

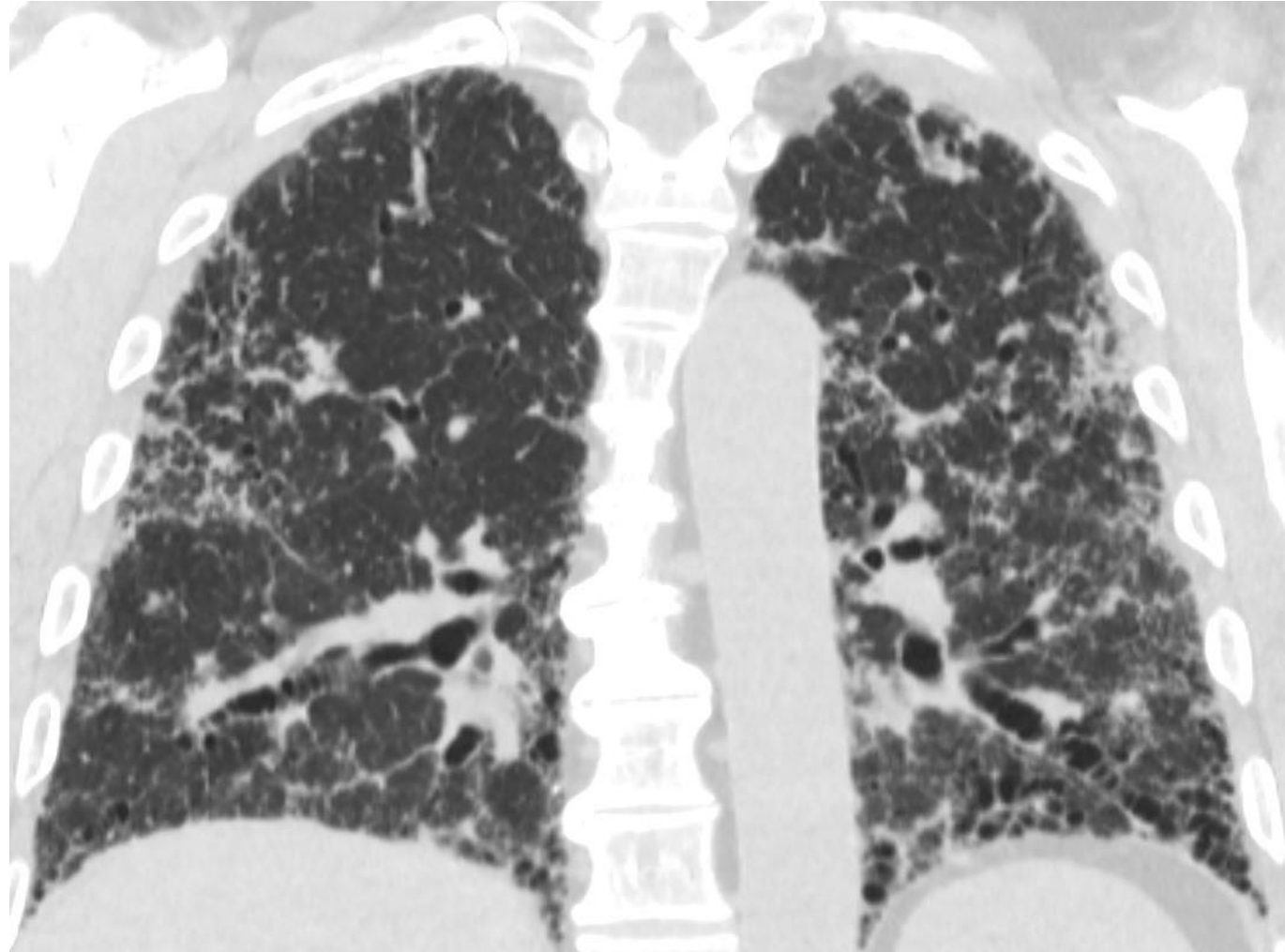
HRCT Patterns and Pitfalls:

Approach to Fibrotic Lung Disease

Amita Sharma

Thoracic Imaging and Intervention

Massachusetts General Hospital



Objectives

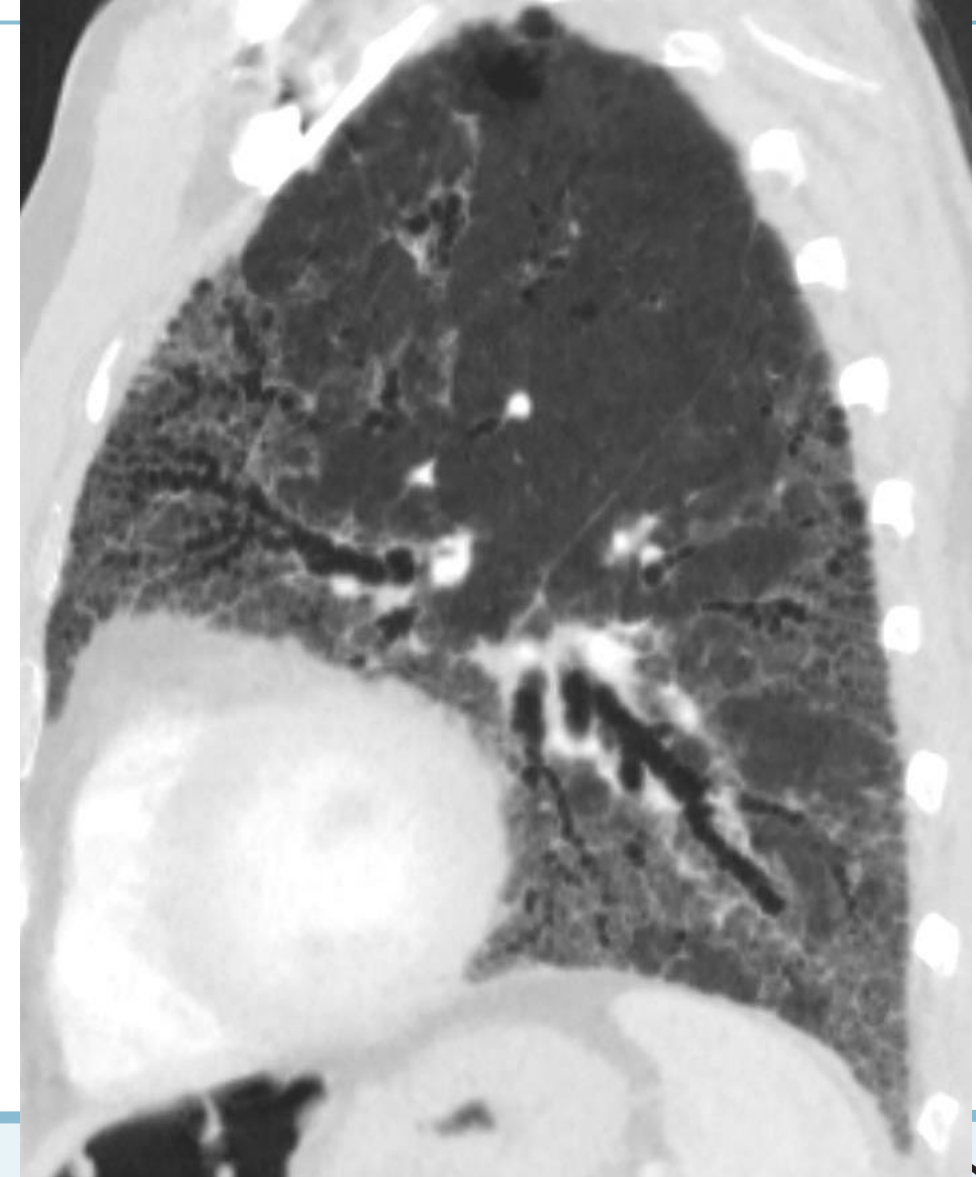
Discuss Pitfalls in CT diagnosis of
Fibrotic ILD

