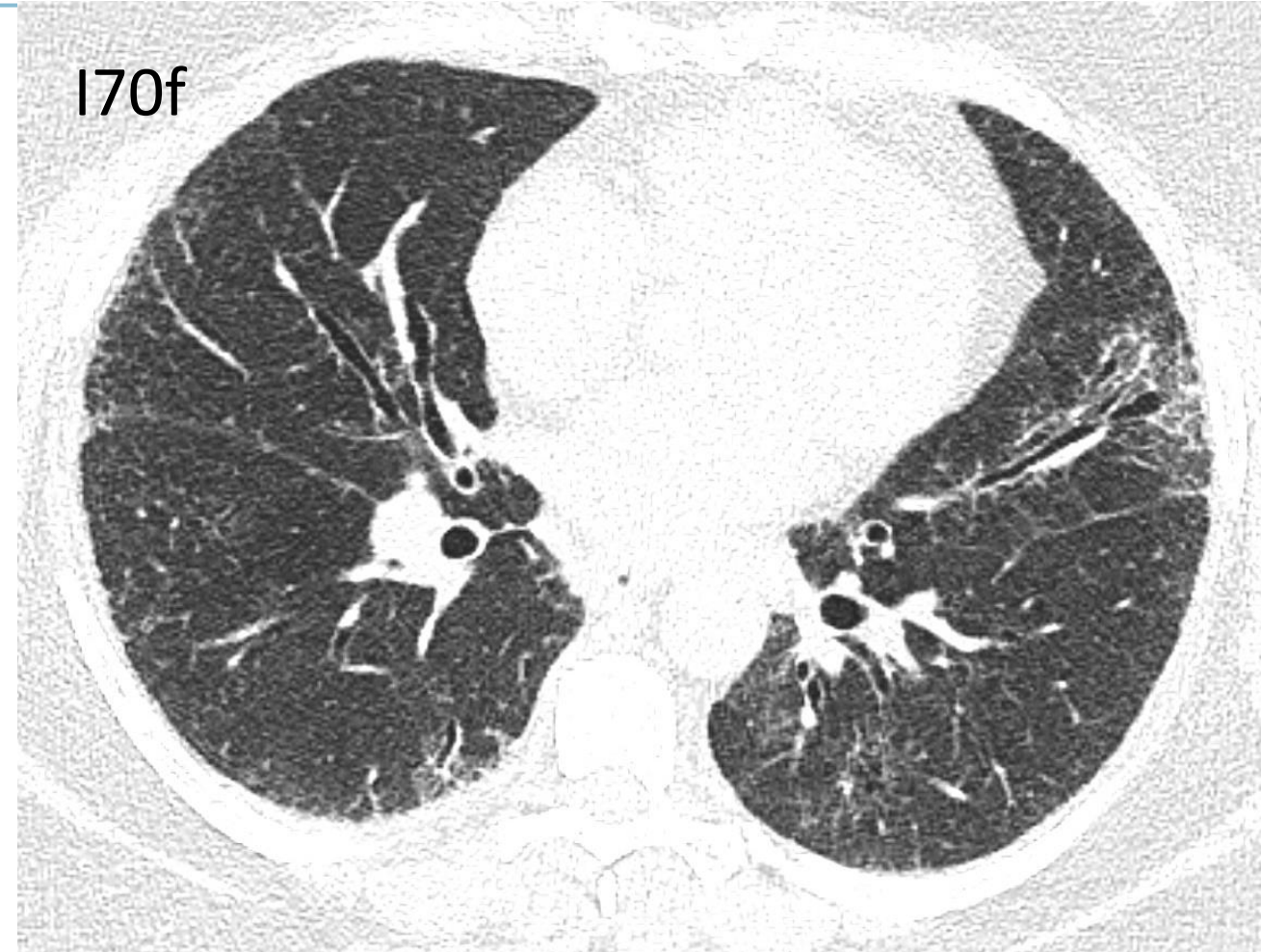


# Technical Factors: Reconstruction Kernel

140f



170f



# Technical Factors: Reconstruction Kernel



Extra sharp can increase noise and artefacts



# Technical Factors: Low Dose

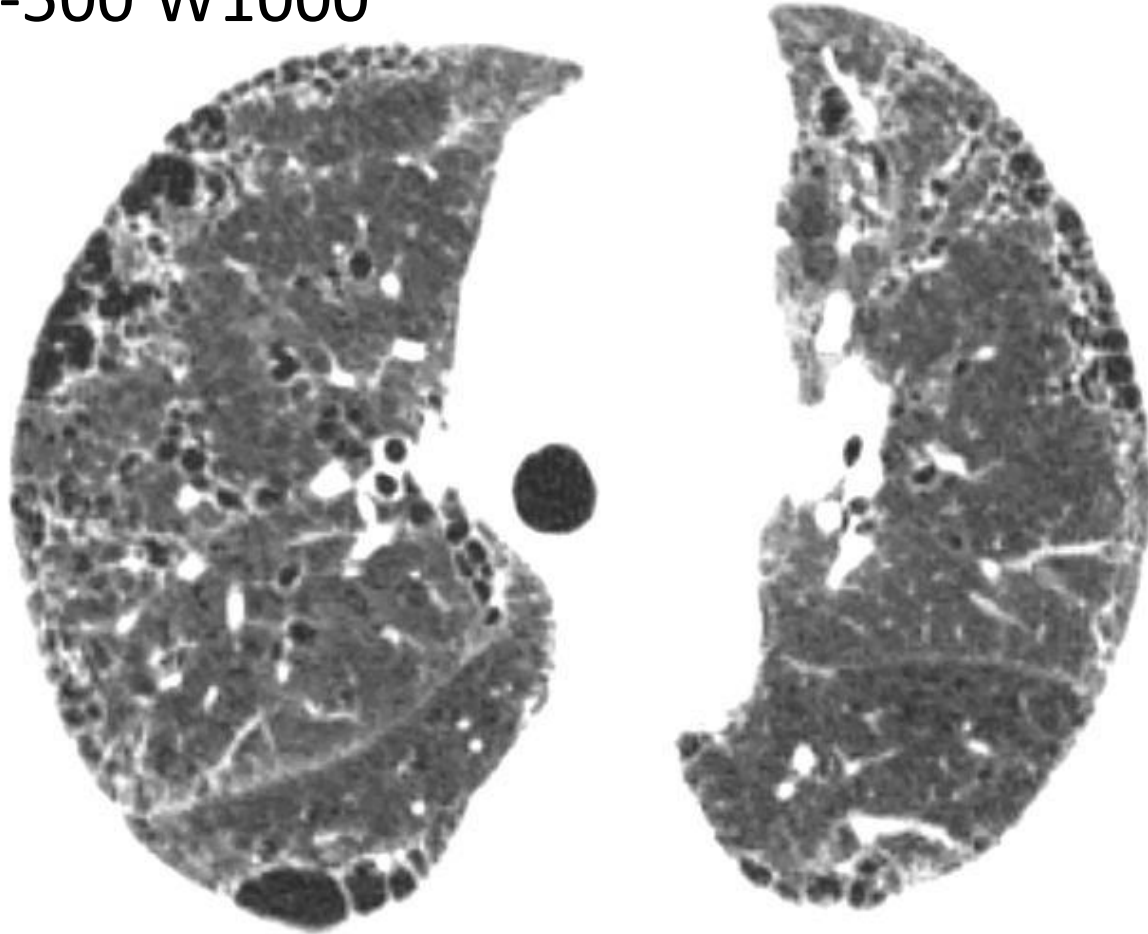
CTDIvol 1.5mGy



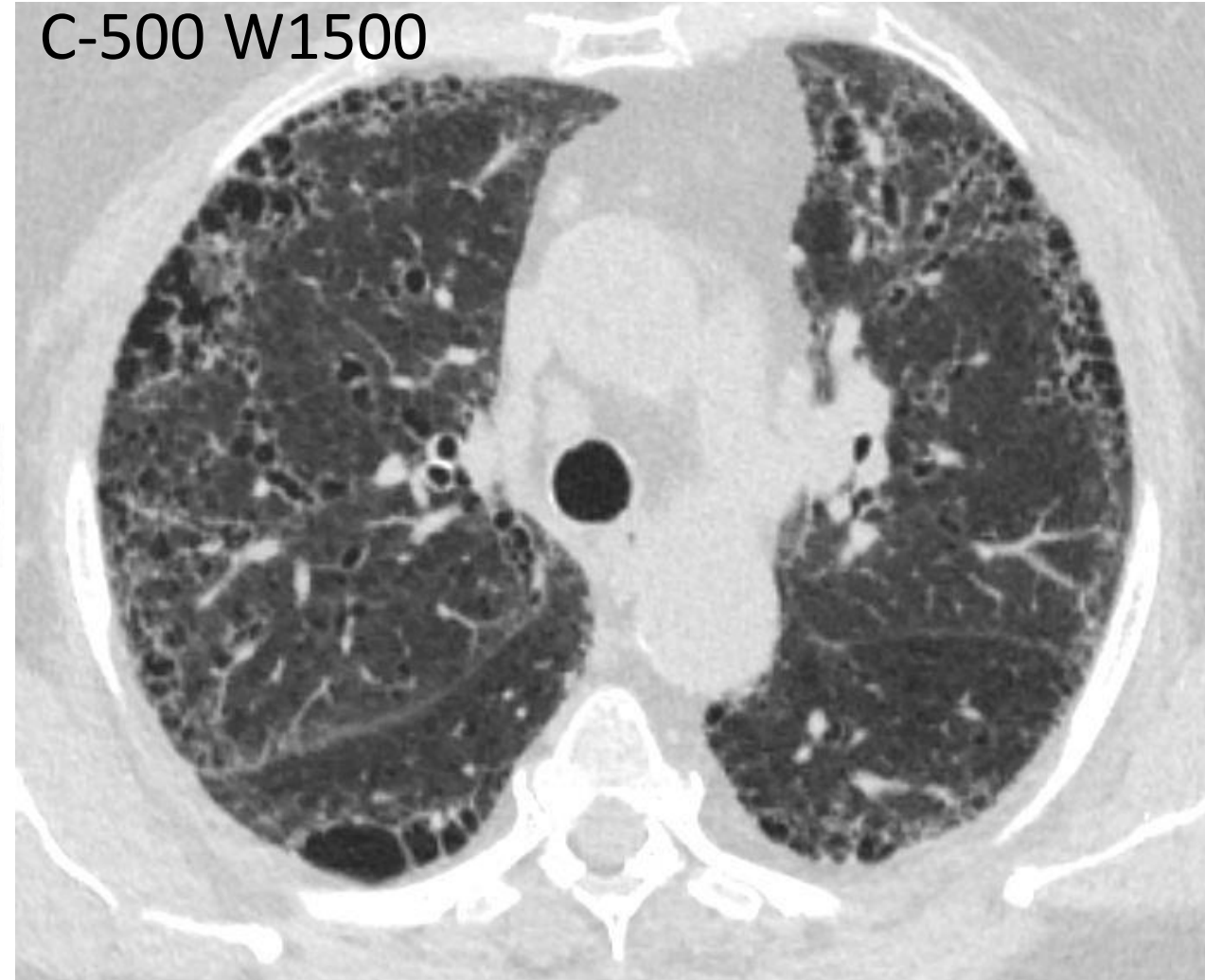
 Lung inherent contrast enables low dose imaging