Technical Factors

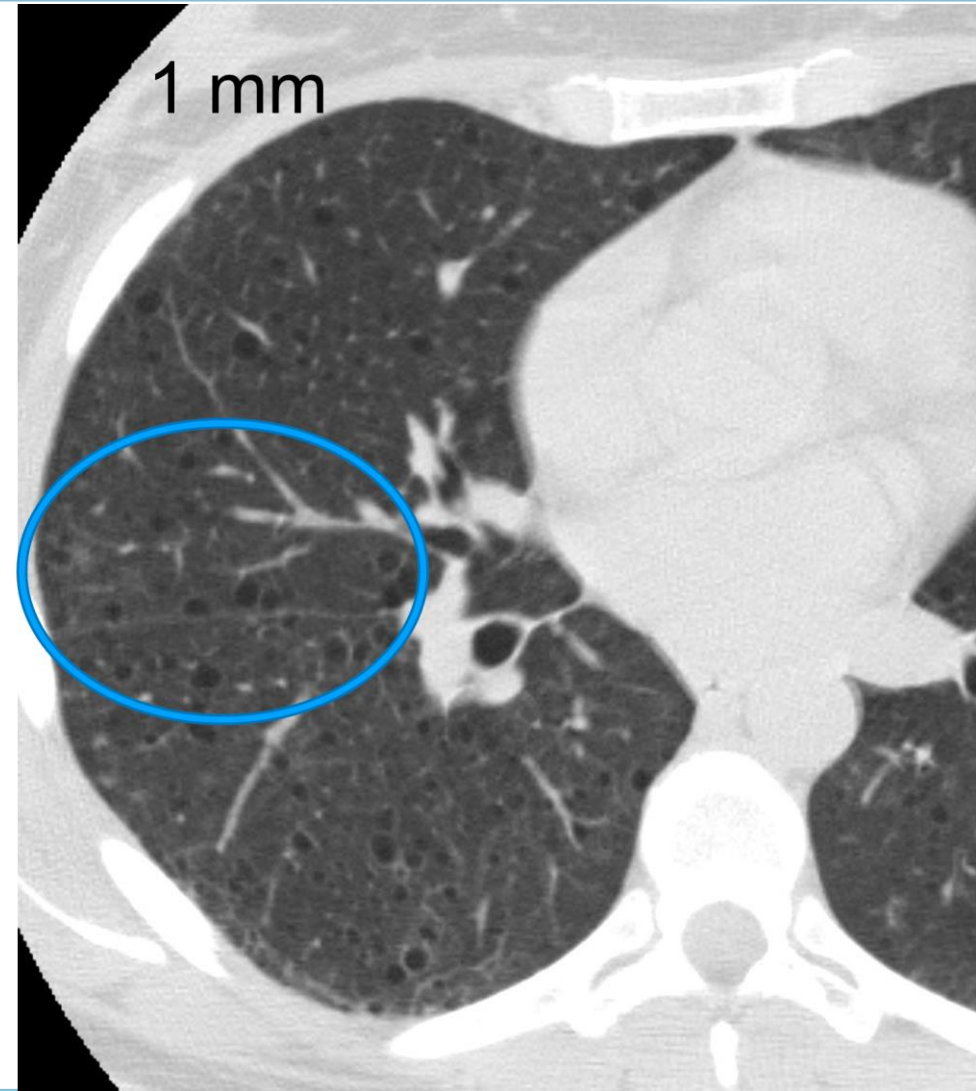
Physiology VS Pathology

CT Signs of Fibrosis

Pitfalls of Radiologic Signs



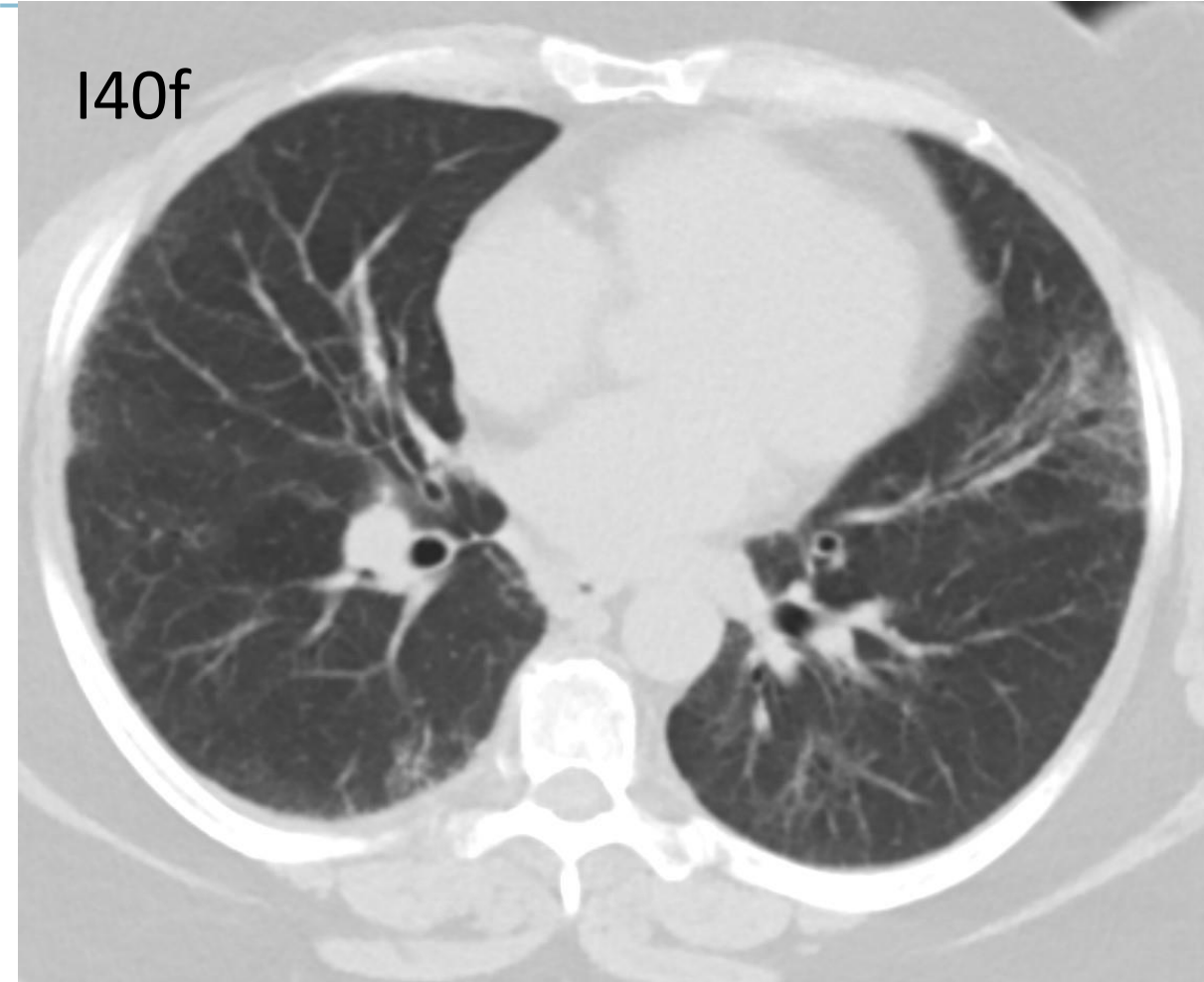
Technical Factors: Slice Thickness



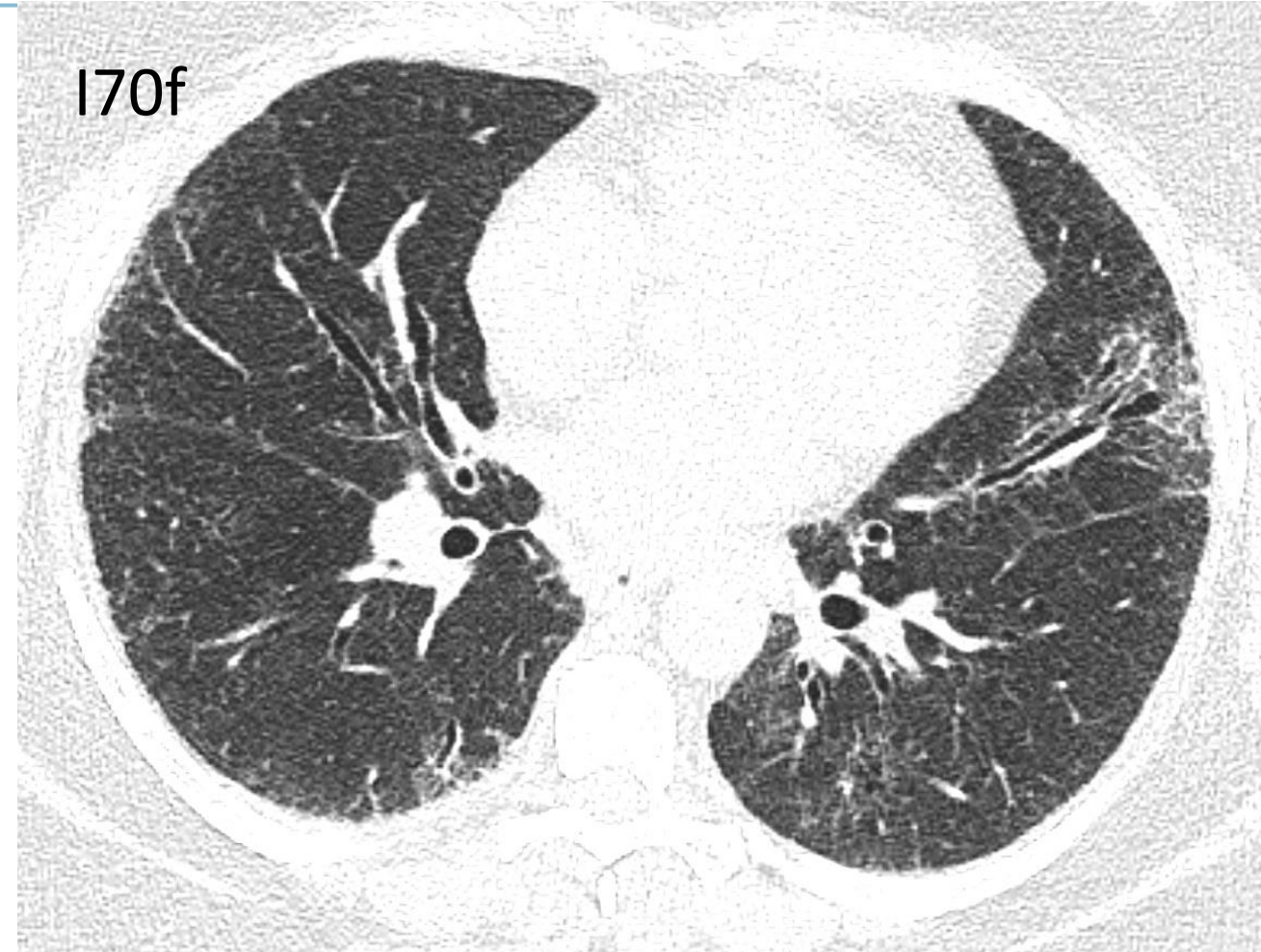
Thin slice reduces partial volume averaging

Technical Factors: Reconstruction Kernel

140f




170f



 Soft VS sharp kernel: spatial resolution

Technical Factors: Reconstruction Kernel



 Extra sharp can increase noise and artefacts

Technical Factors: Low Dose

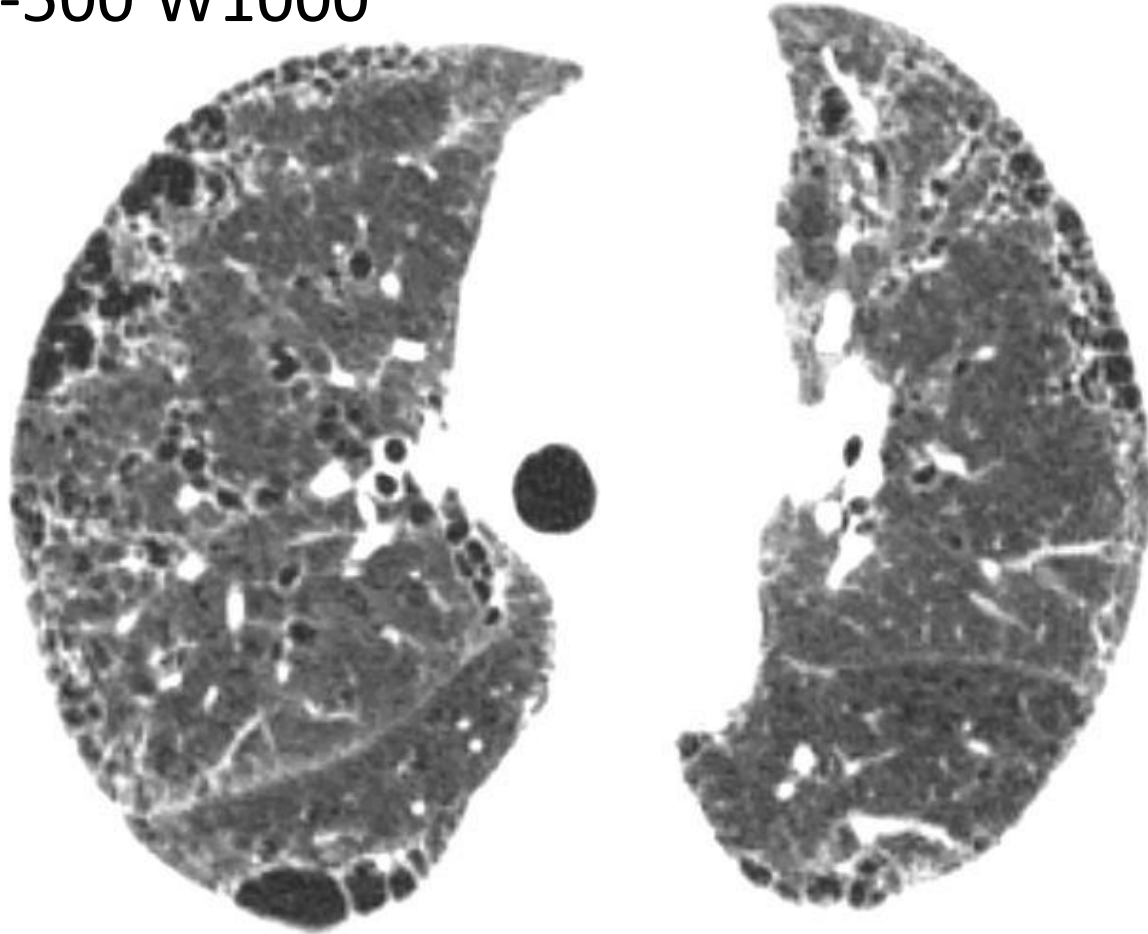
CTDIvol 1.5mGy



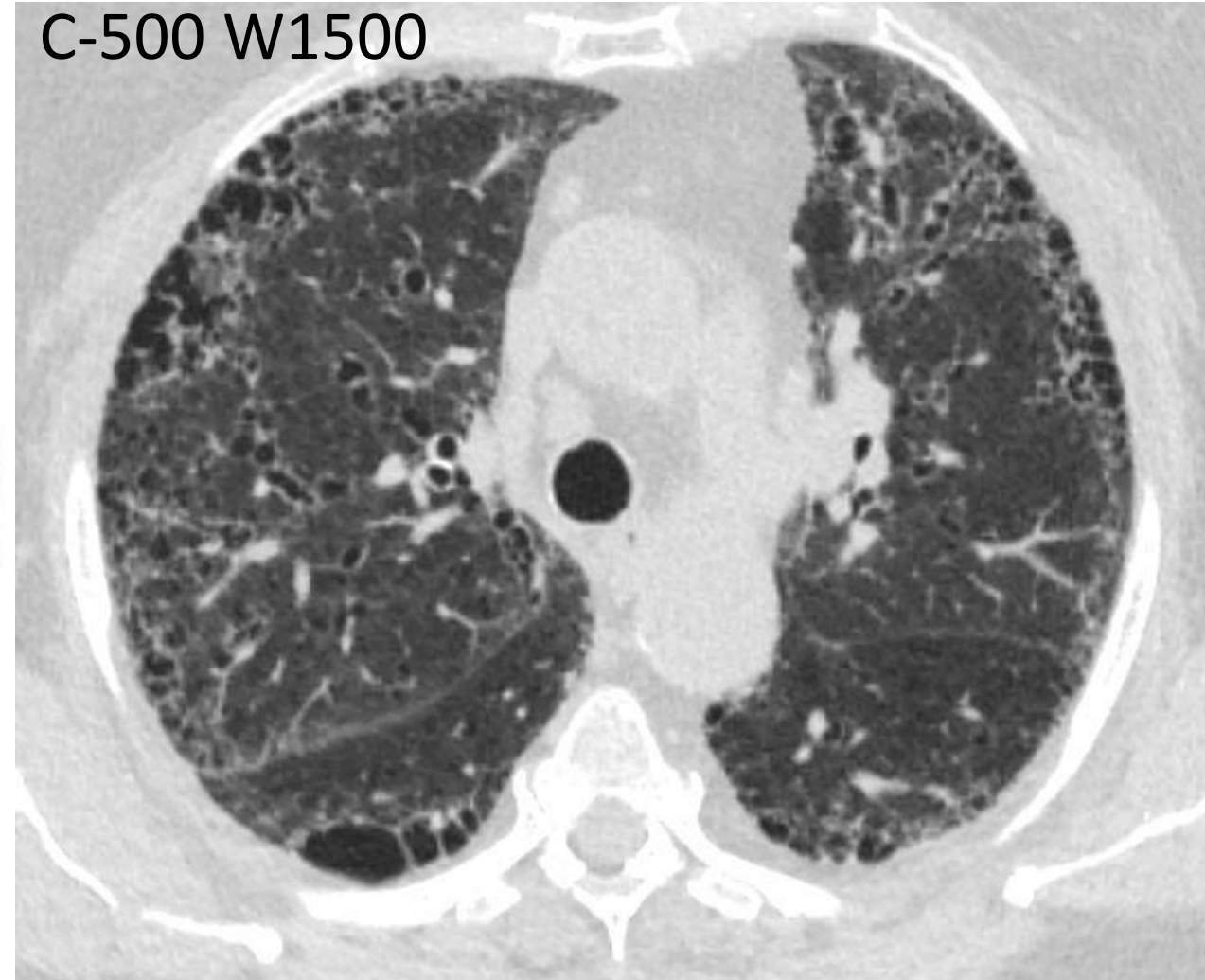
 Lung inherent contrast enables low dose imaging

Technical Factors: Window Level

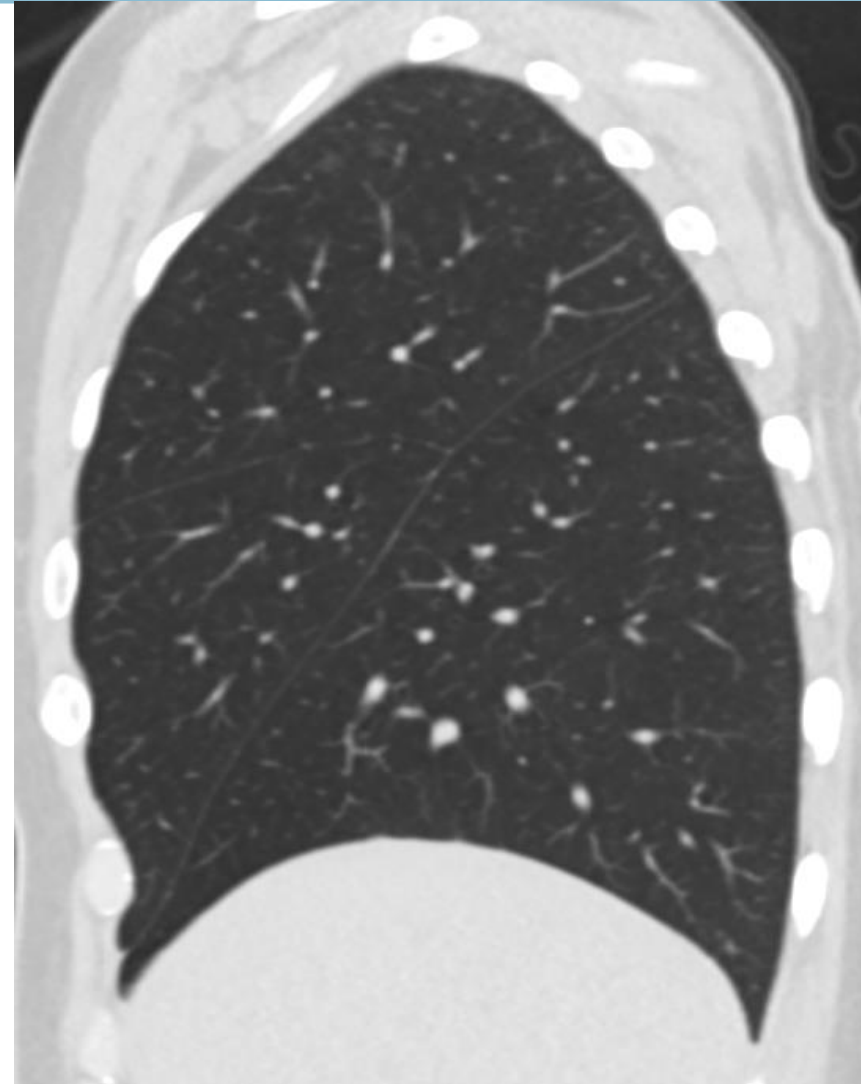
C-500 W1000



C-500 W1500



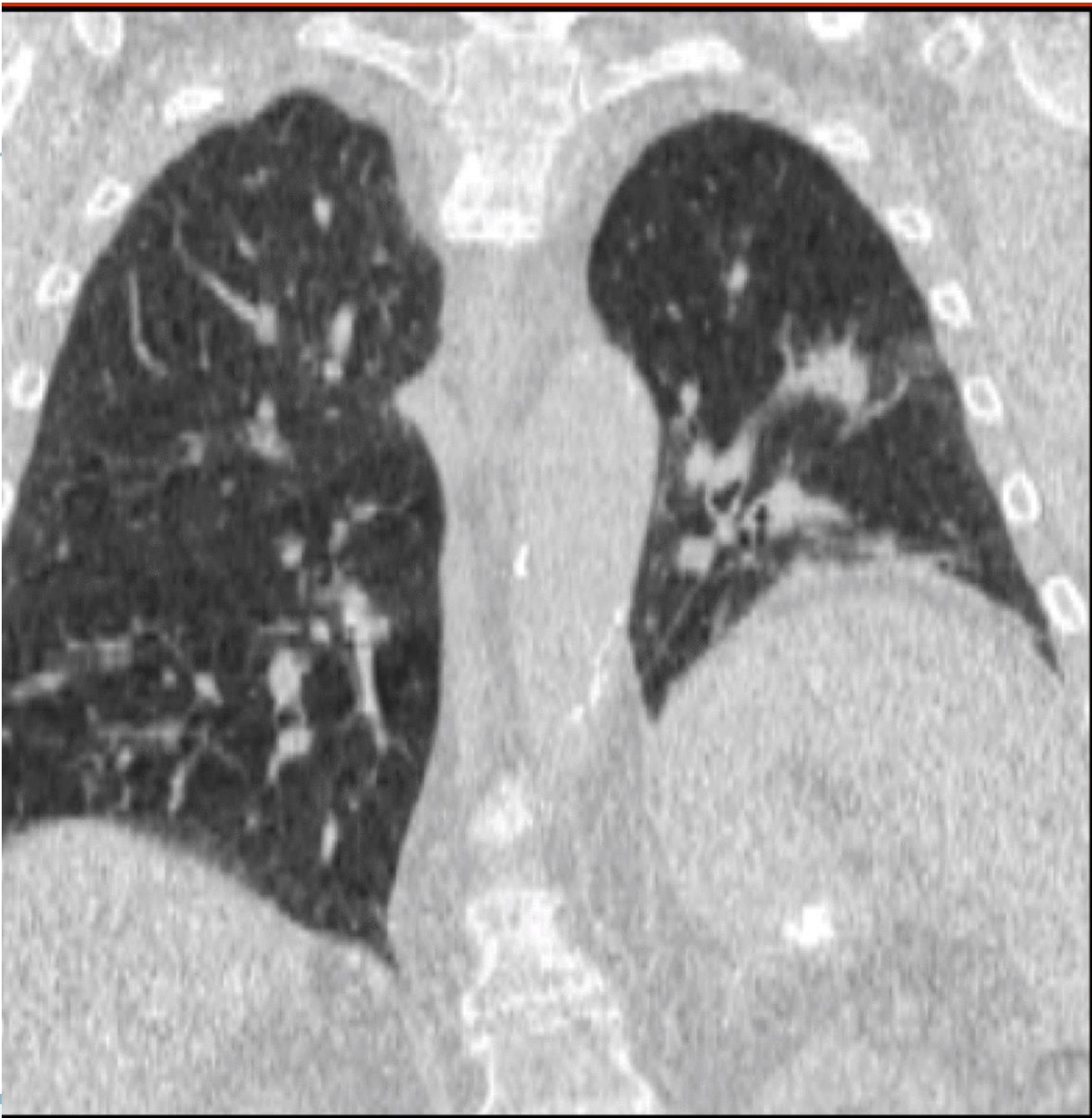
Pathology VS Physiology



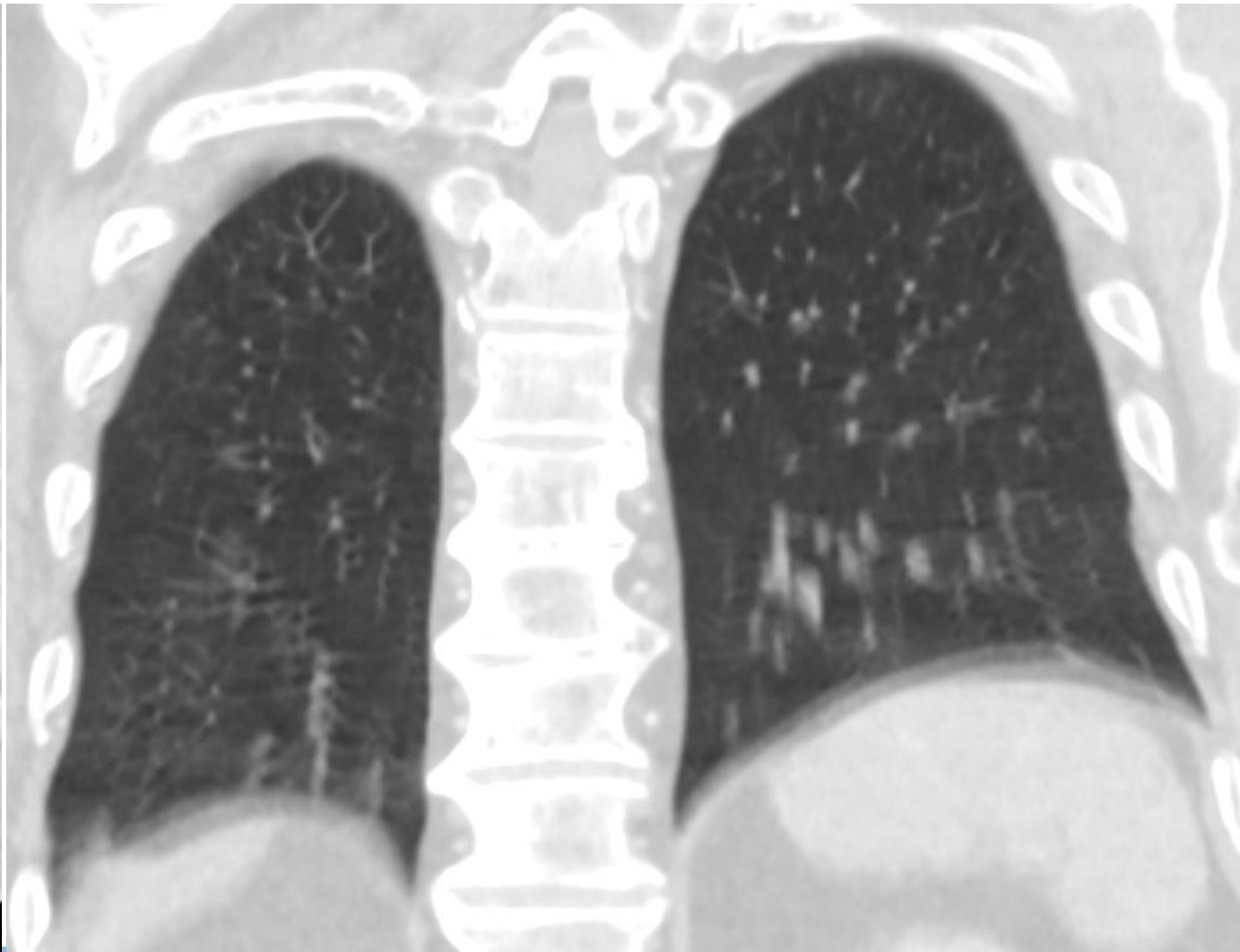
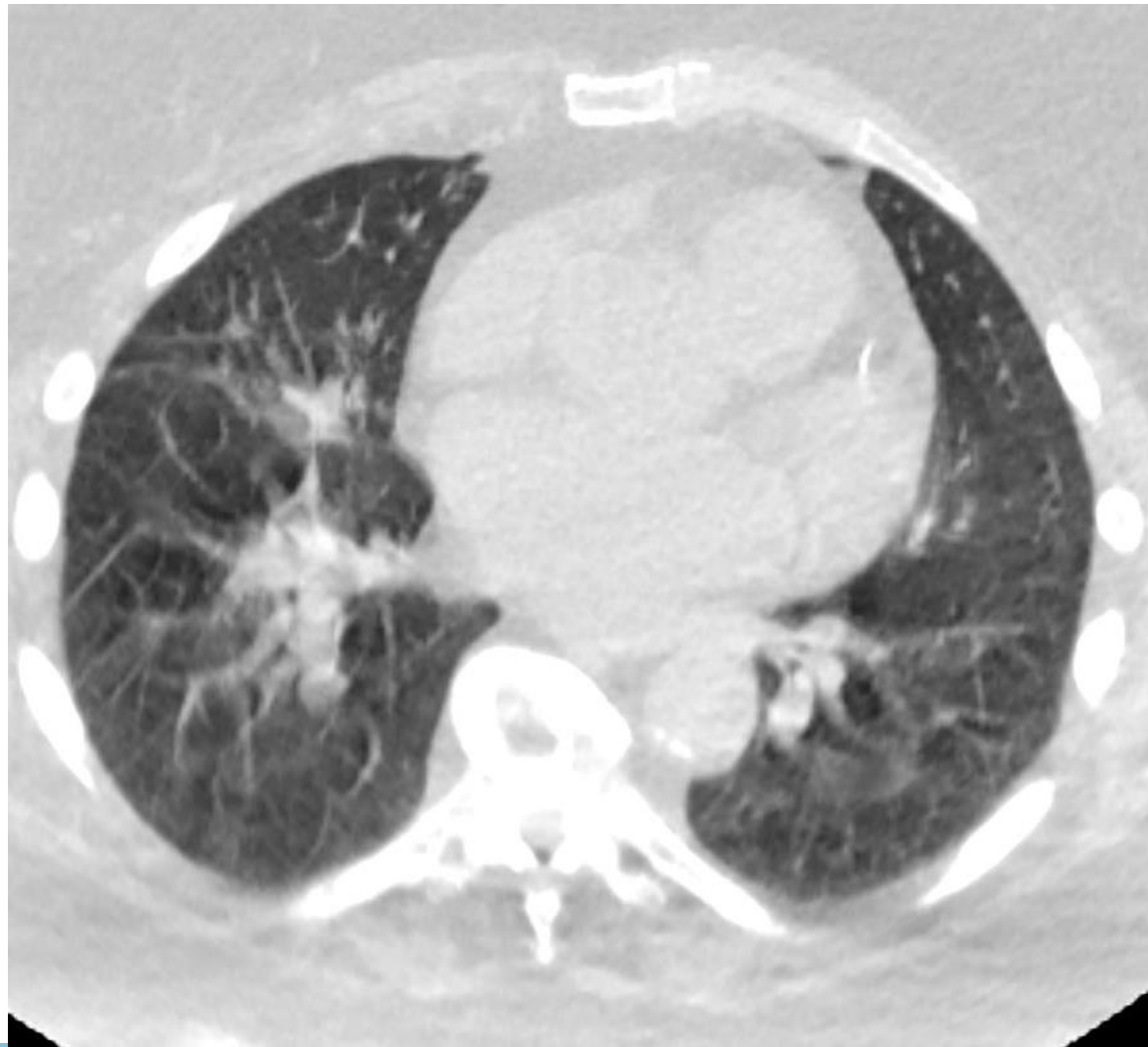
 Motion