# Technical Factors: Window Level

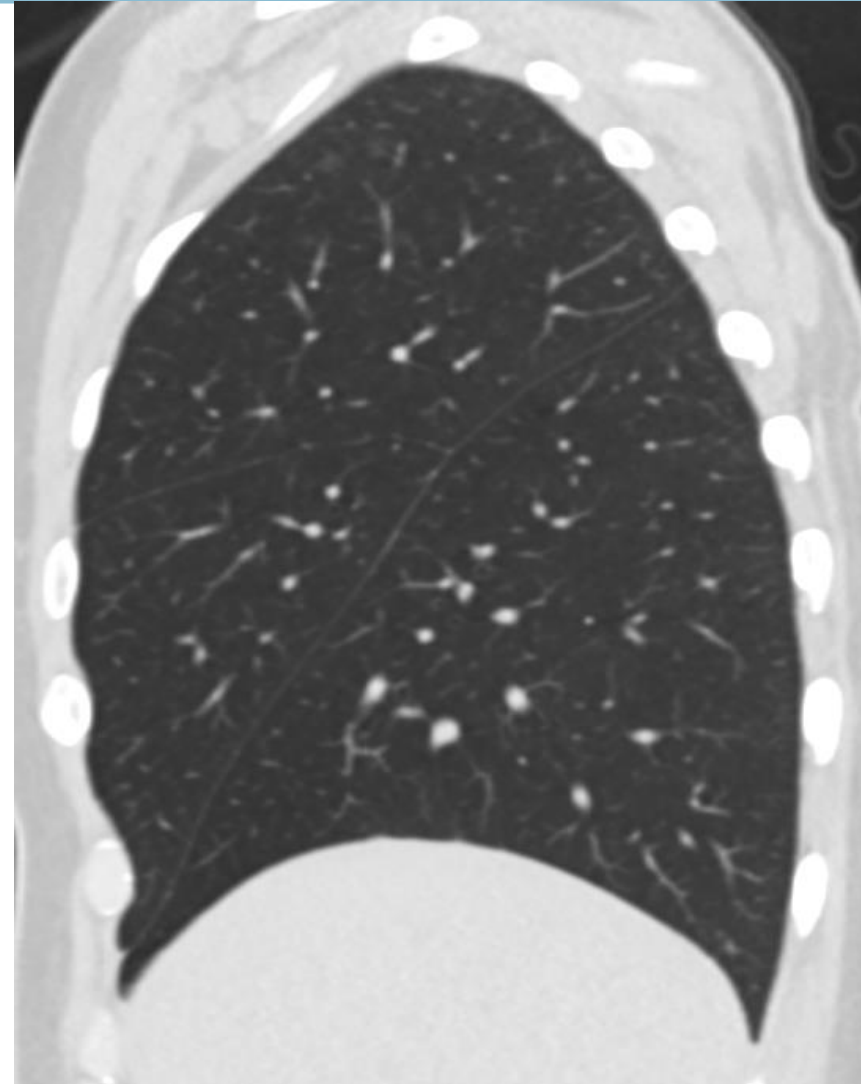
C-500 W1000



C-500 W1500



# Pathology VS Physiology

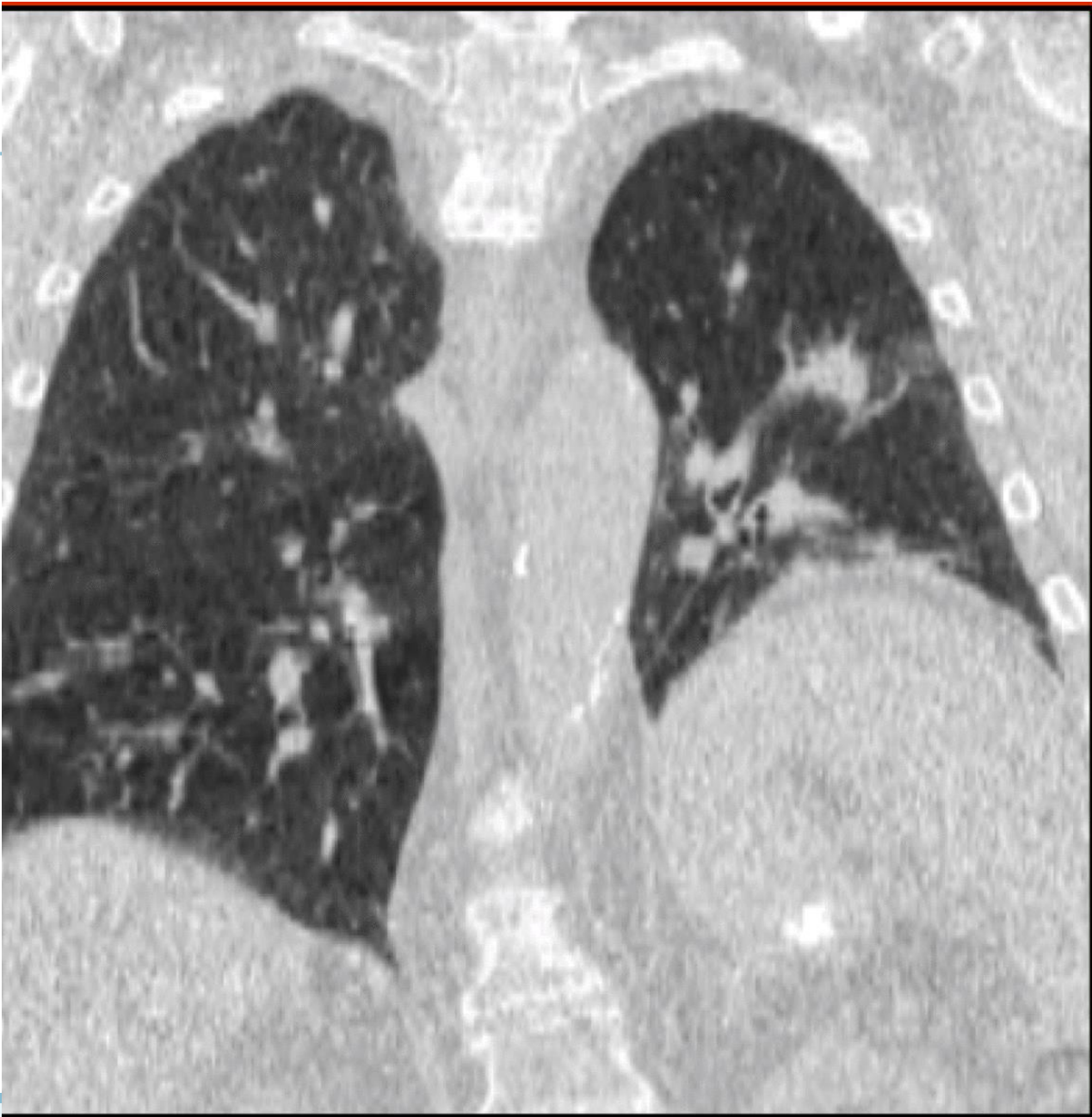


 Motion

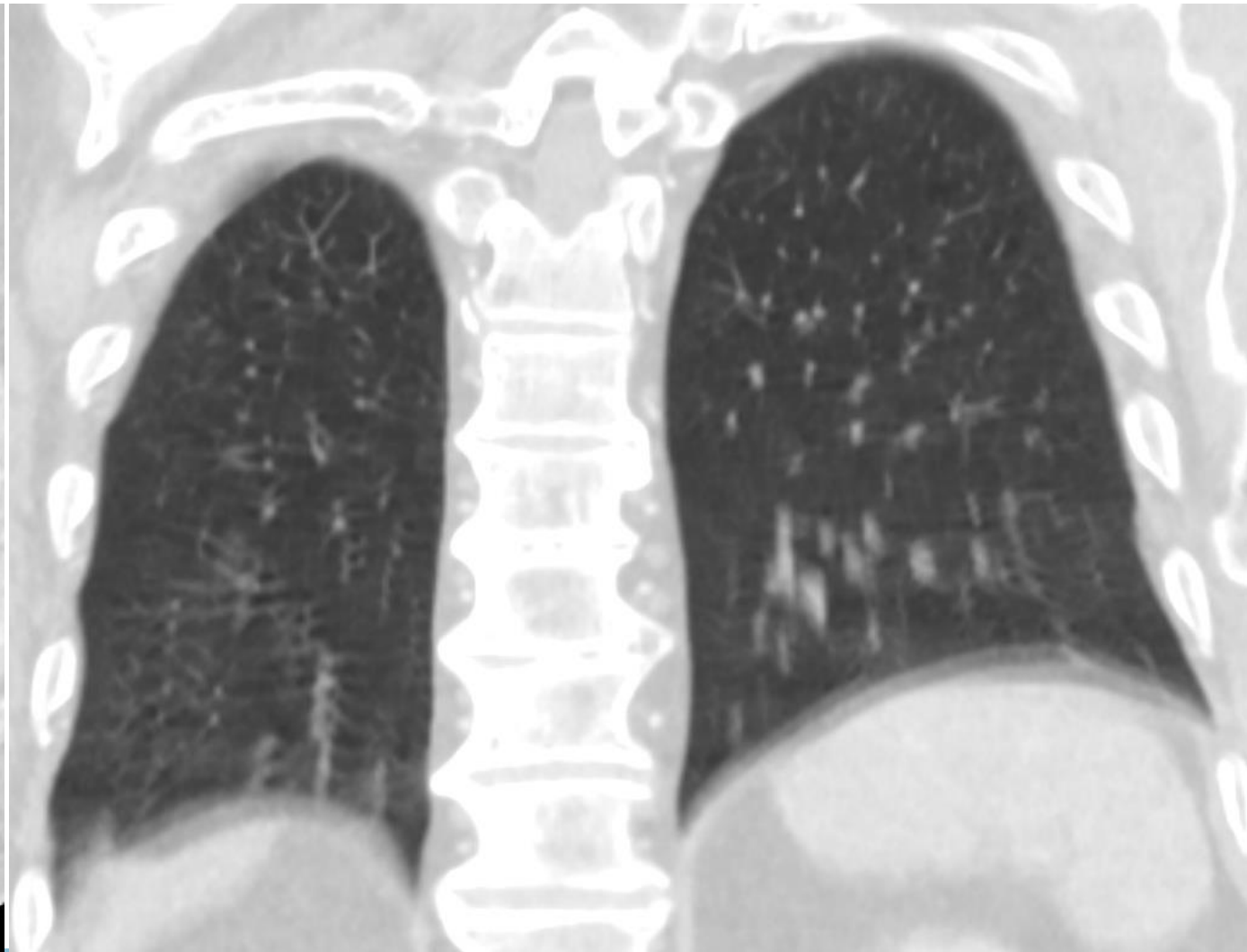
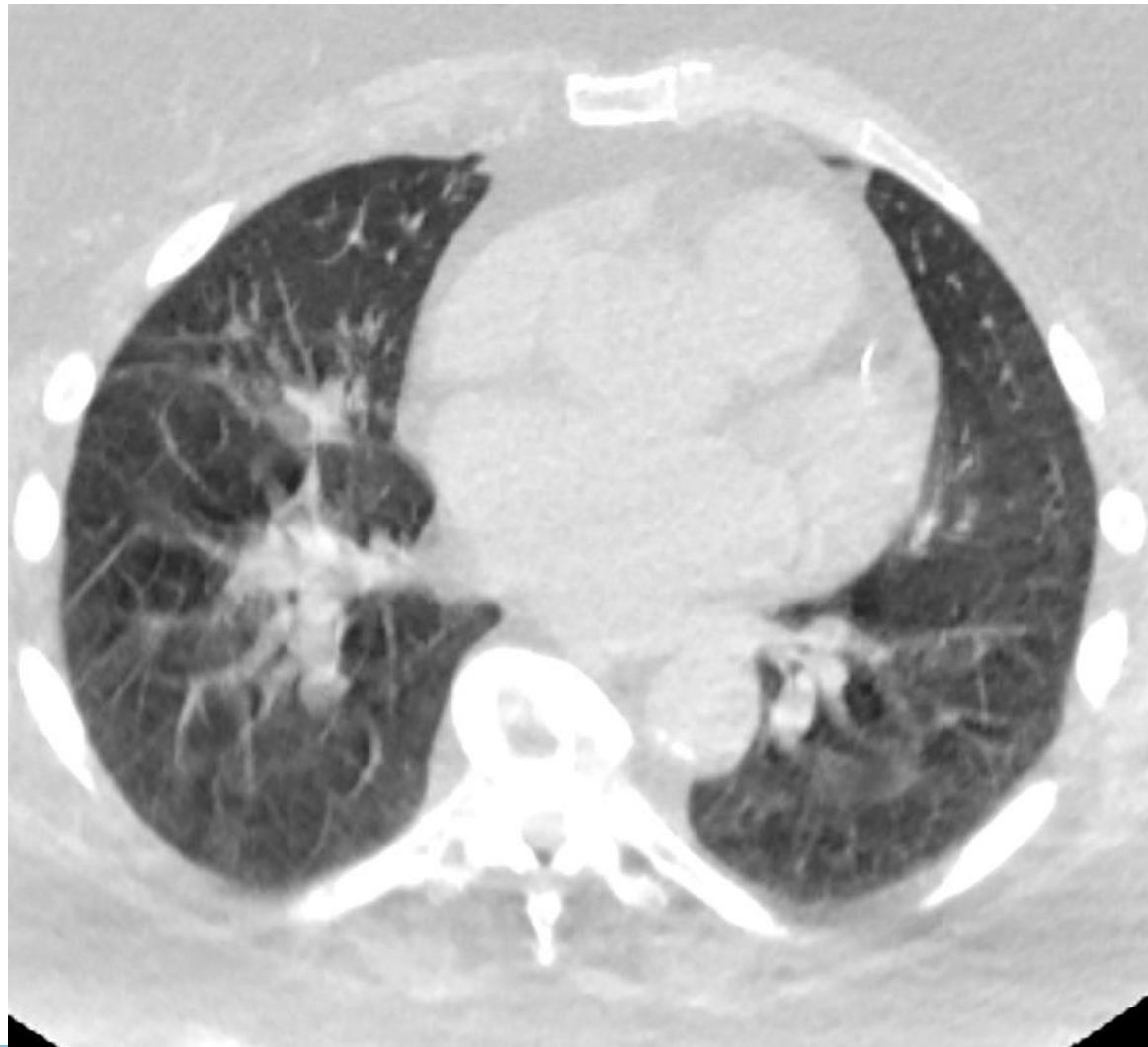
Dependent Density

Expiration

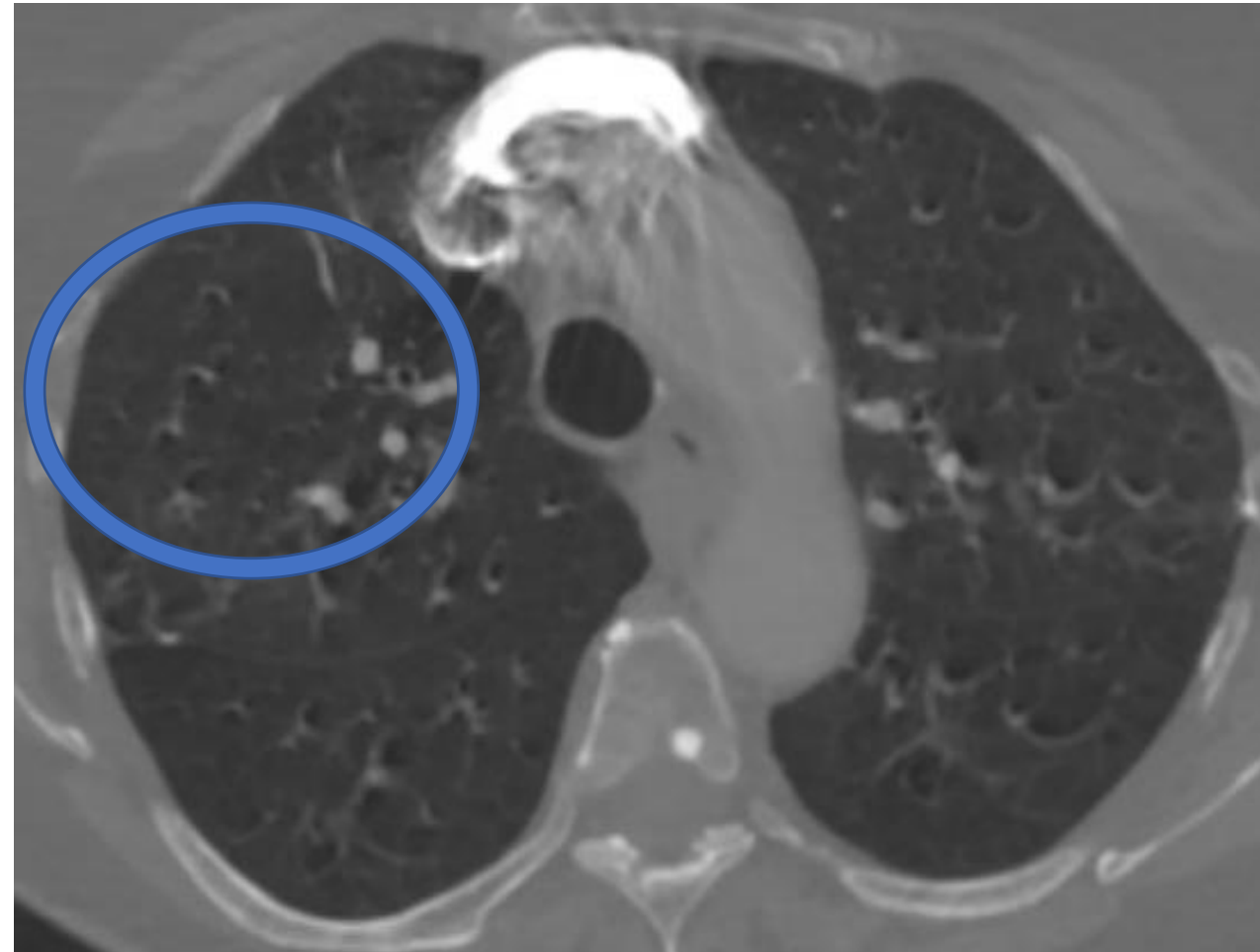
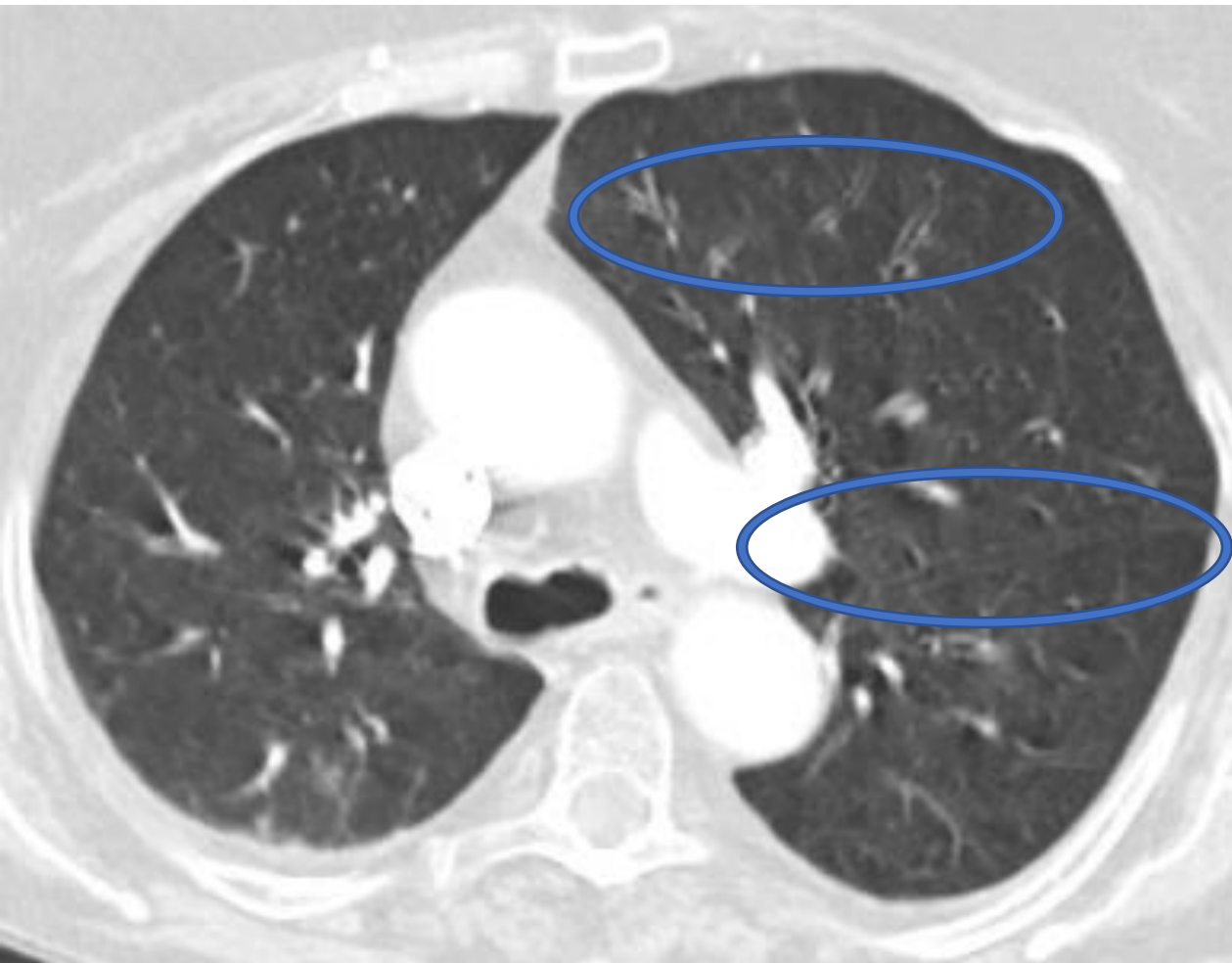




# Pathology VS Physiology: Motion

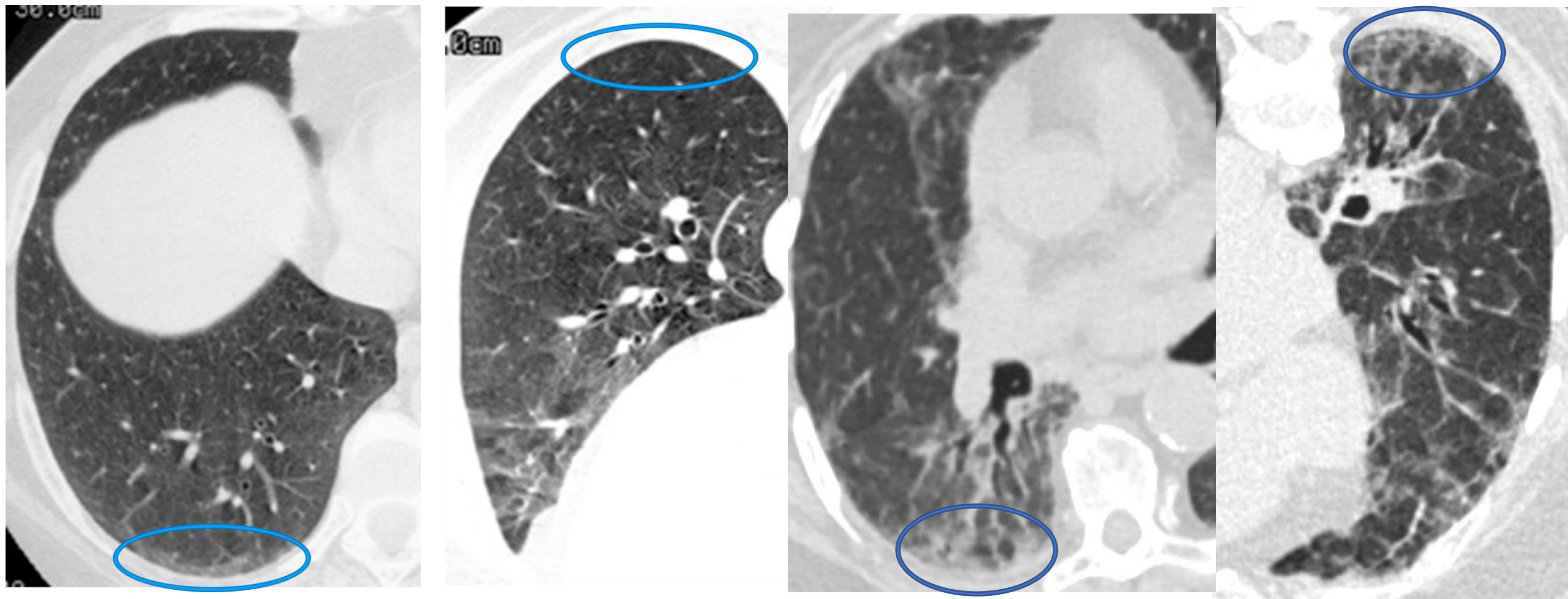


# Motion mimics disease





# Pathology VS Physiology: Dependent Density



50-100 HU AP gradient difference

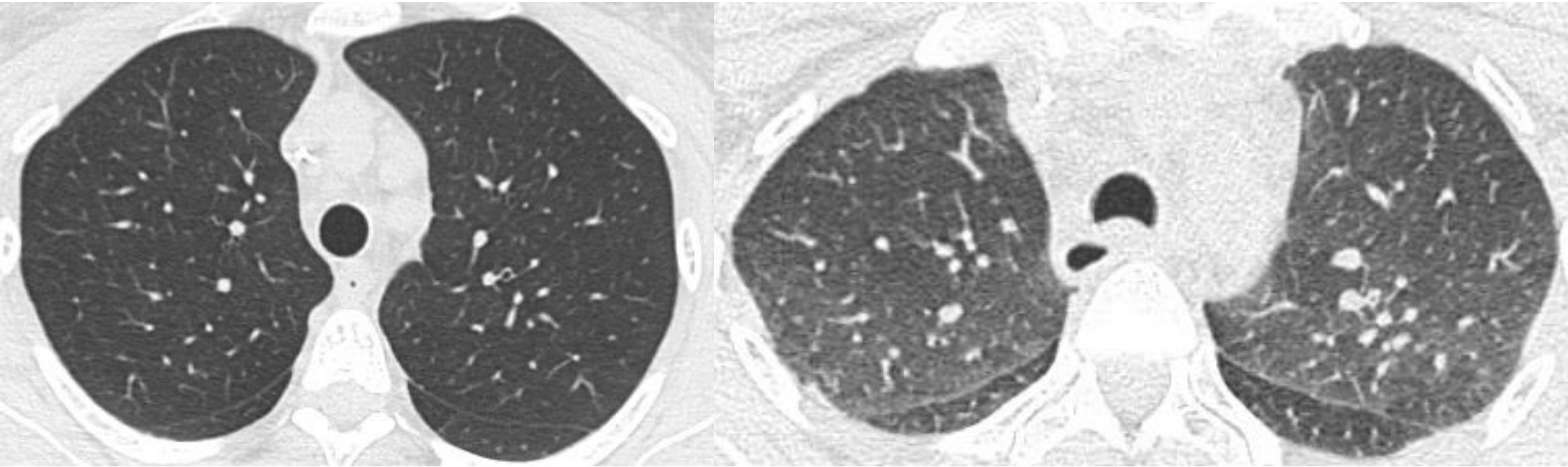
Rosenblum et al, Rad 1980; 137 (2): 409-416