Dependent Density

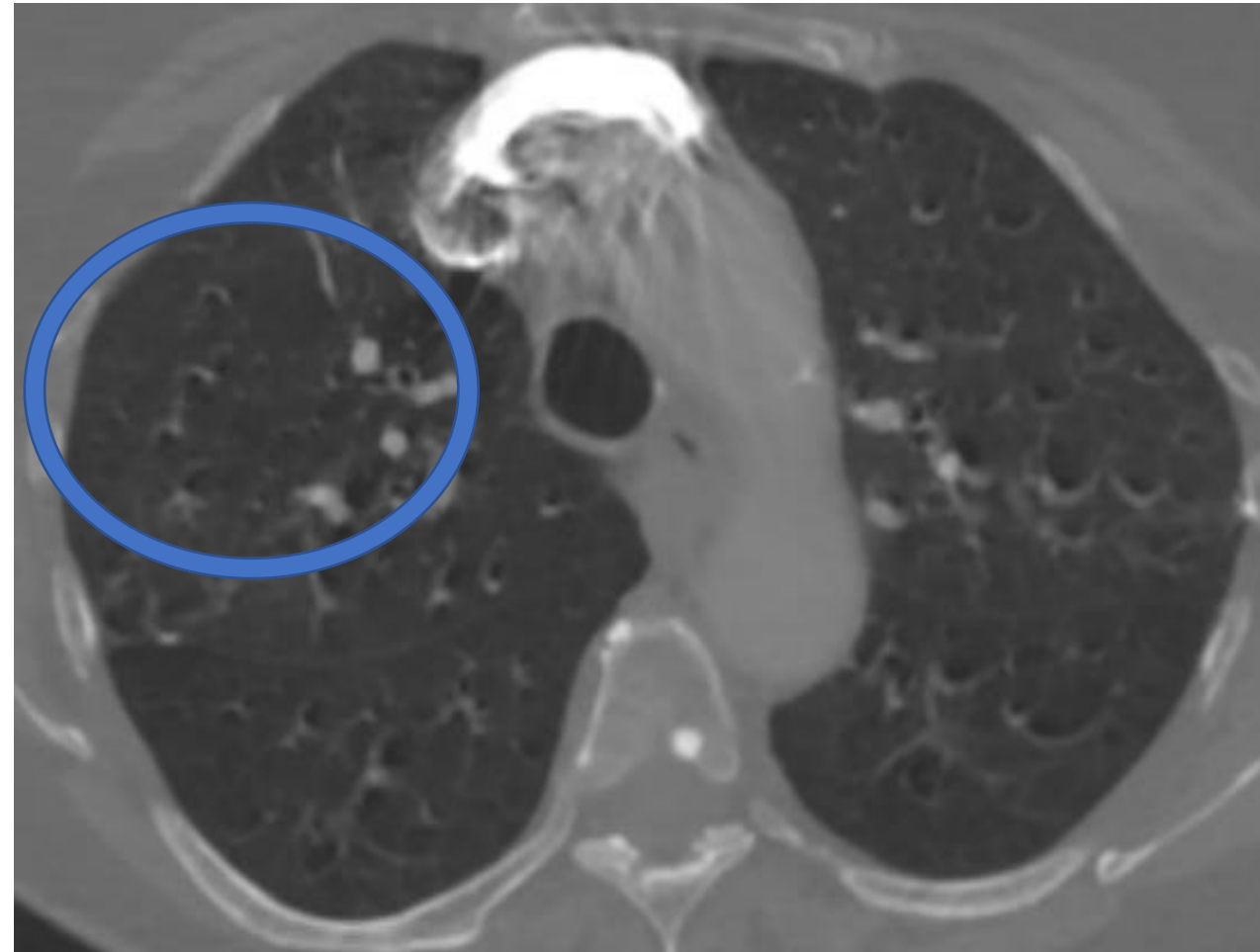
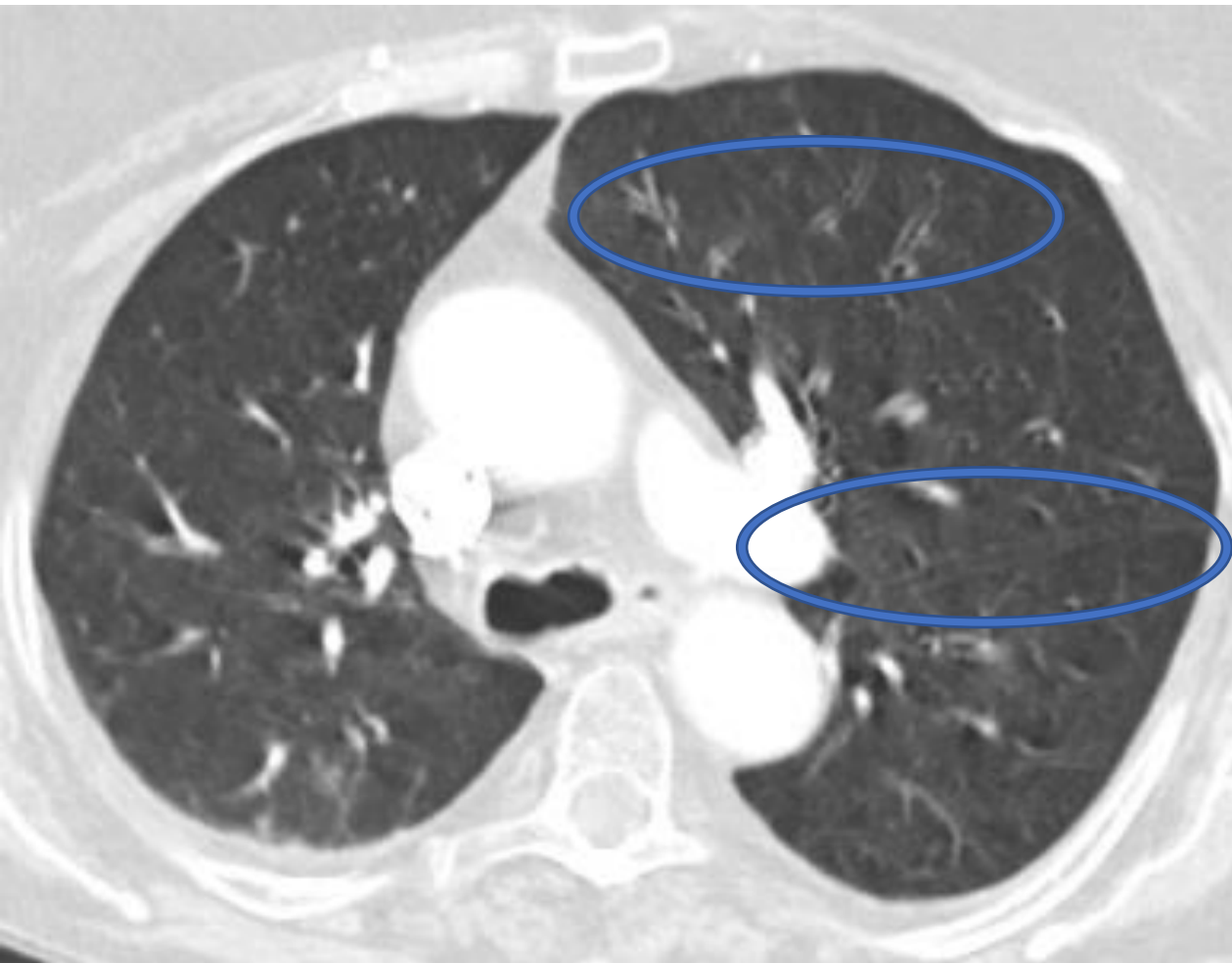
Expiration



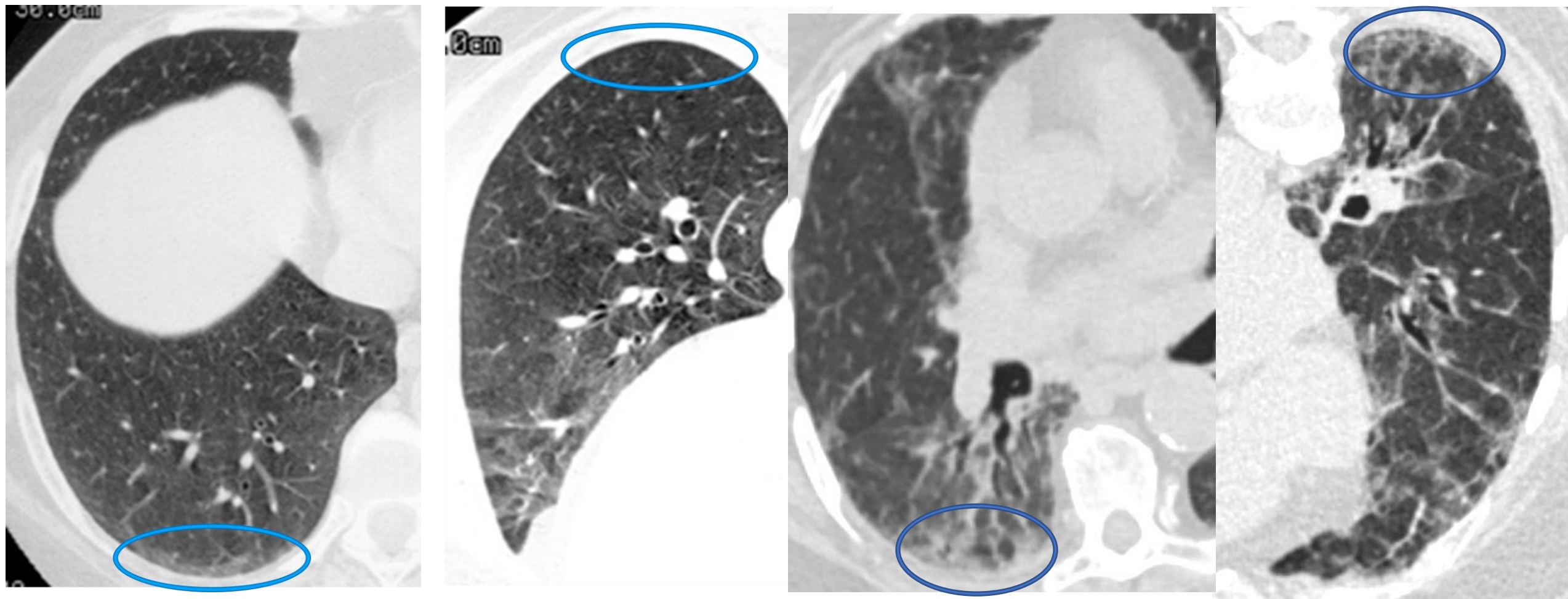
Pathology VS Physiology: Motion



Motion mimics disease



Pathology VS Physiology: Dependent Density



50-100 HU AP gradient difference

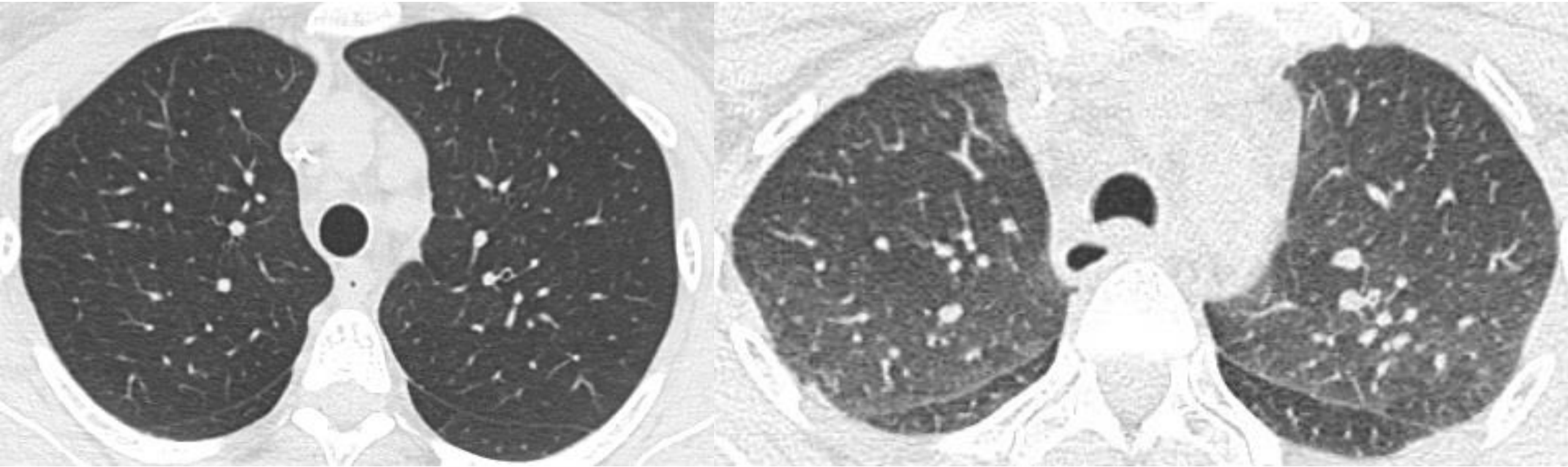
Rosenblum et al, Rad 1980; 137 (2): 409-416



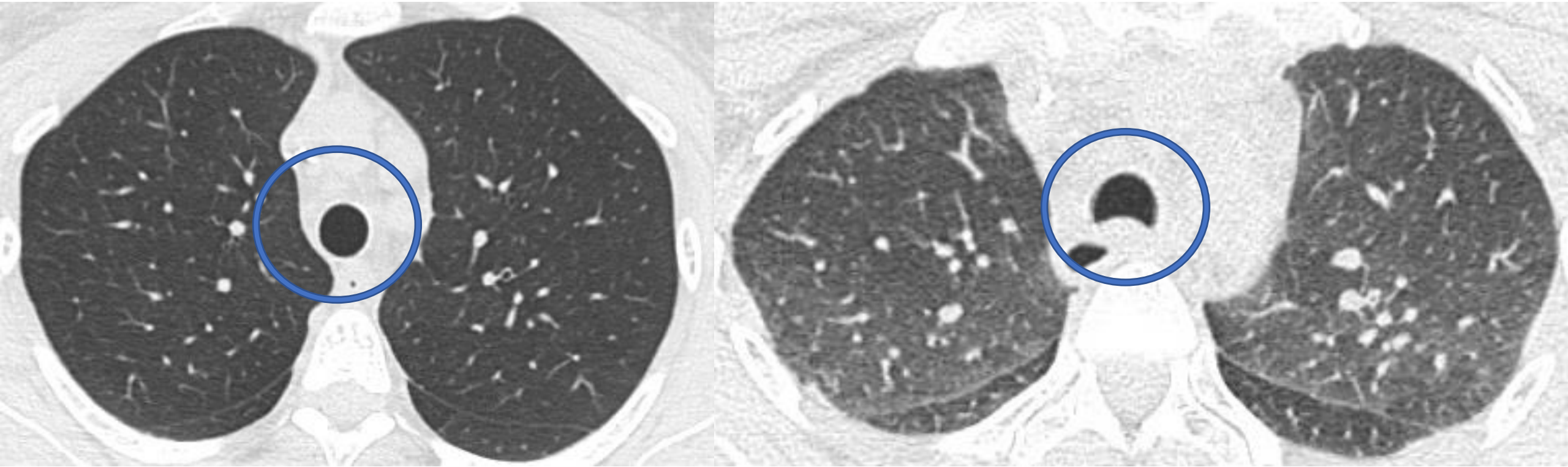
Pathology or Physiology?