# Pathology or Physiology?

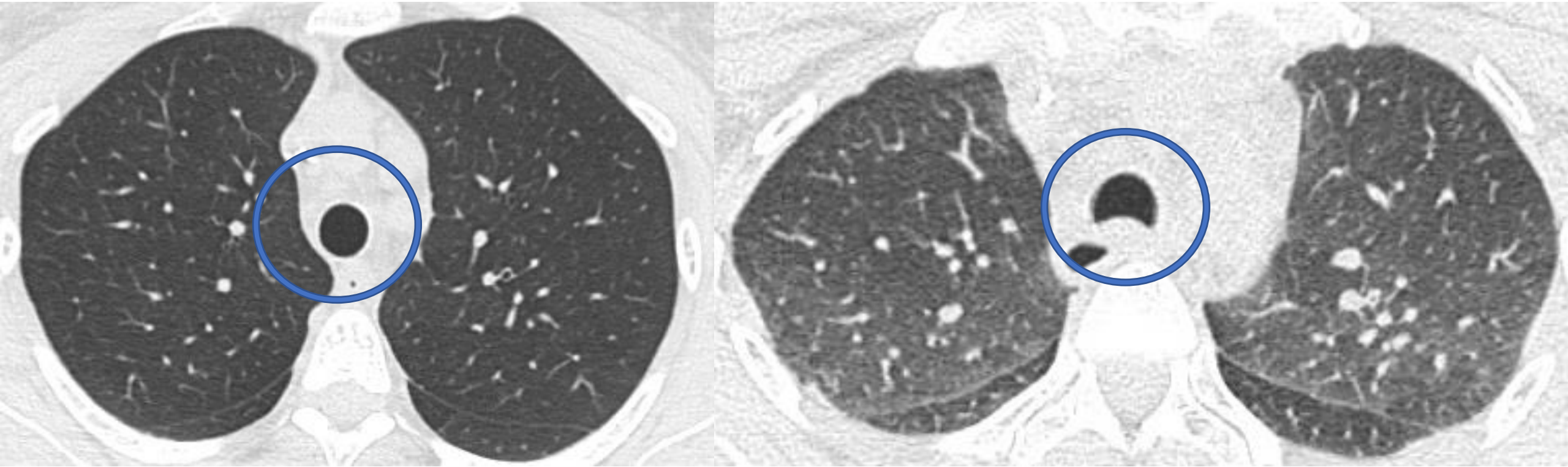



# Pathology or Physiology?





# Pathology VS Physiology : Expiration



 Expiration 80-300 HU increase

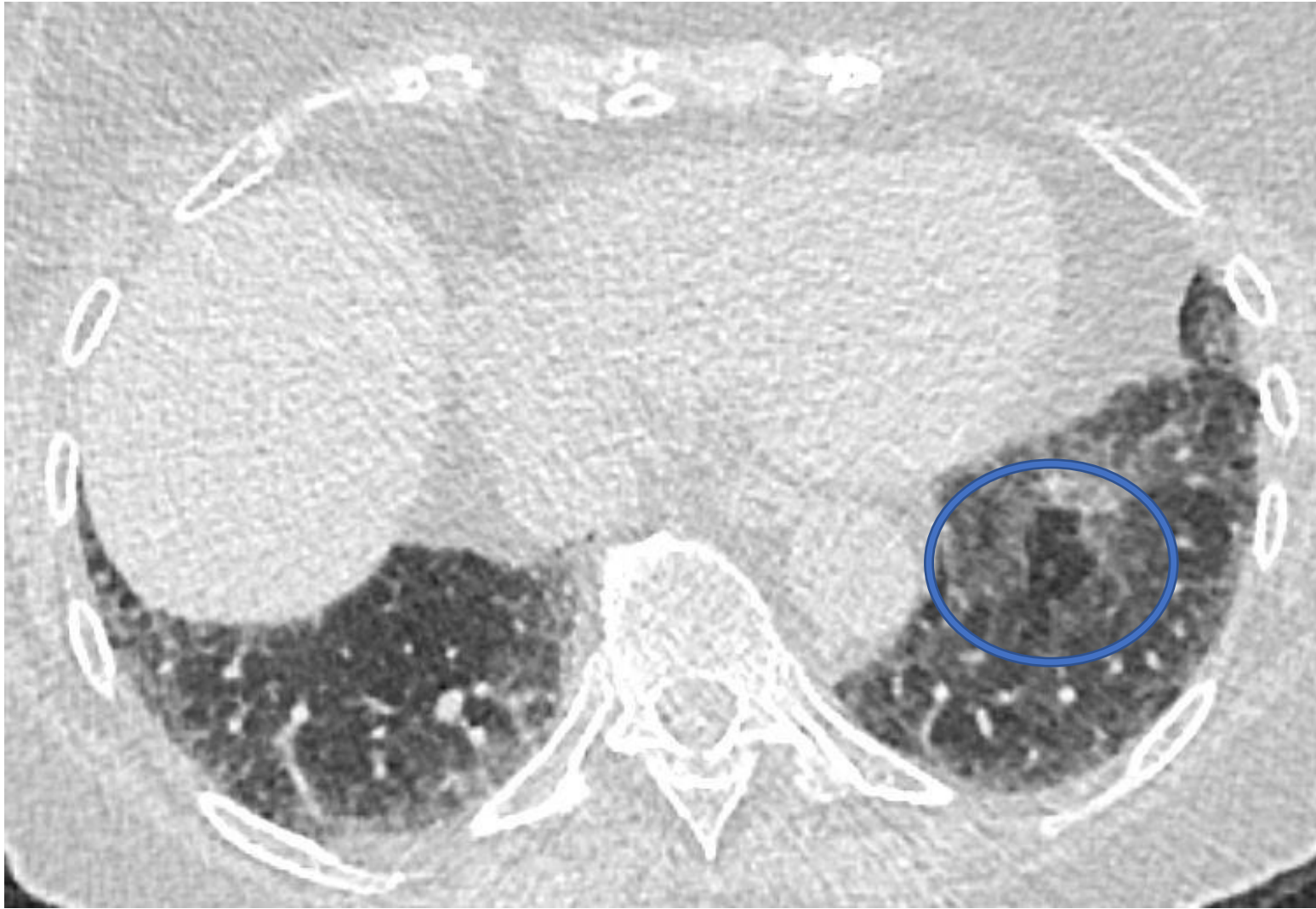
*Robinson and Kreel, JCAT 1979;3(6):740-748*

# Pathology VS Physiology



Expiration mimics Acute exacerbation UIP

# Pathology VS Physiology: Air trapping



Normal:  $-856\text{HU} < 5-25\%$  lung,  $< 5$  lobules

*Tanaka et al, Rad 2003; 227 (3): 776-785*



# Signs of Fibrosis

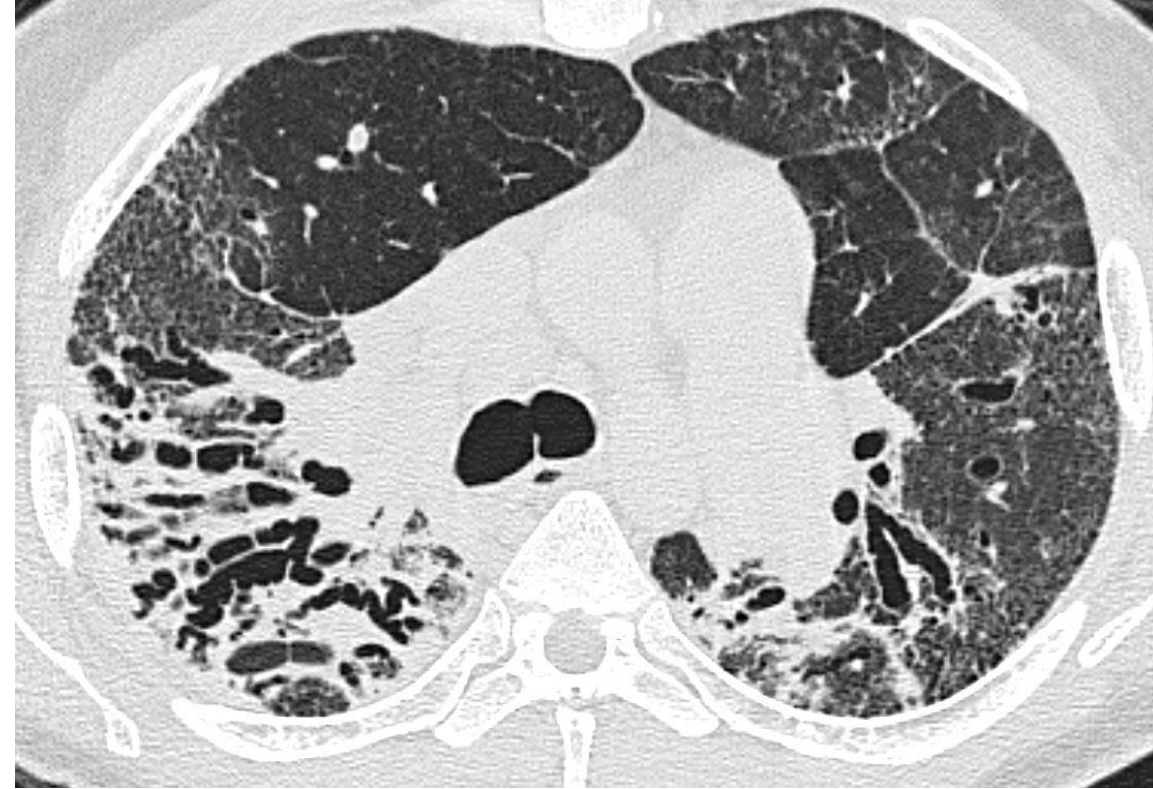
Architectural Distortion

Volume Loss

Reticulation

Traction Bronchiectasis

Honeycombing



# Signs of Fibrosis

Architectural Distortion

Volume Loss

Reticulation

Traction Bronchiectasis

Honeycombing