Pathology or Physiology?



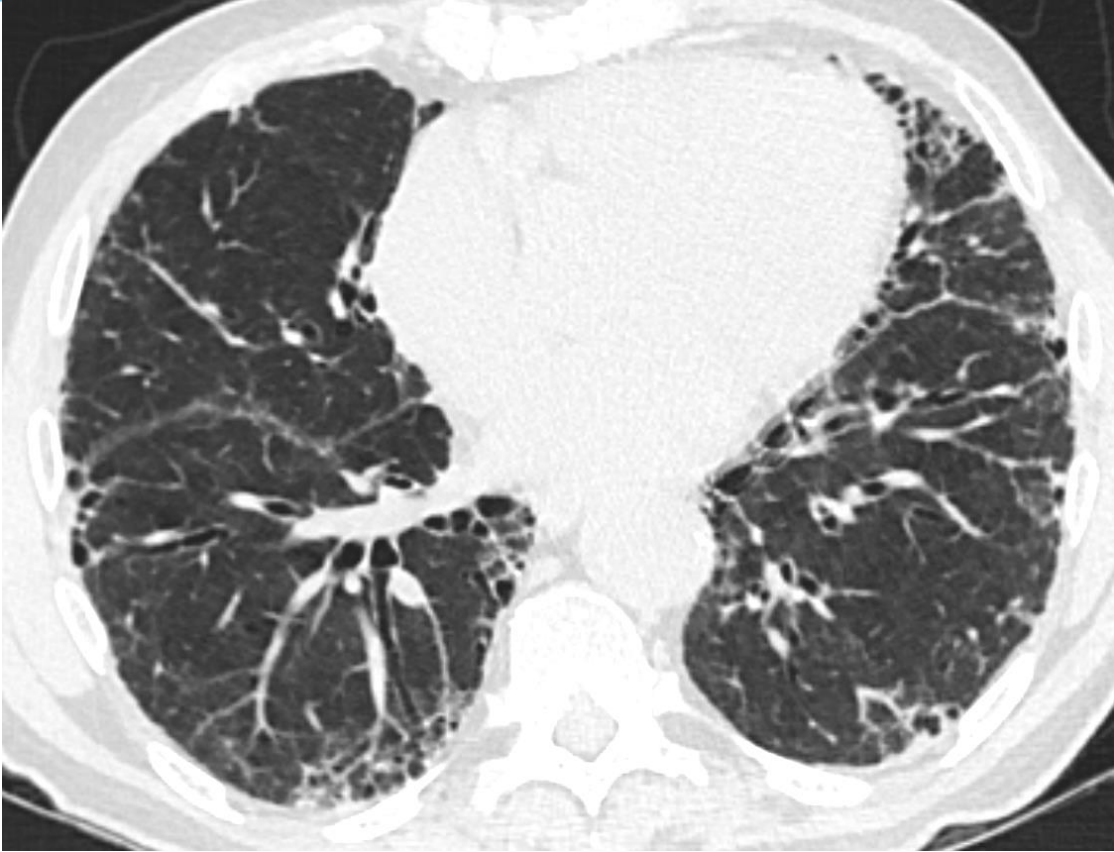
Pathology VS Physiology : Expiration



 Expiration 80-300 HU increase

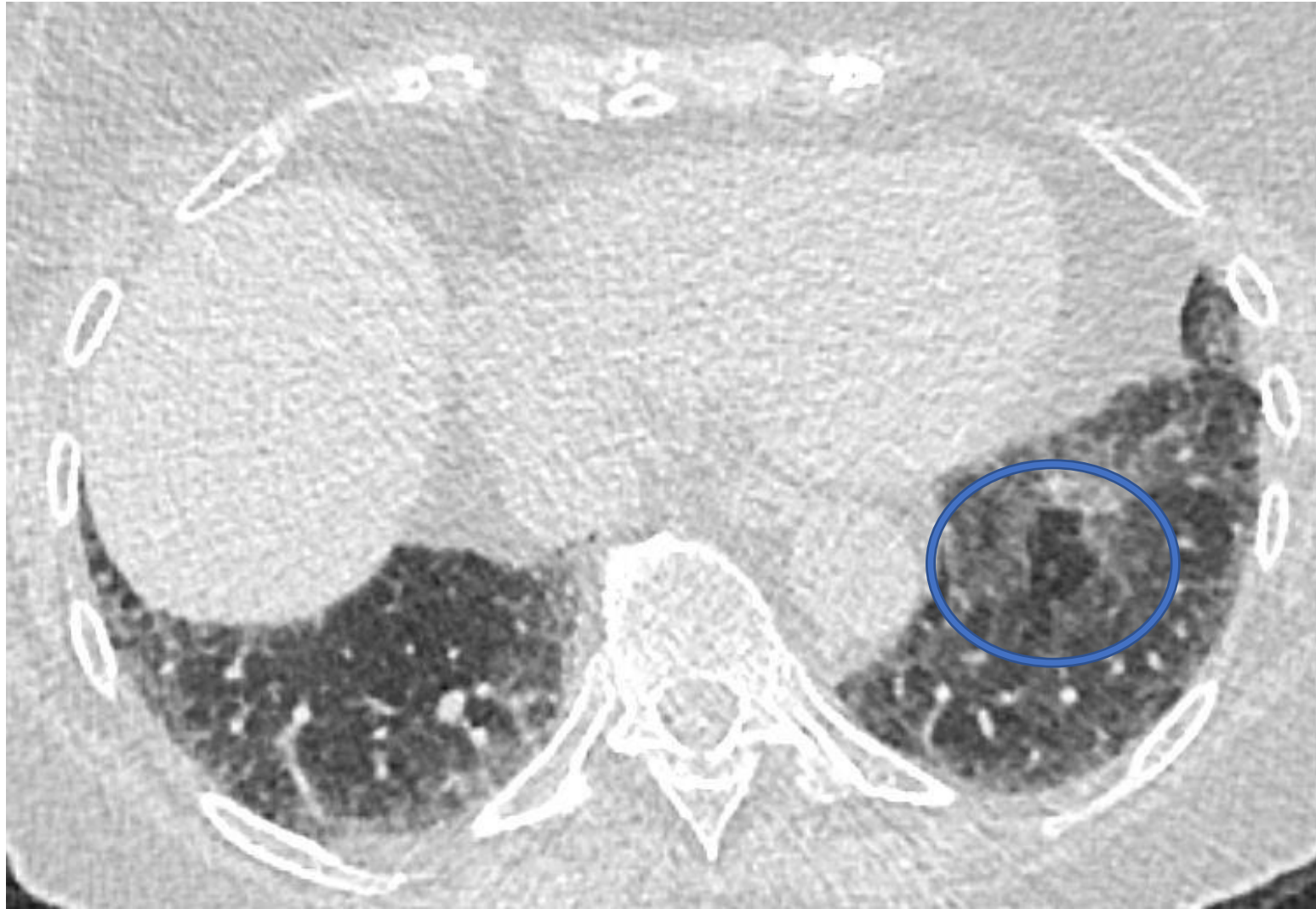
Robinson and Kreel, JCAT 1979;3(6):740-748

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

CT Signs of Fibrosis

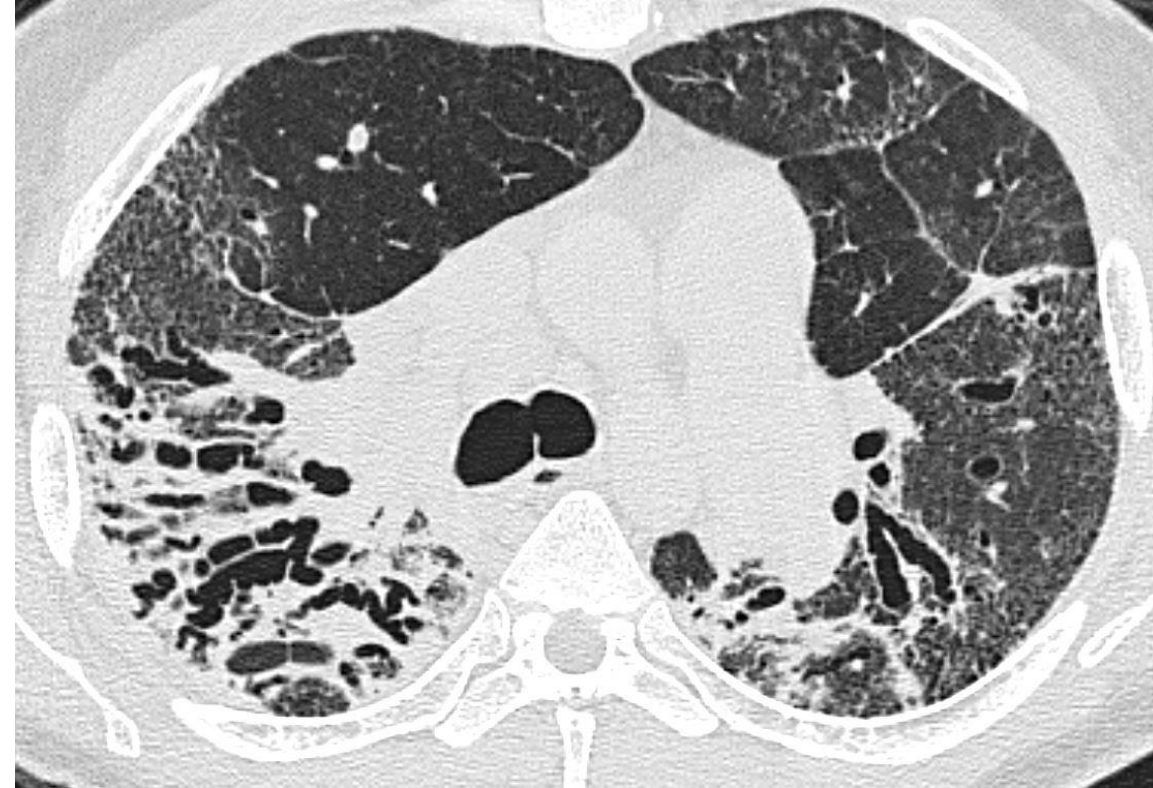
Architectural Distortion

Volume Loss

Reticulation

Traction Bronchiectasis

Honeycombing



CT Signs of Fibrosis

Architectural Distortion

Volume Loss

Reticulation

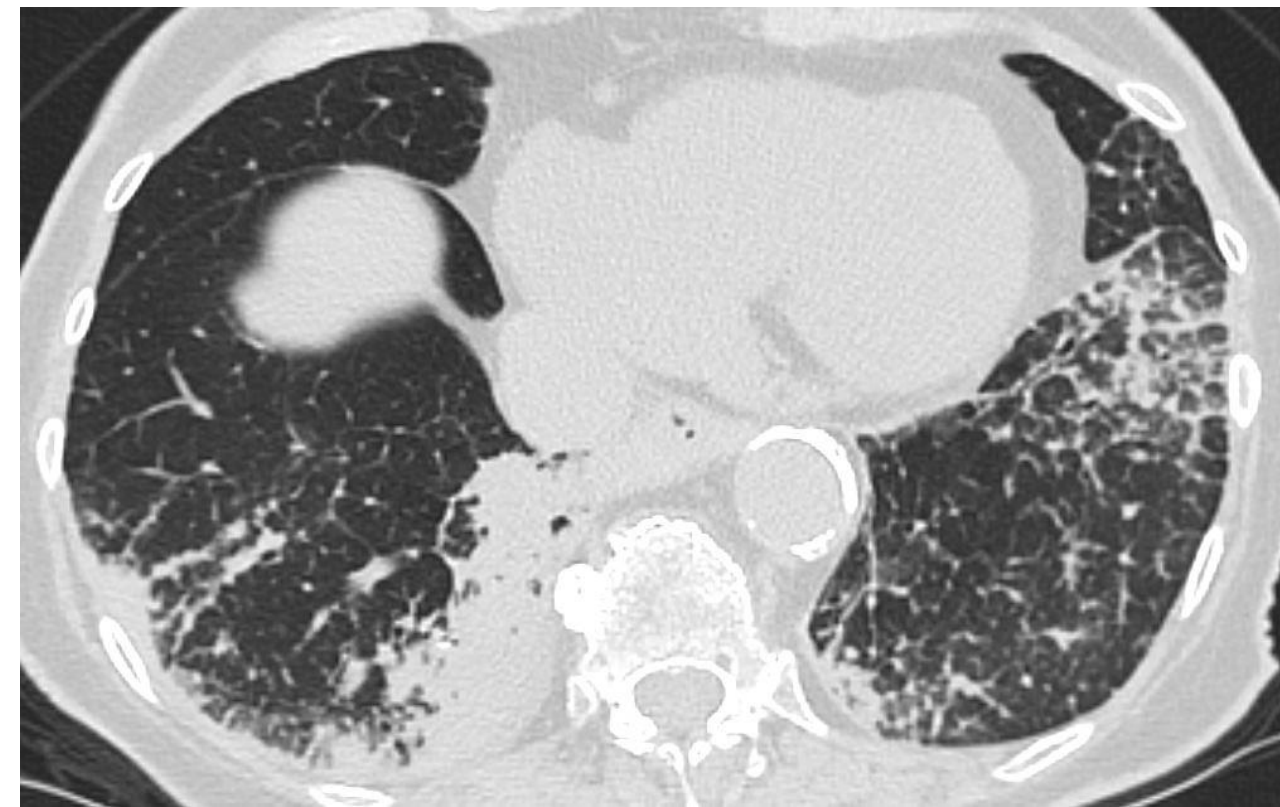
Traction Bronchiectasis

Honeycombing

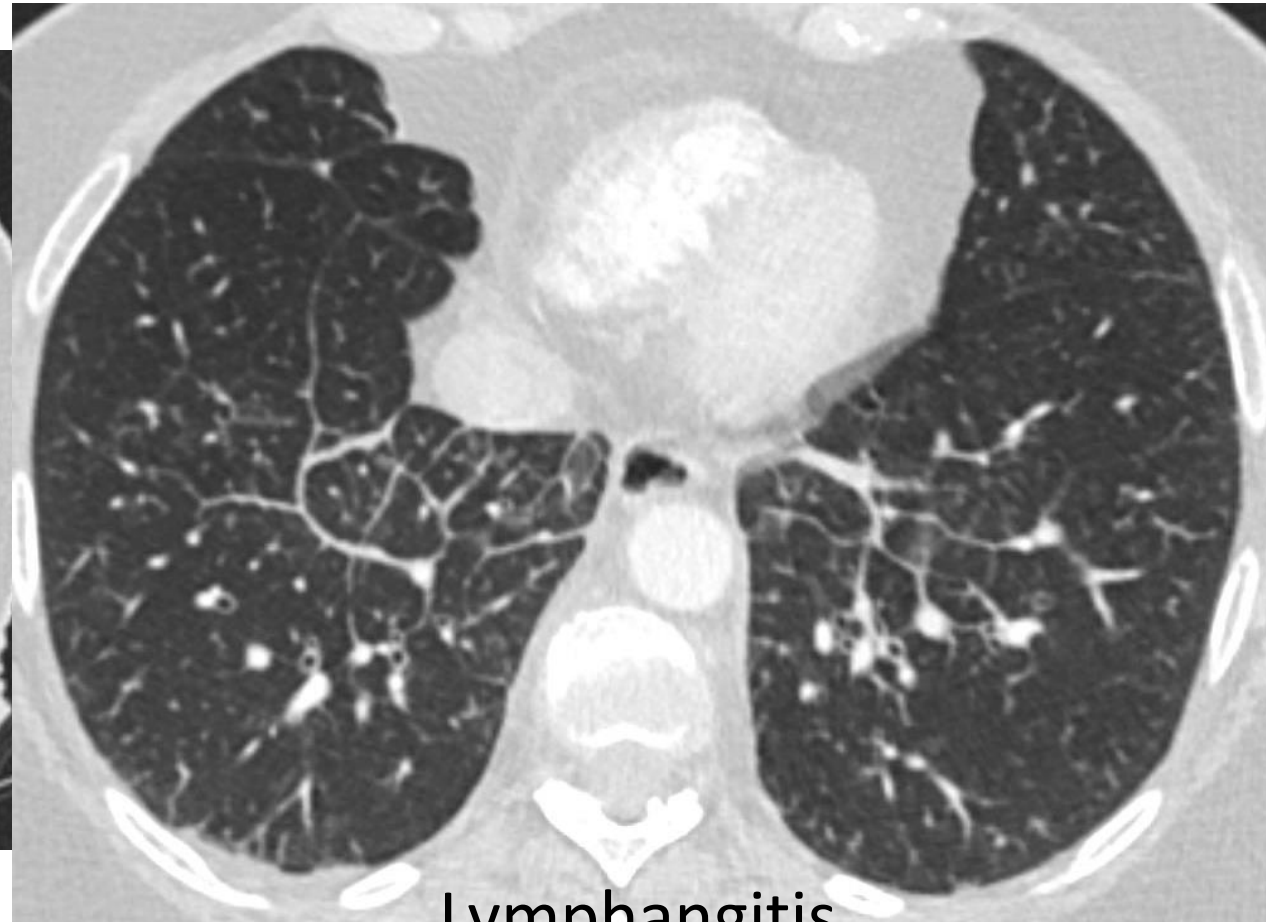


IRREVERSIBLE

Mimics of fibrotic reticulation



Amyloid



Lymphangitis
Carcinomatosa

Mimics of Traction Bronchiectasis

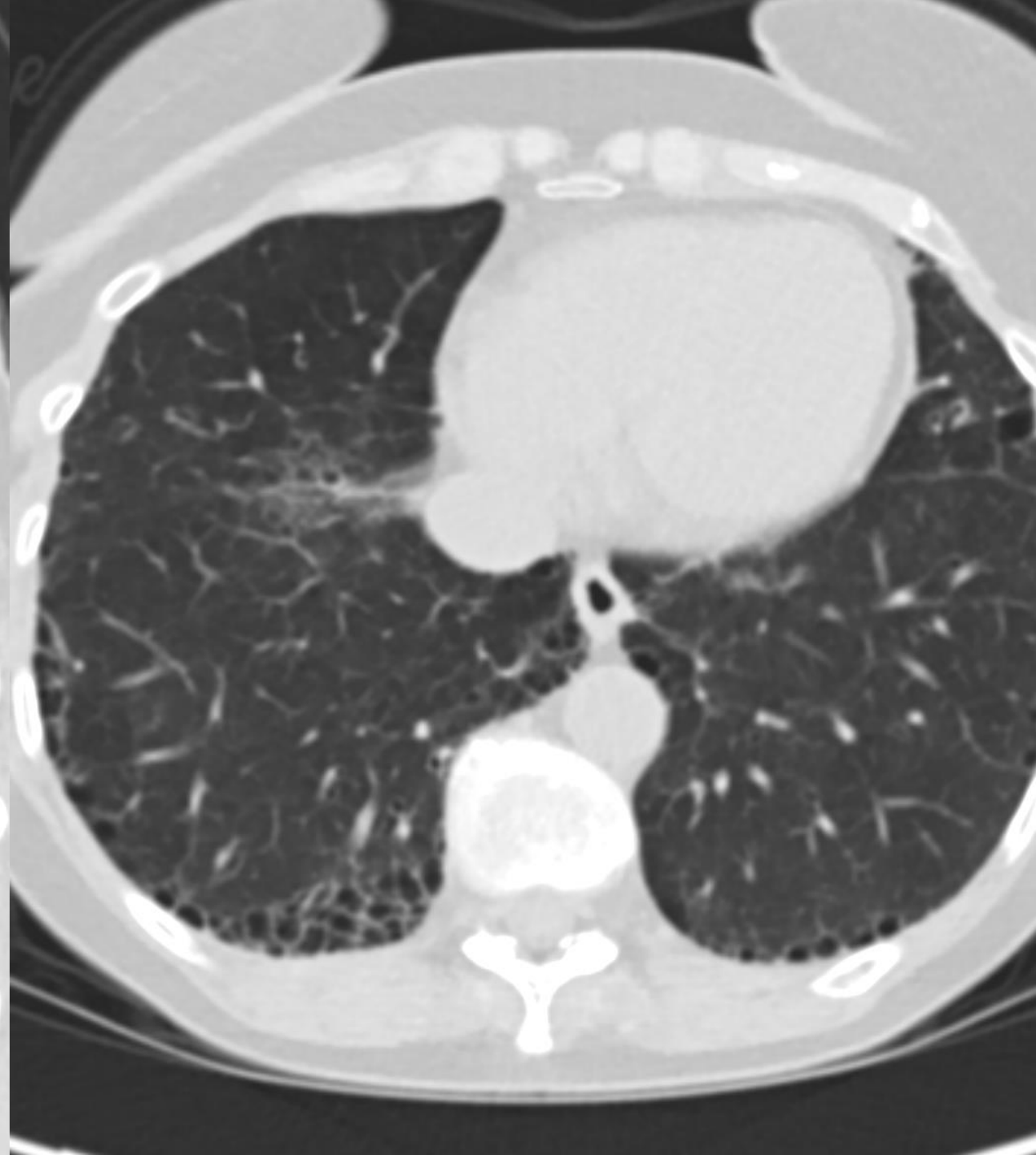
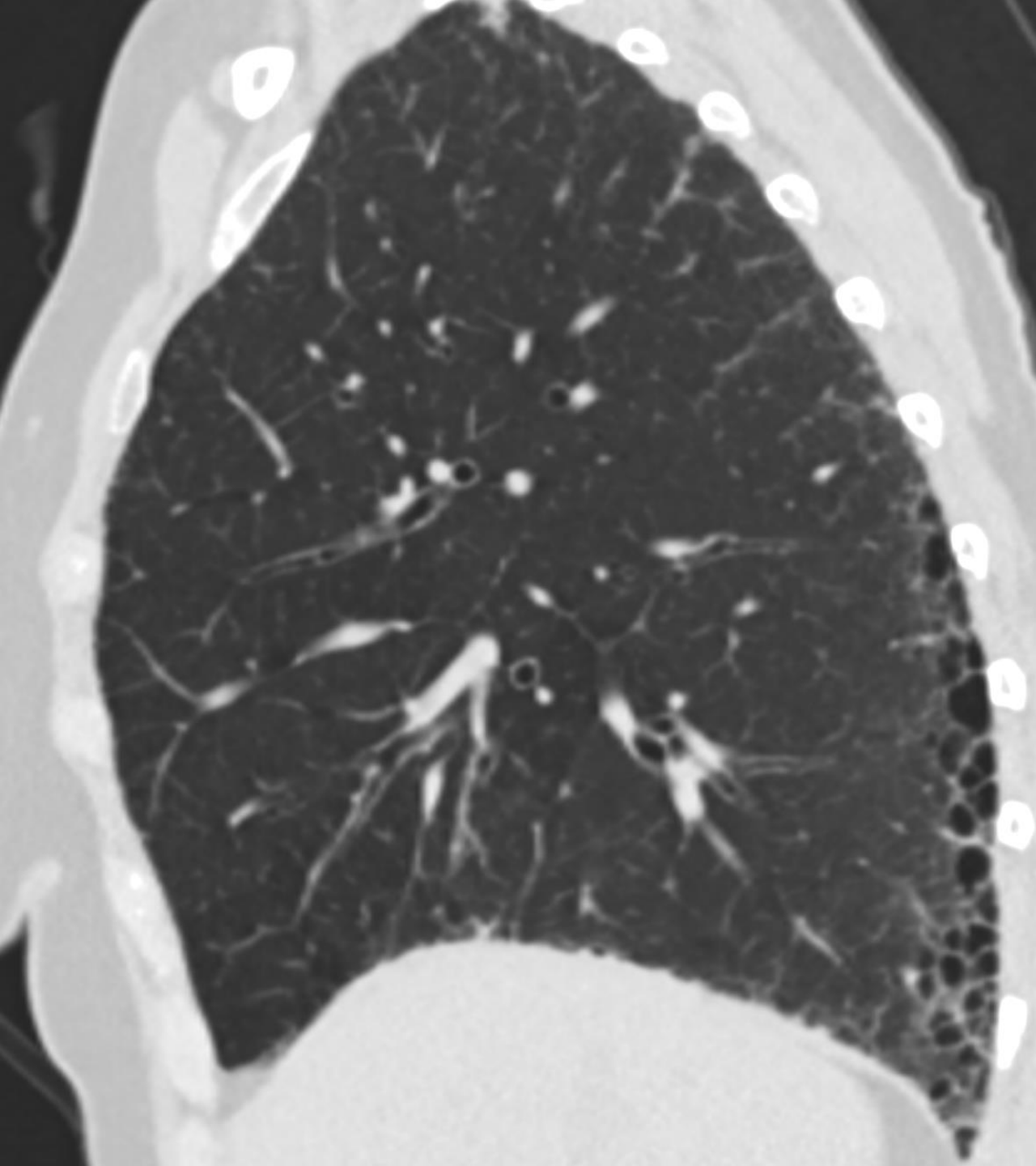