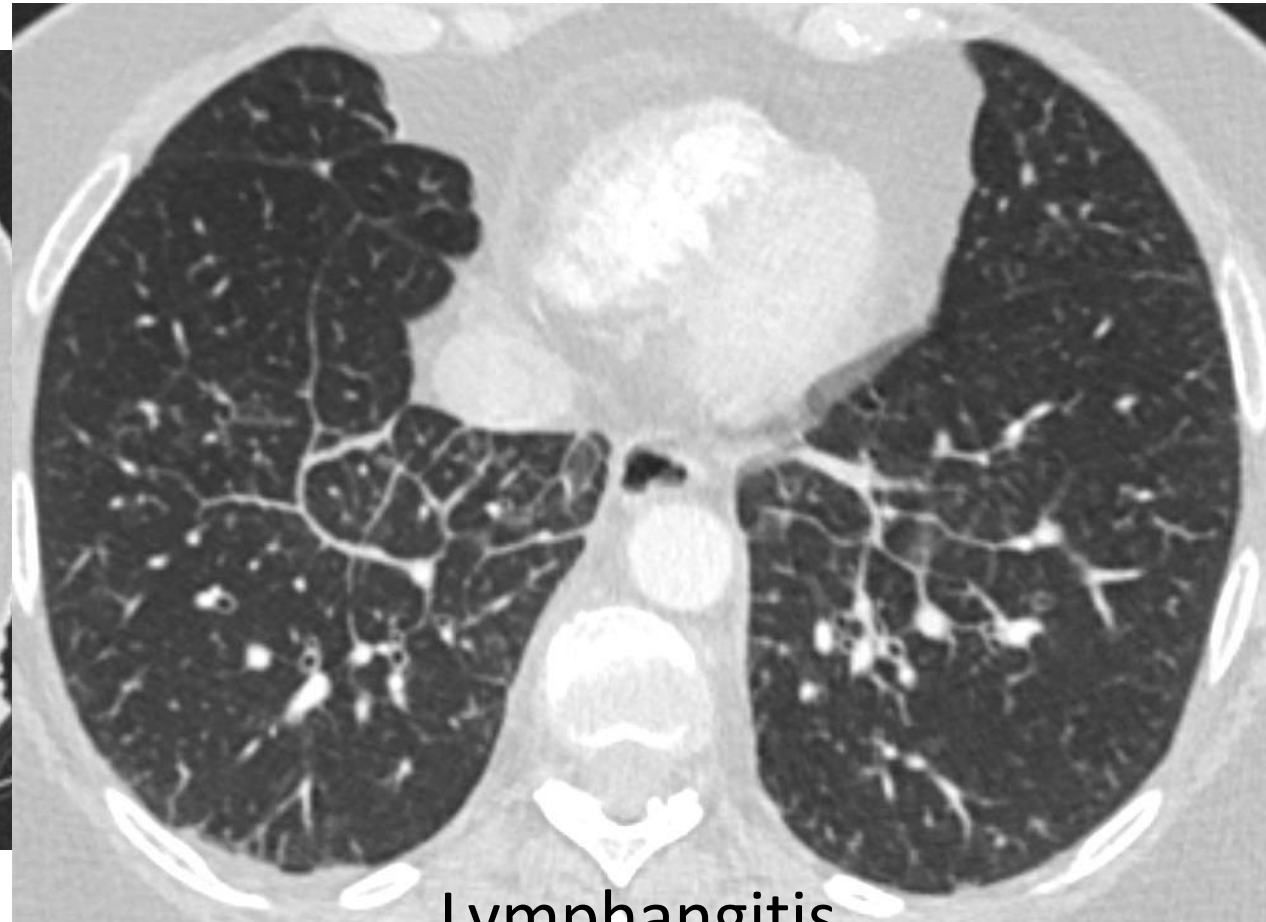


**IRREVERSIBLE**

# Mimics of fibrotic reticulation



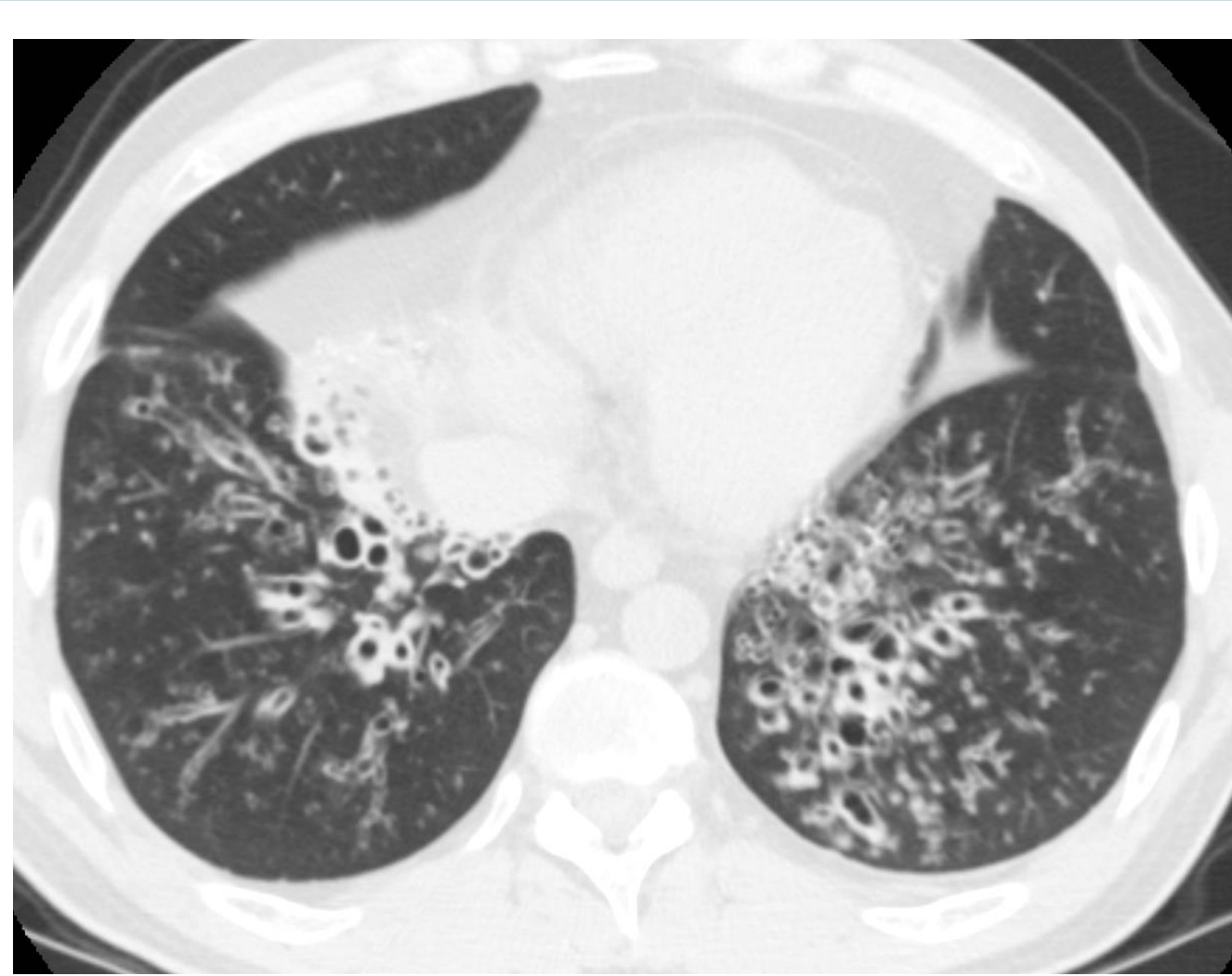
Amyloid



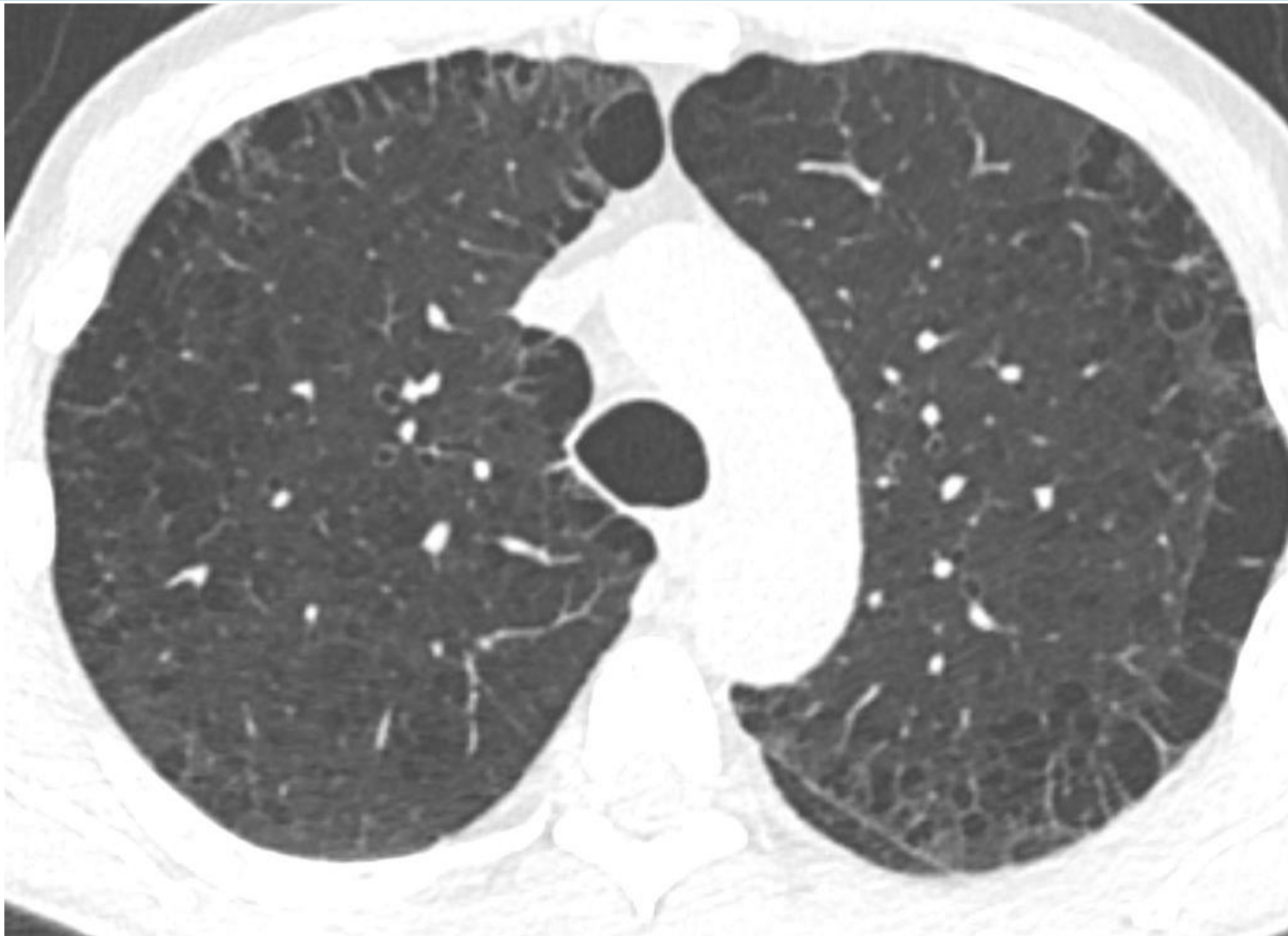
Lymphangitis  
Carcinomatosis



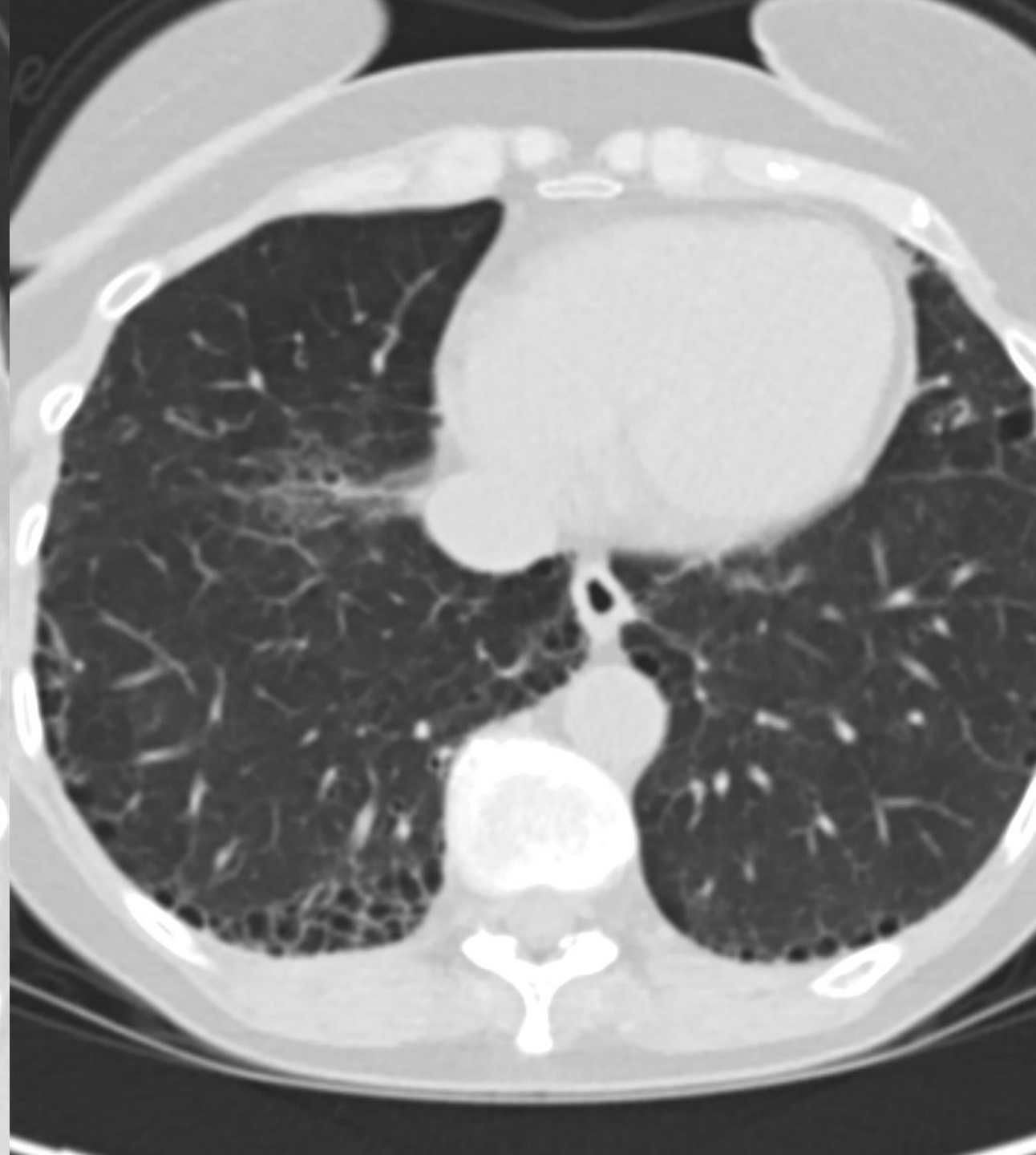
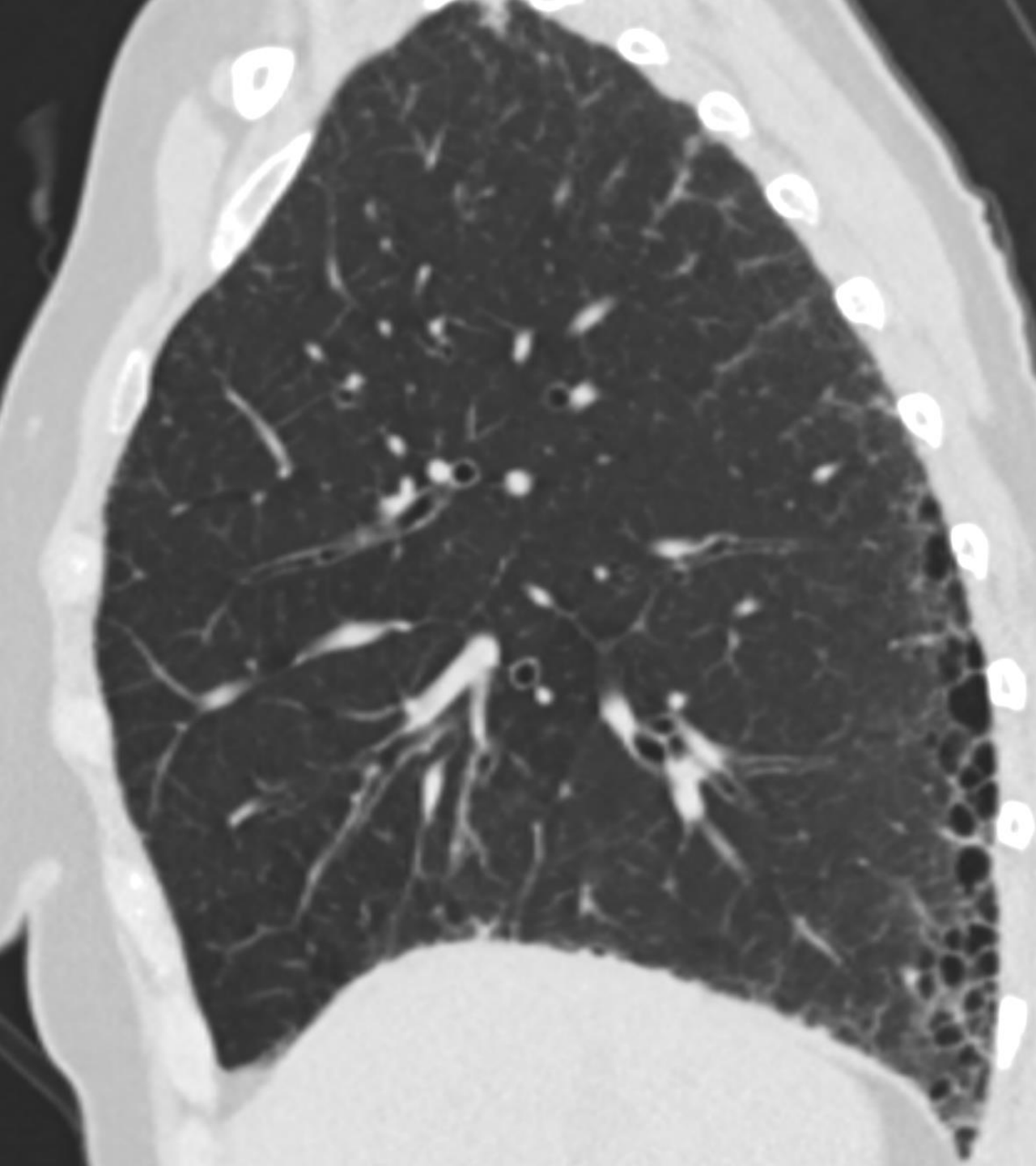
# Mimics of Traction Bronchiectasis



# Mimics of Honeycombing

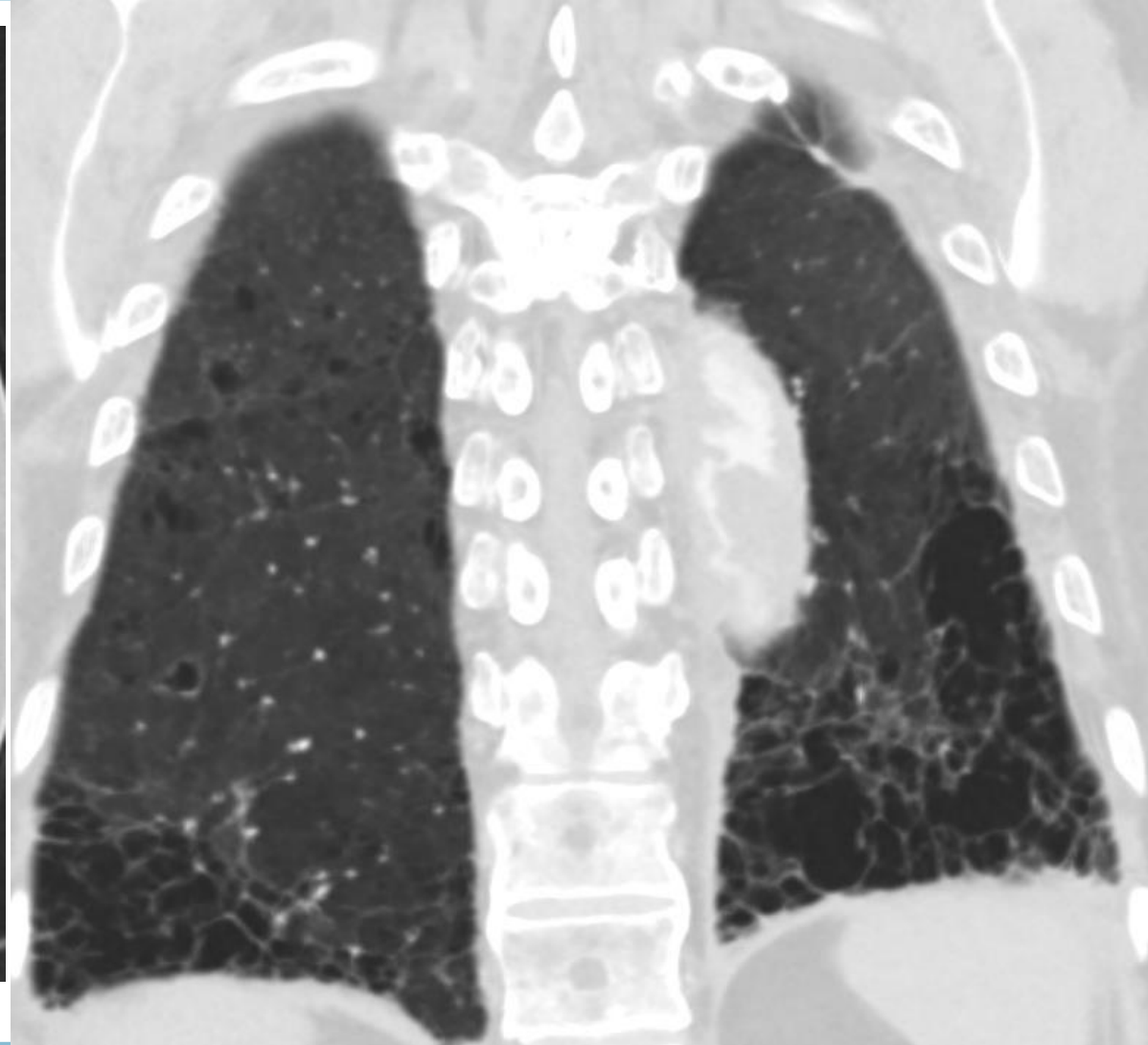


Paraseptal Emphysema

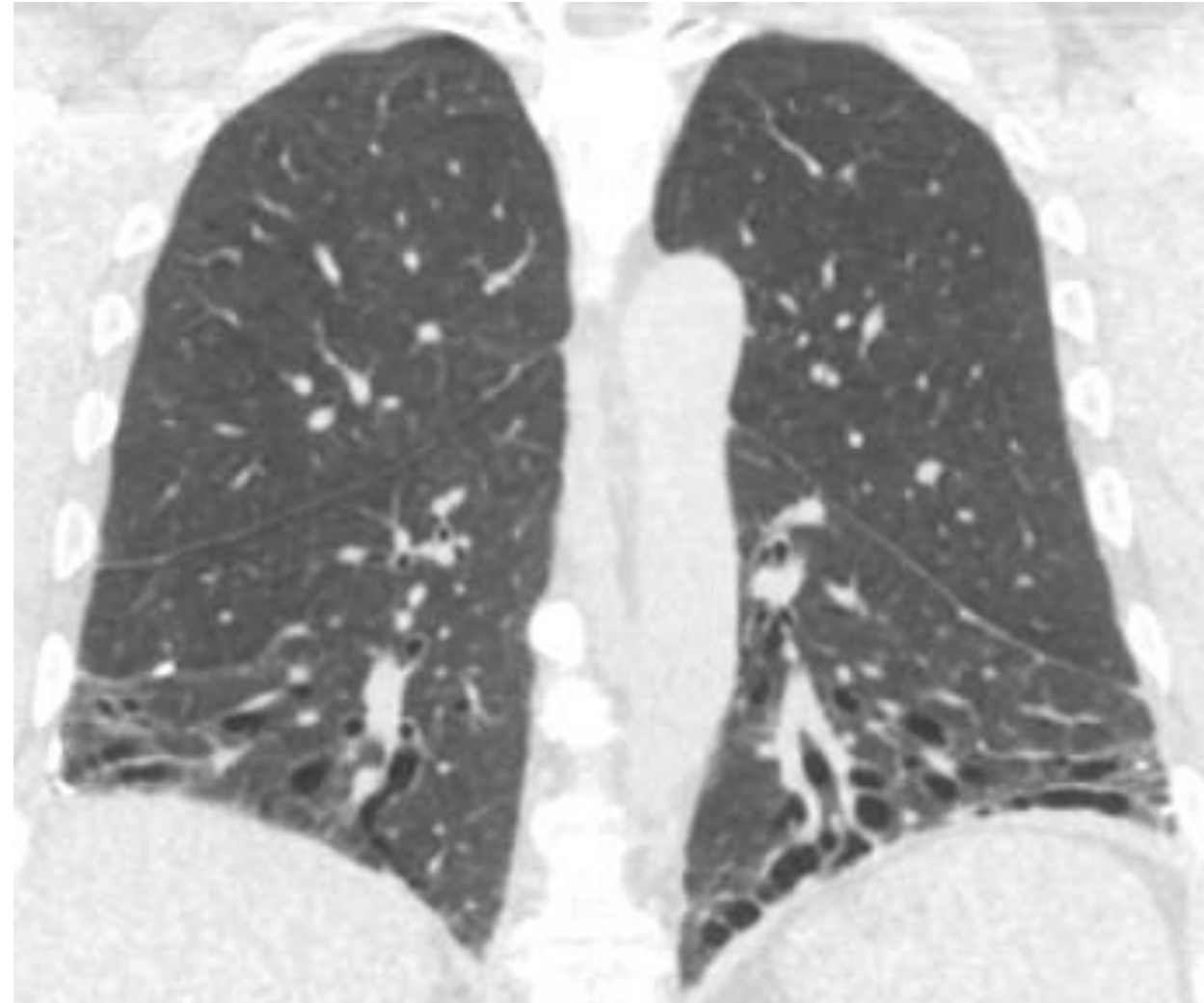
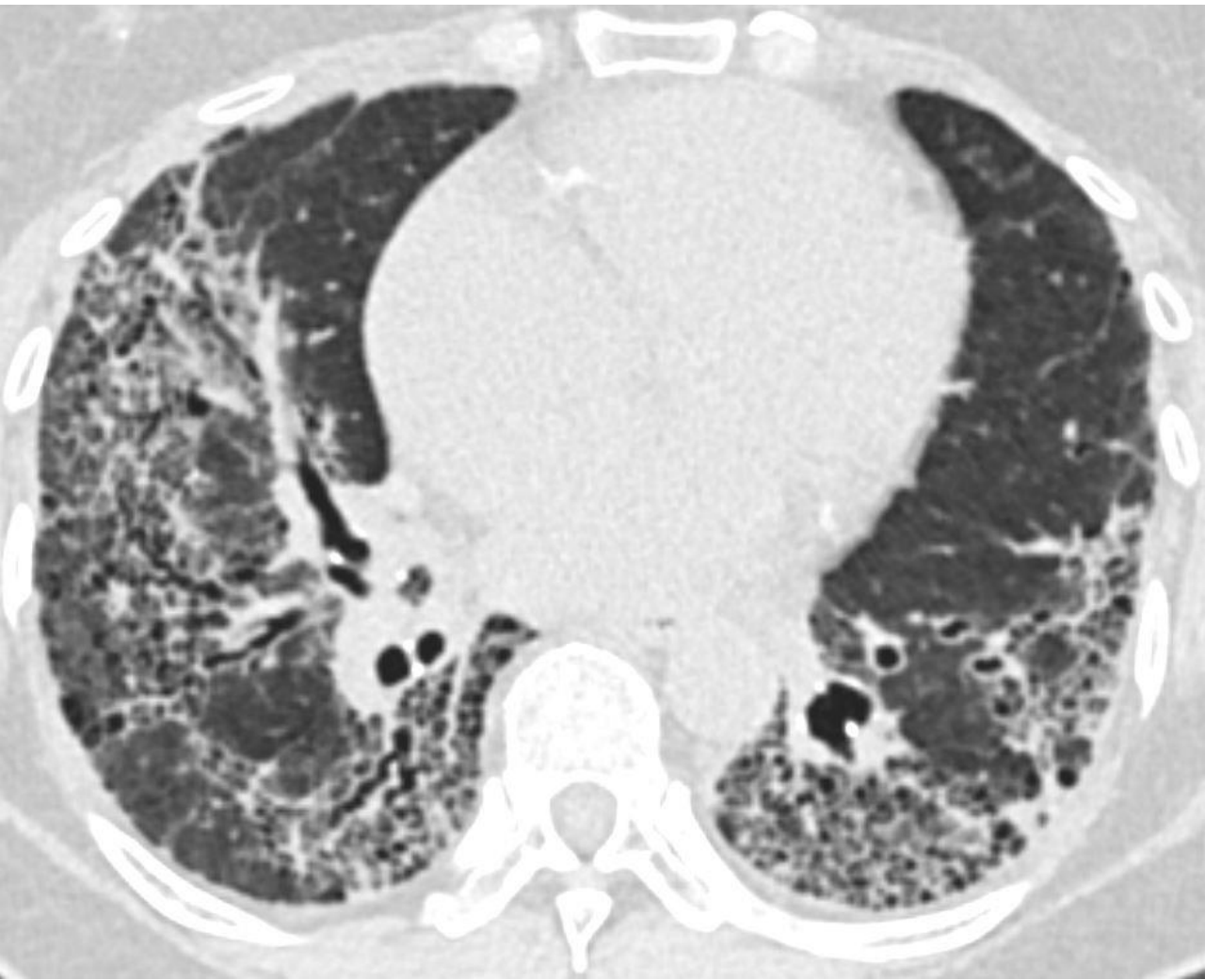




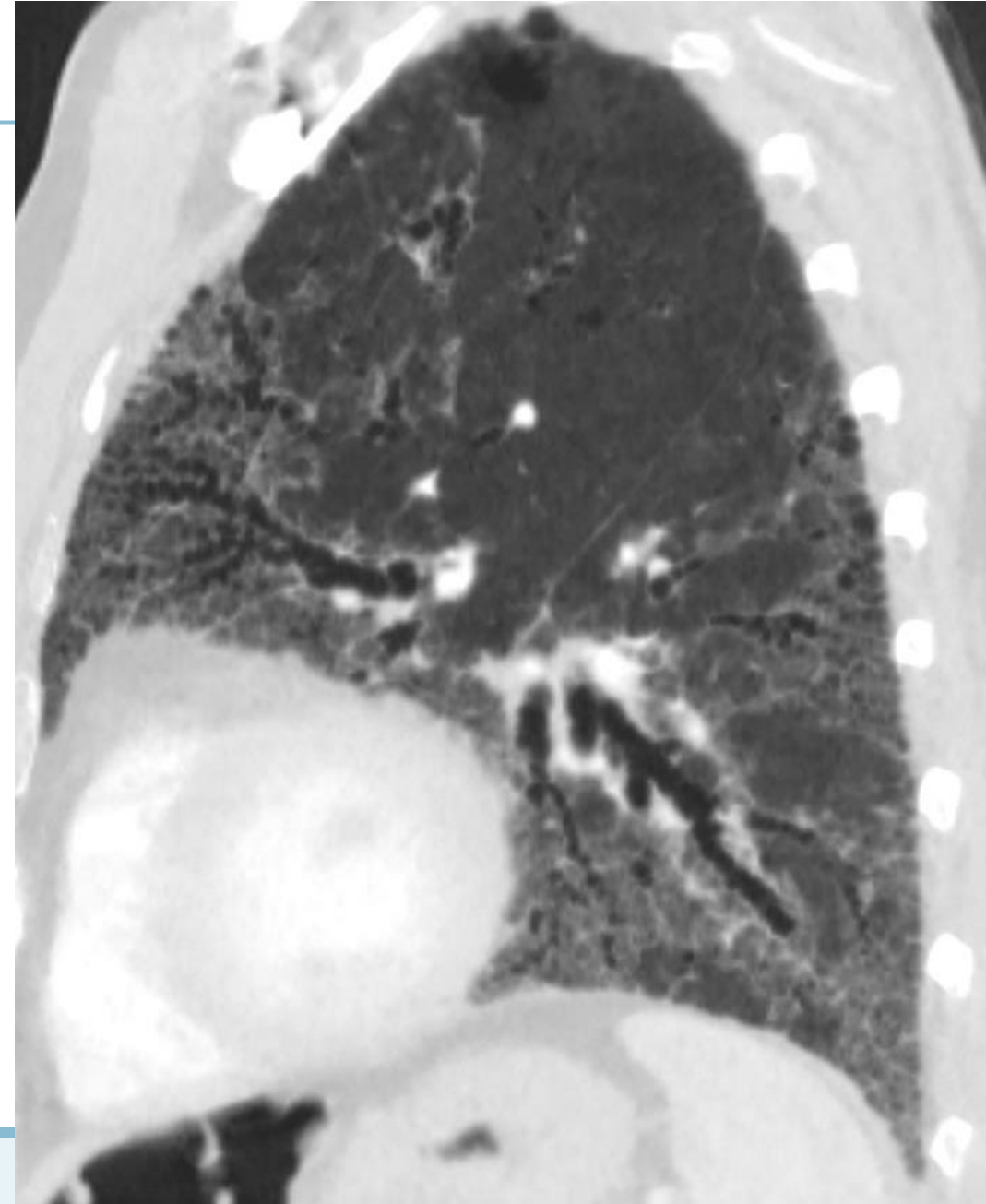
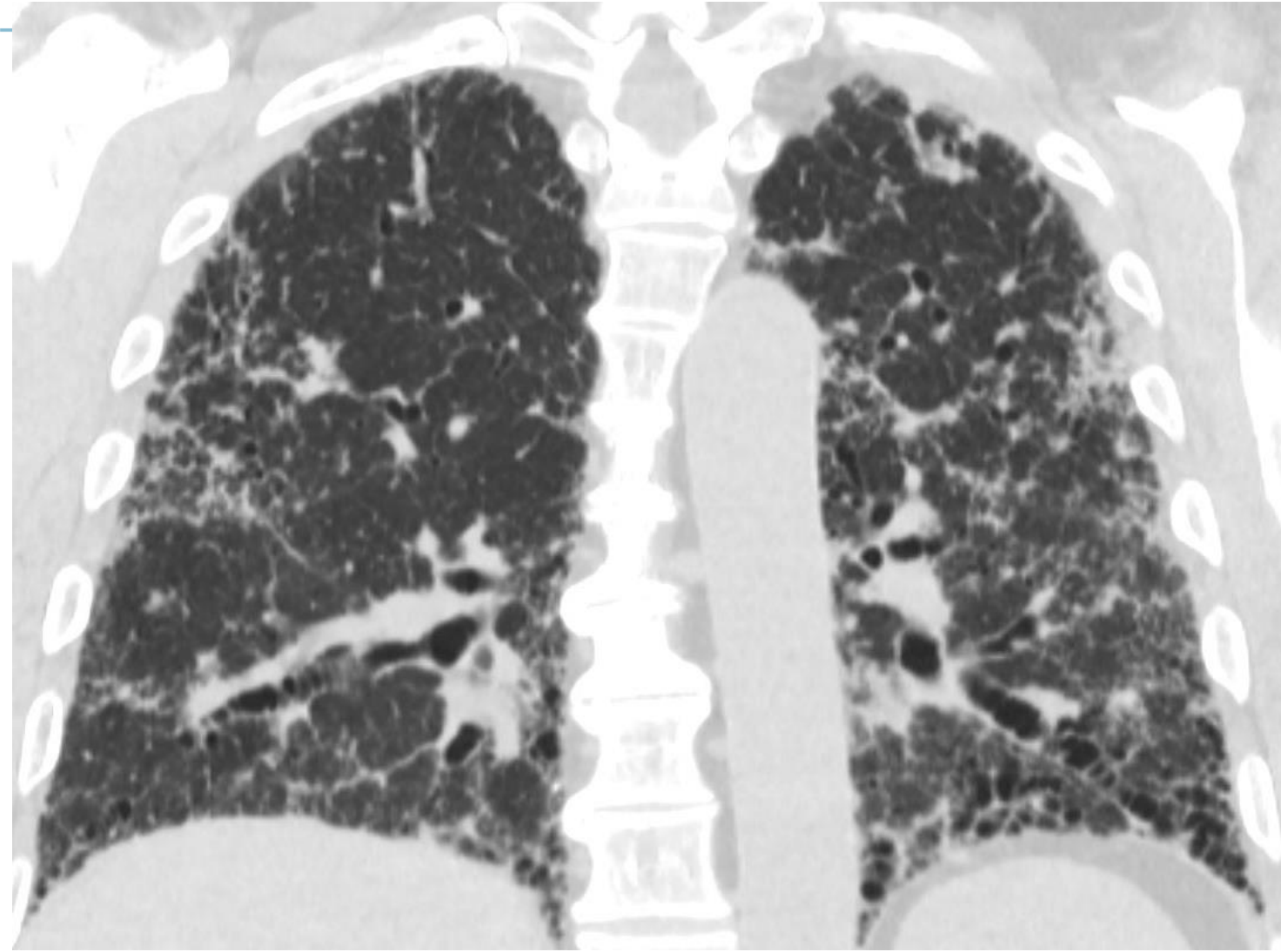
# Mimic of Honeycomb cysts : Smoking Related Interstitial Fibrosis (SRIF)