Mimics of Honeycombing

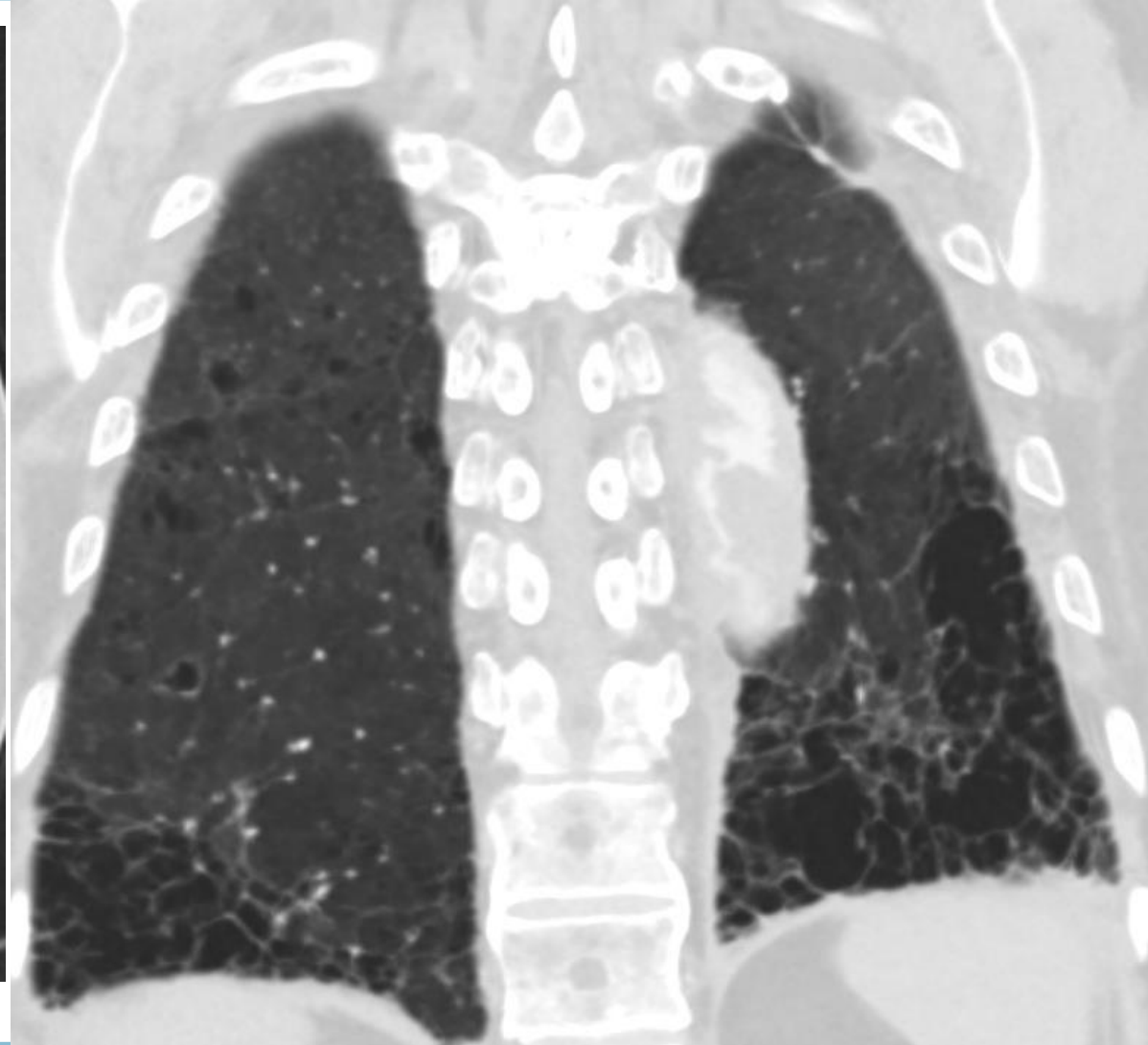


Paraseptal Emphysema

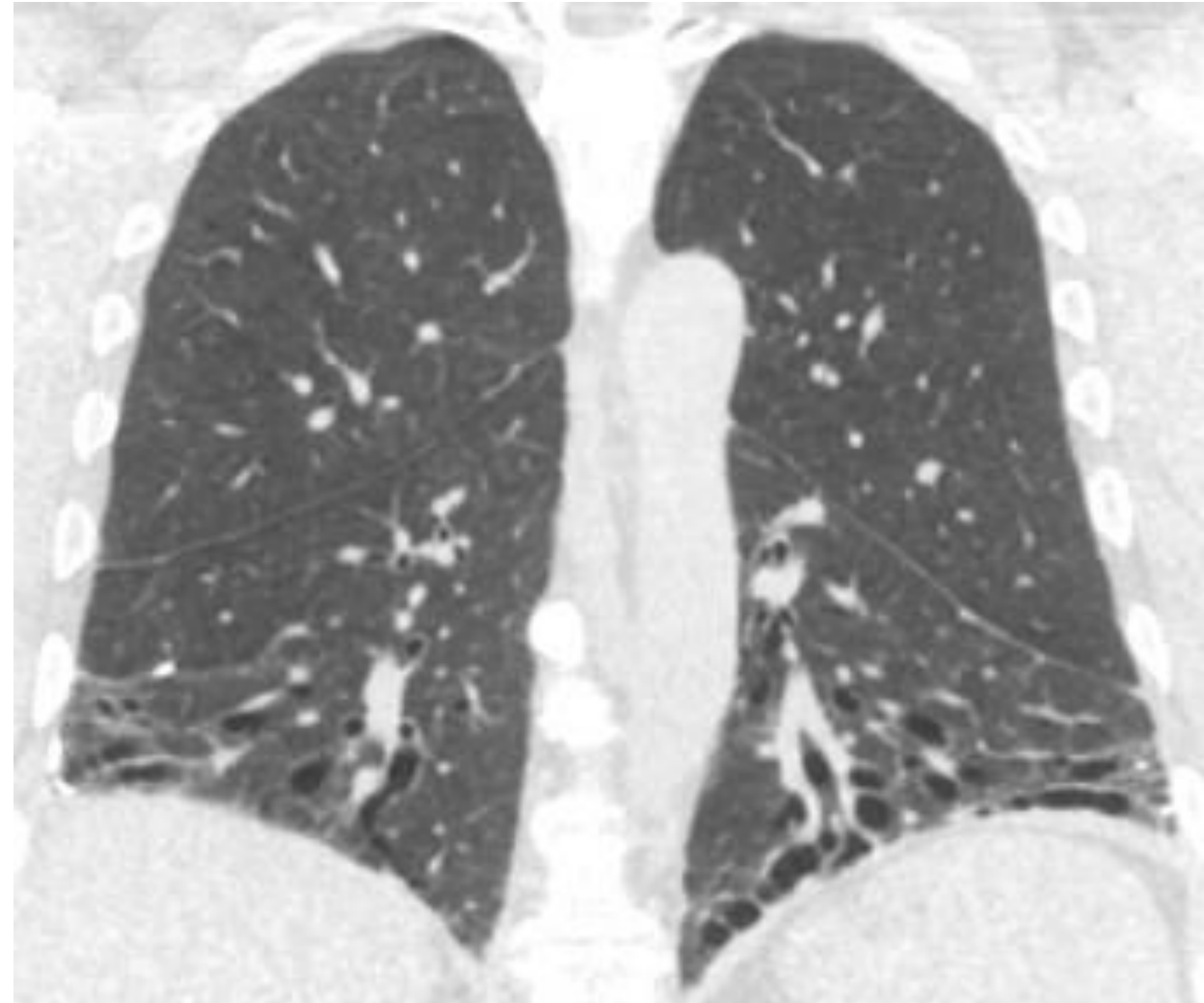




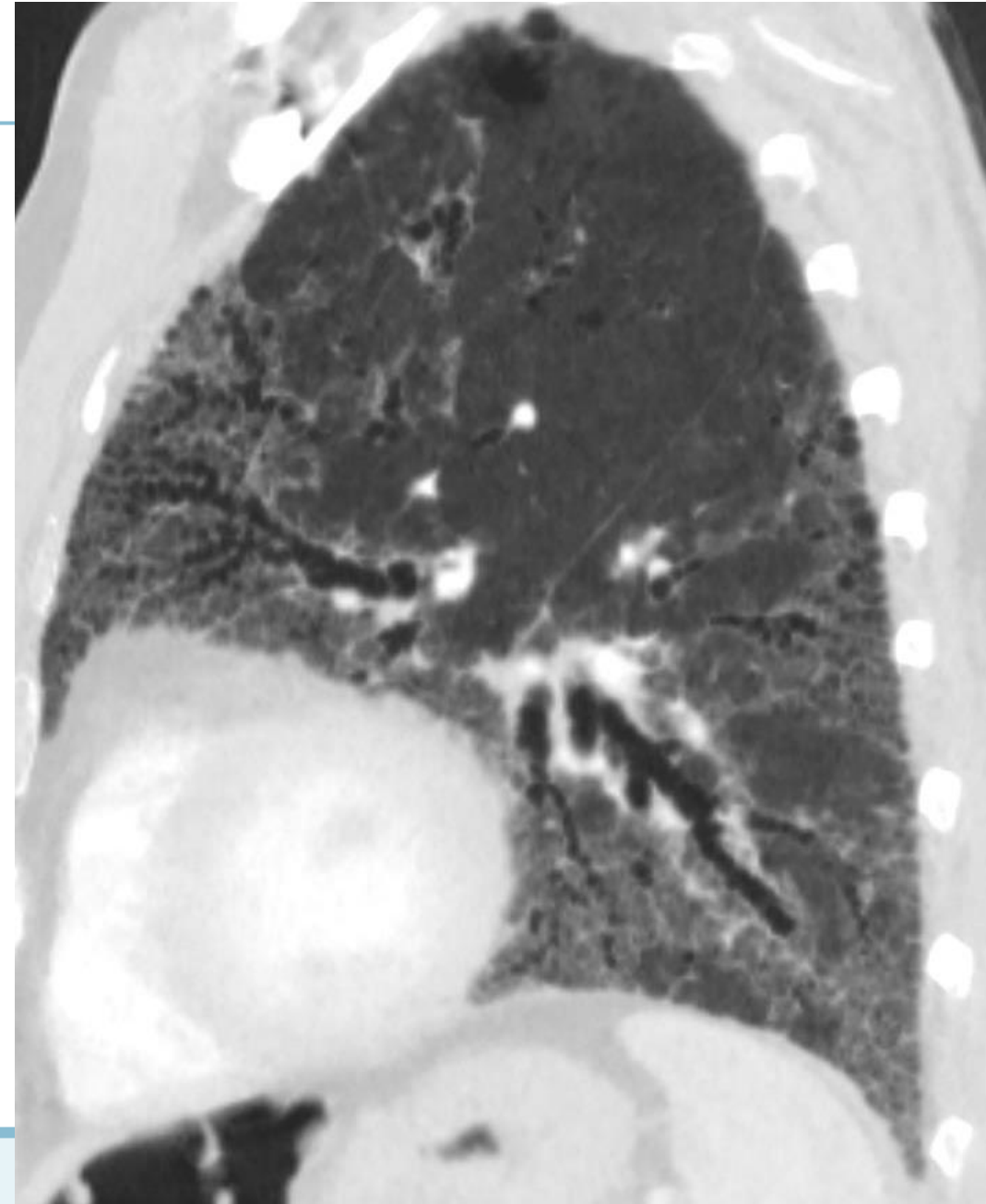
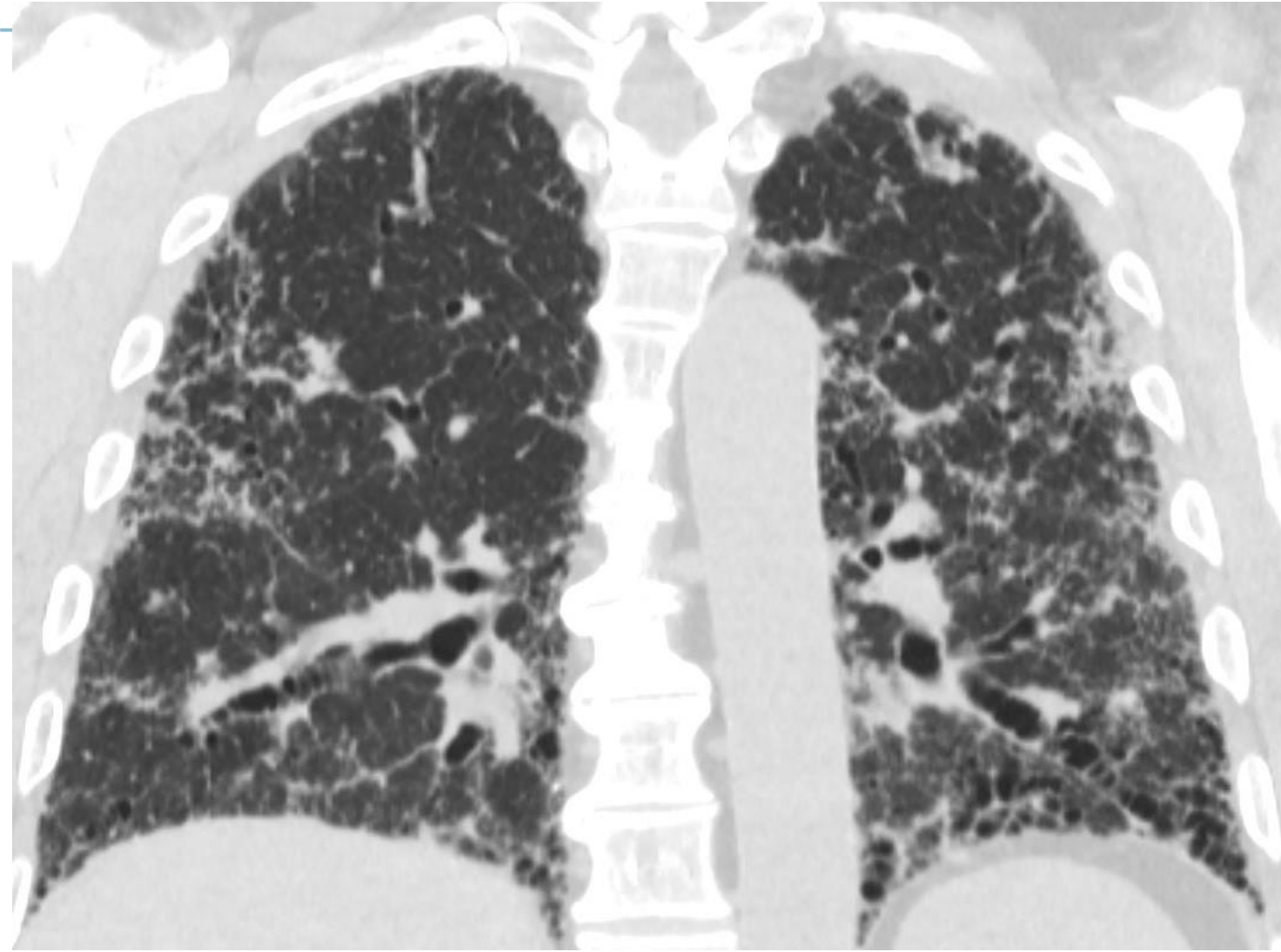
Mimic of Honeycomb cysts : Smoking Related Interstitial Fibrosis (SRIF)



Is it traction bronchiectasis or honeycombing?