# Is it traction bronchiectasis or honeycombing?



# MPRs help





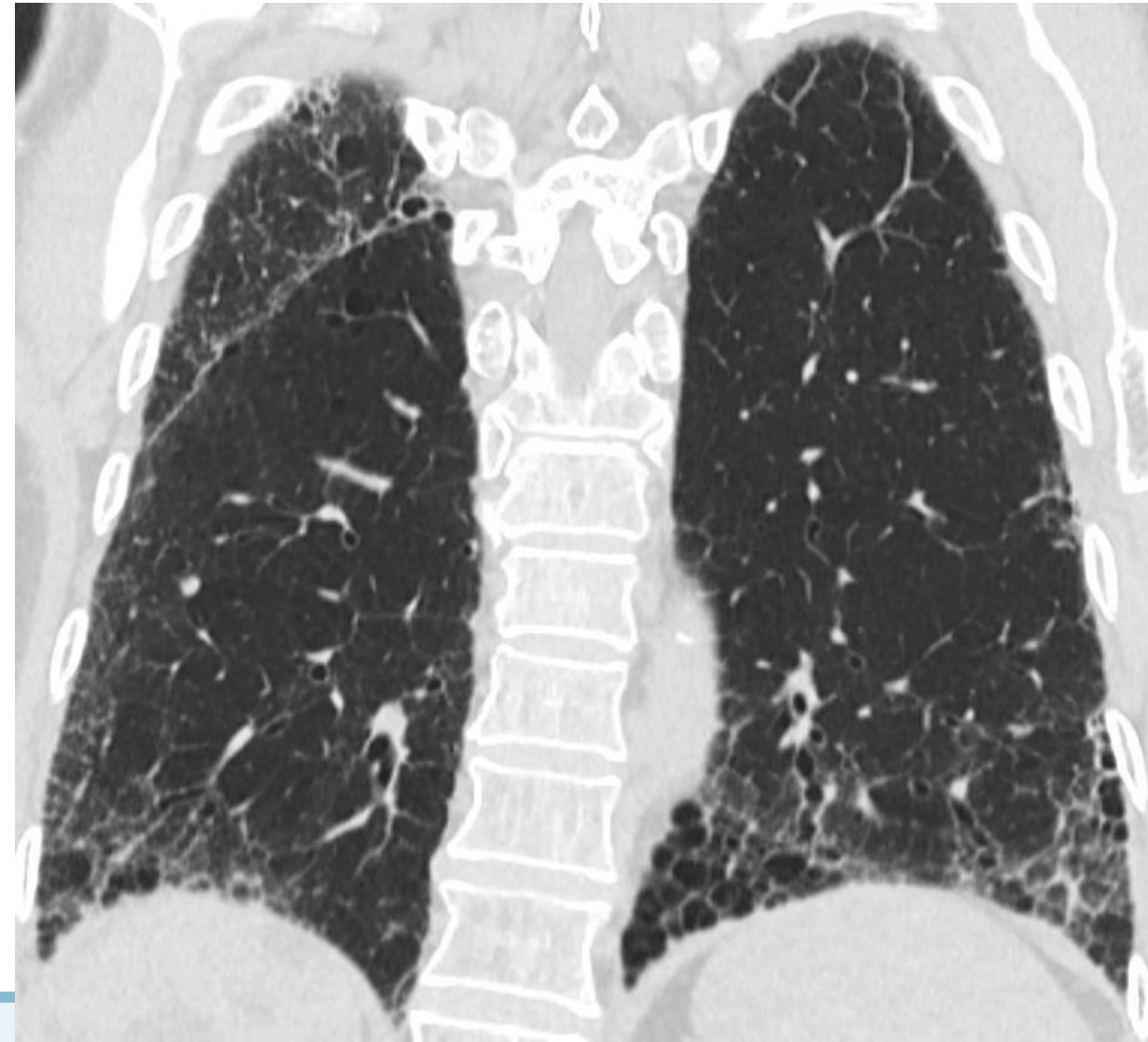
# Combined Pulmonary Fibrosis and Emphysema



# Combined Pulmonary Fibrosis and Emphysema

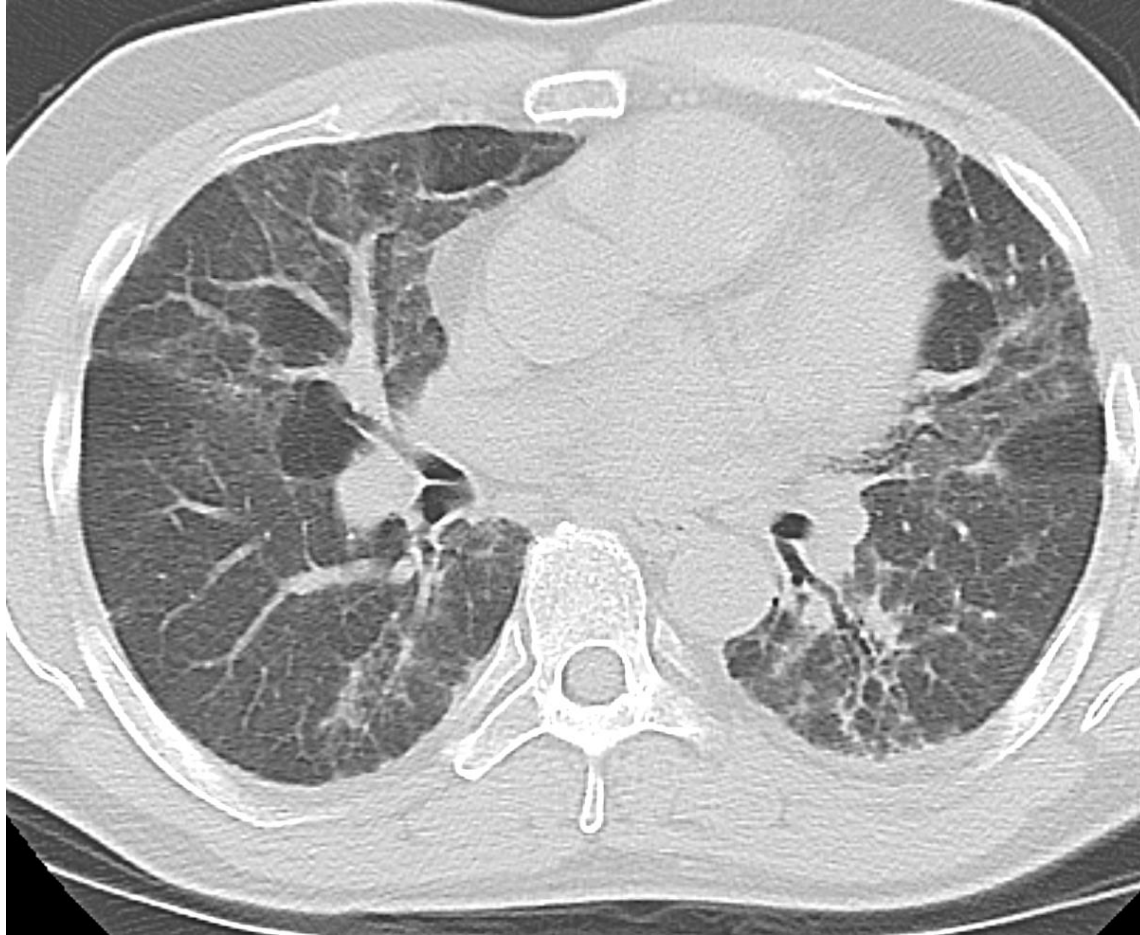


# Combined Pulmonary Fibrosis and Emphysema



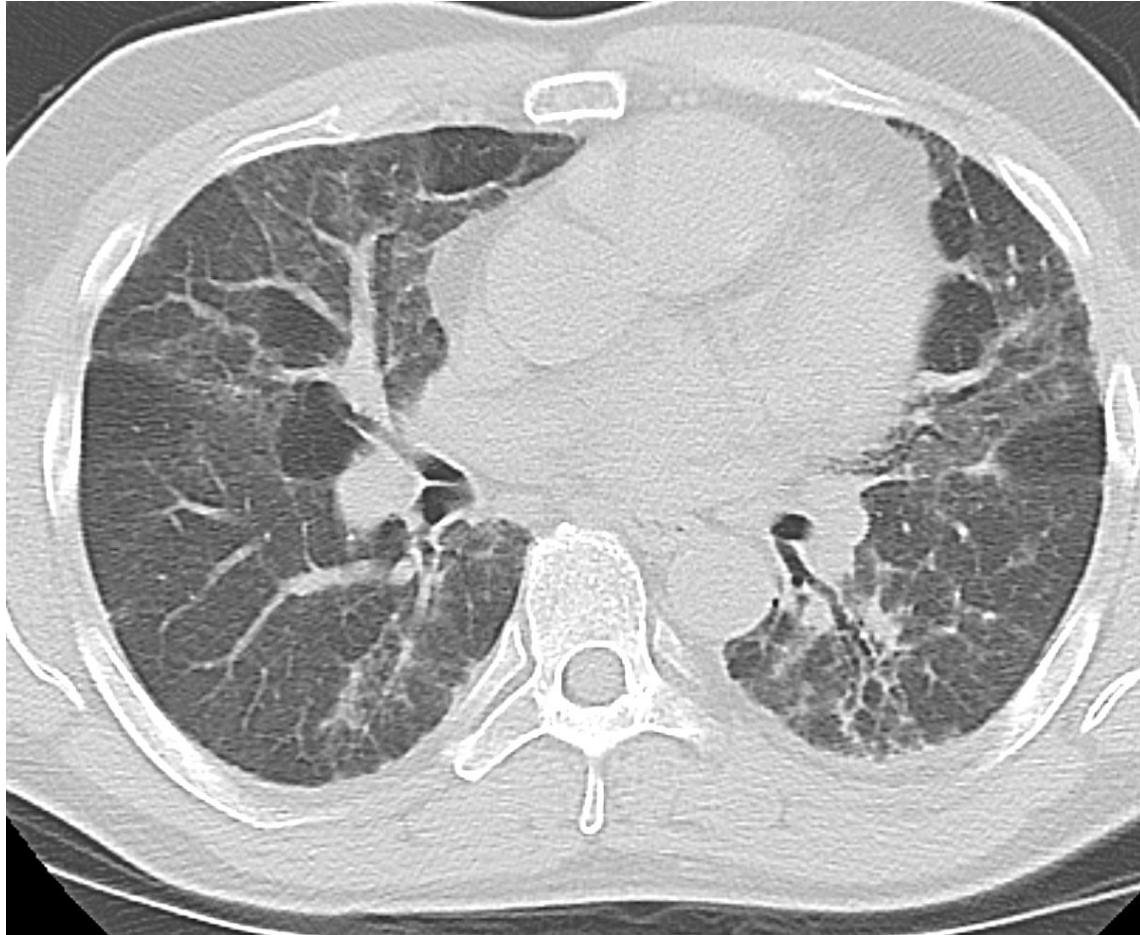


# Air trapping in IPF





# Air trapping in IPF



fHP



UIP and IPF

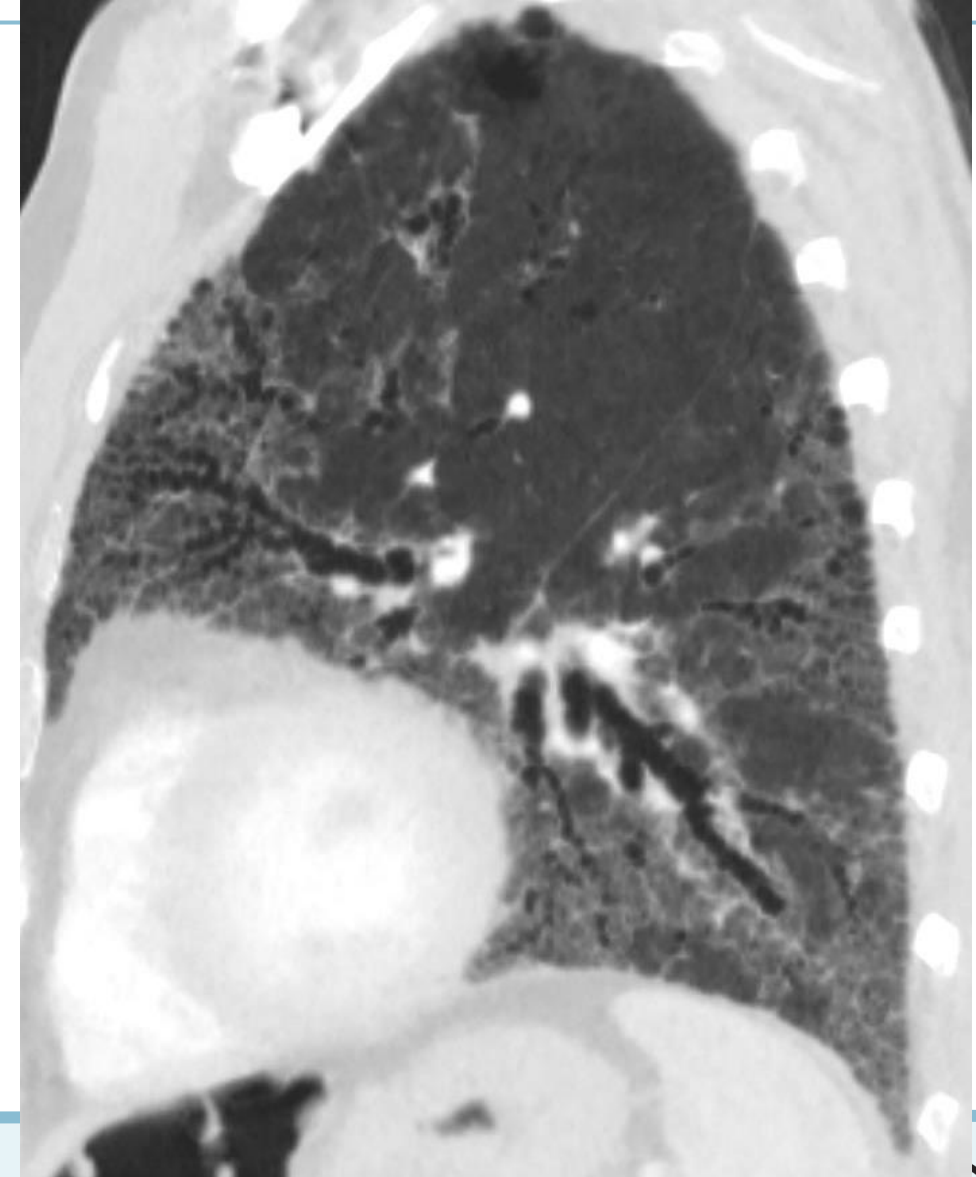
# Summary

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