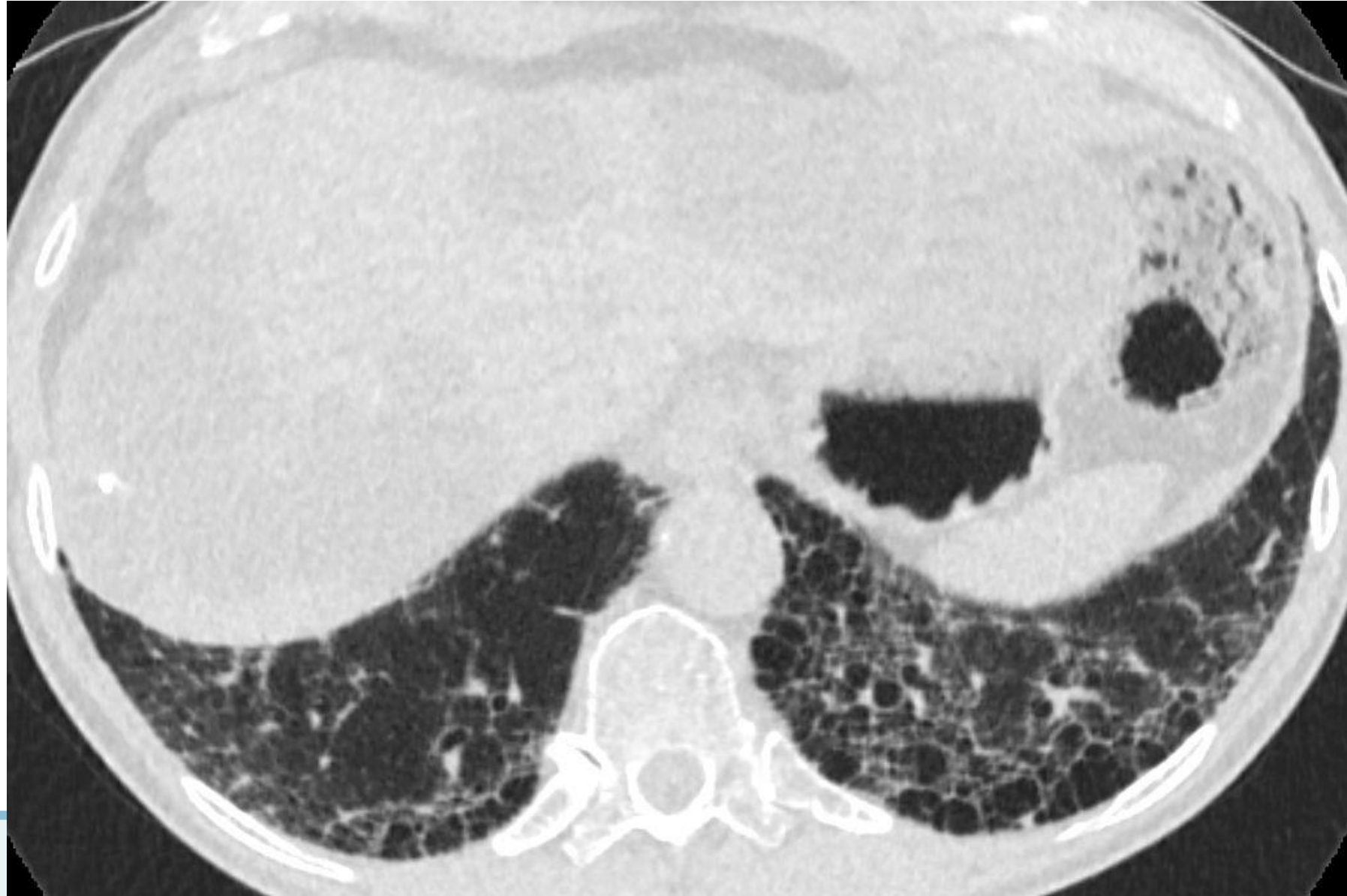
MPRs help



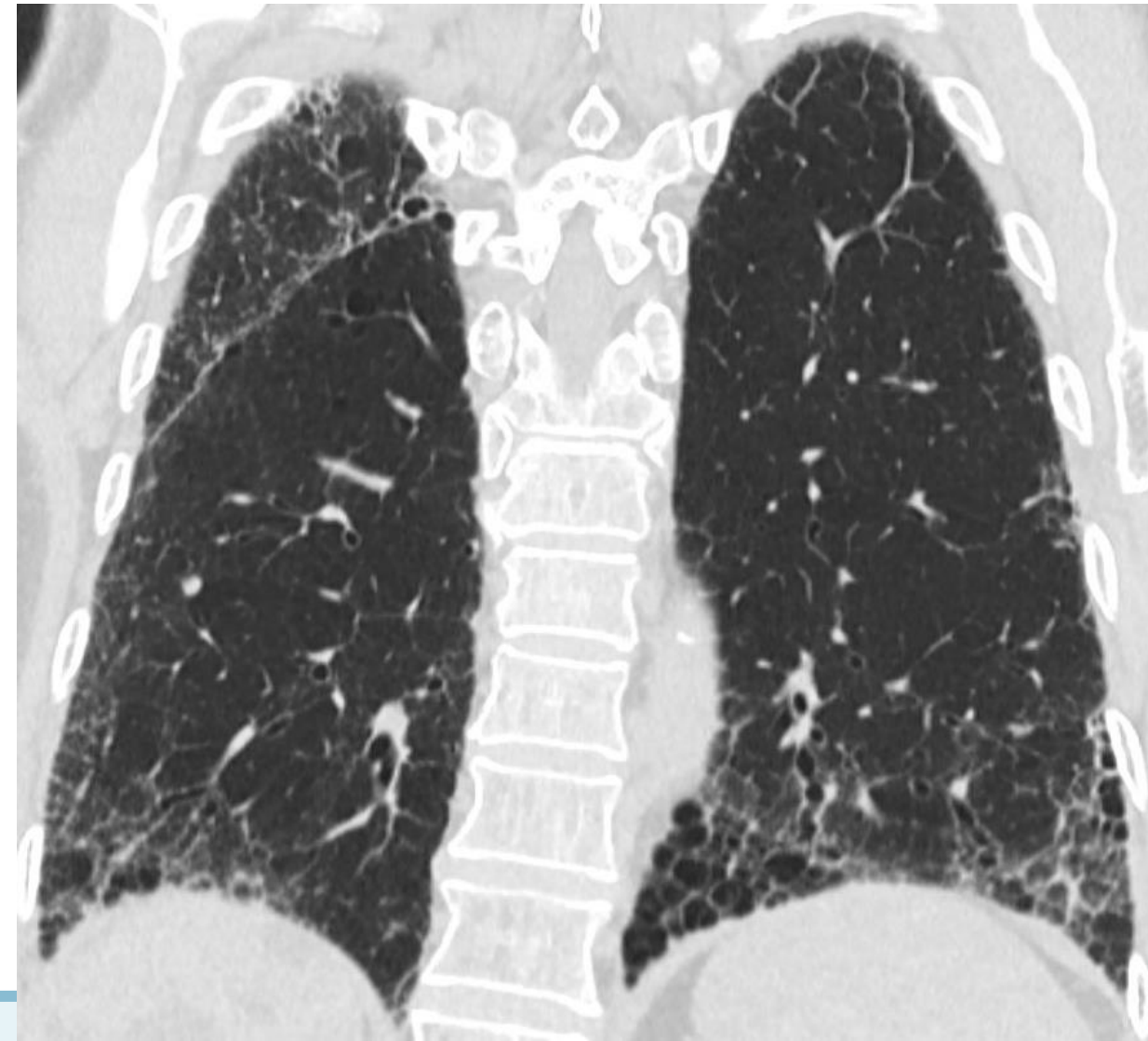
Combined Pulmonary Fibrosis and Emphysema



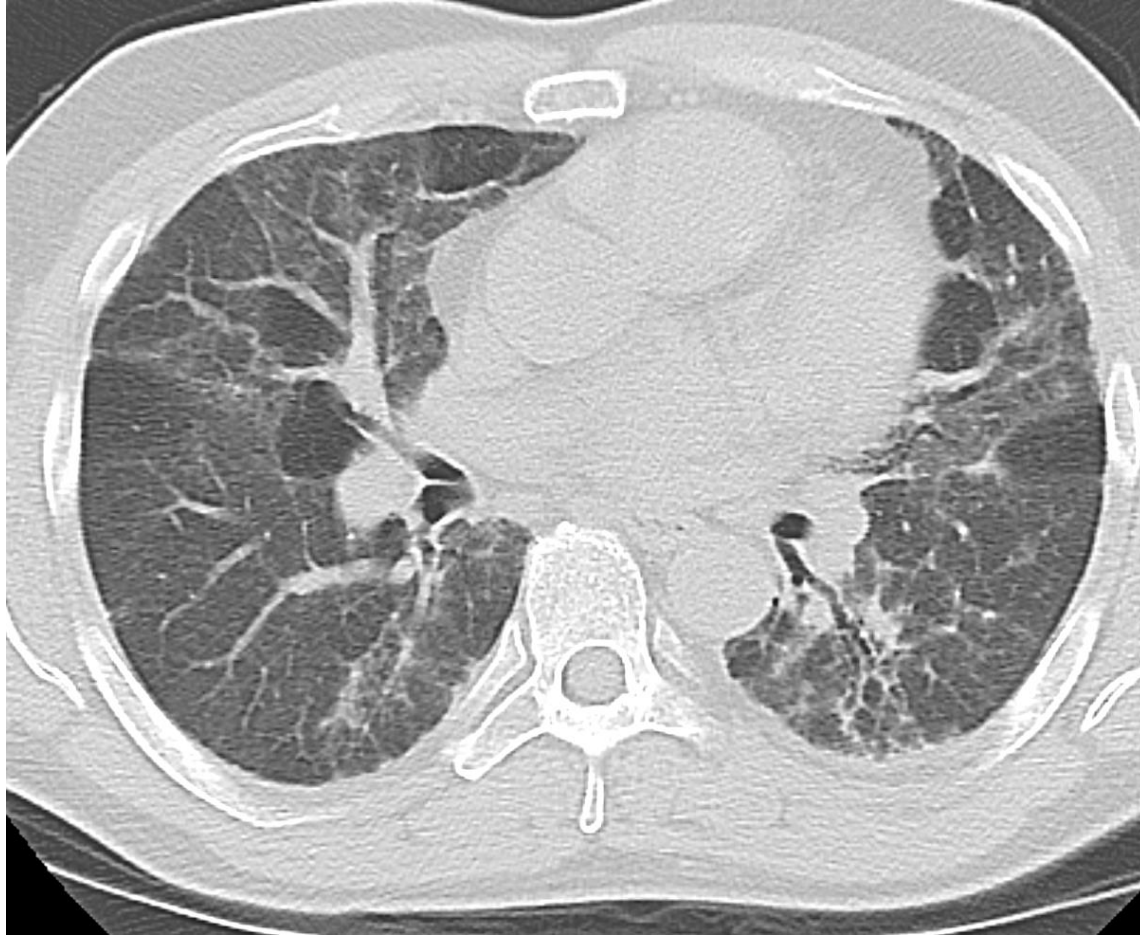
Combined Pulmonary Fibrosis and Emphysema



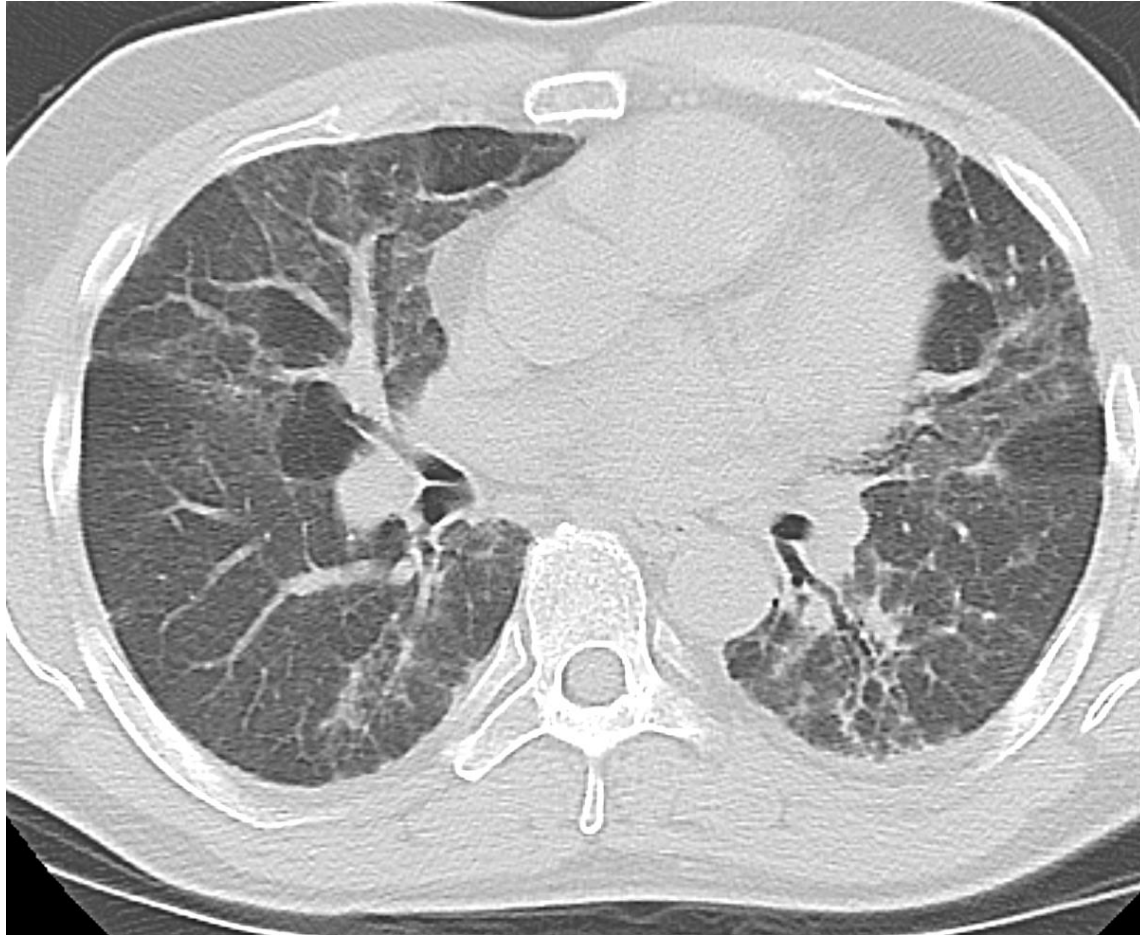
Combined Pulmonary Fibrosis and Emphysema



Air trapping in IPF



Air trapping in IPF



fHP



UIP and IPF

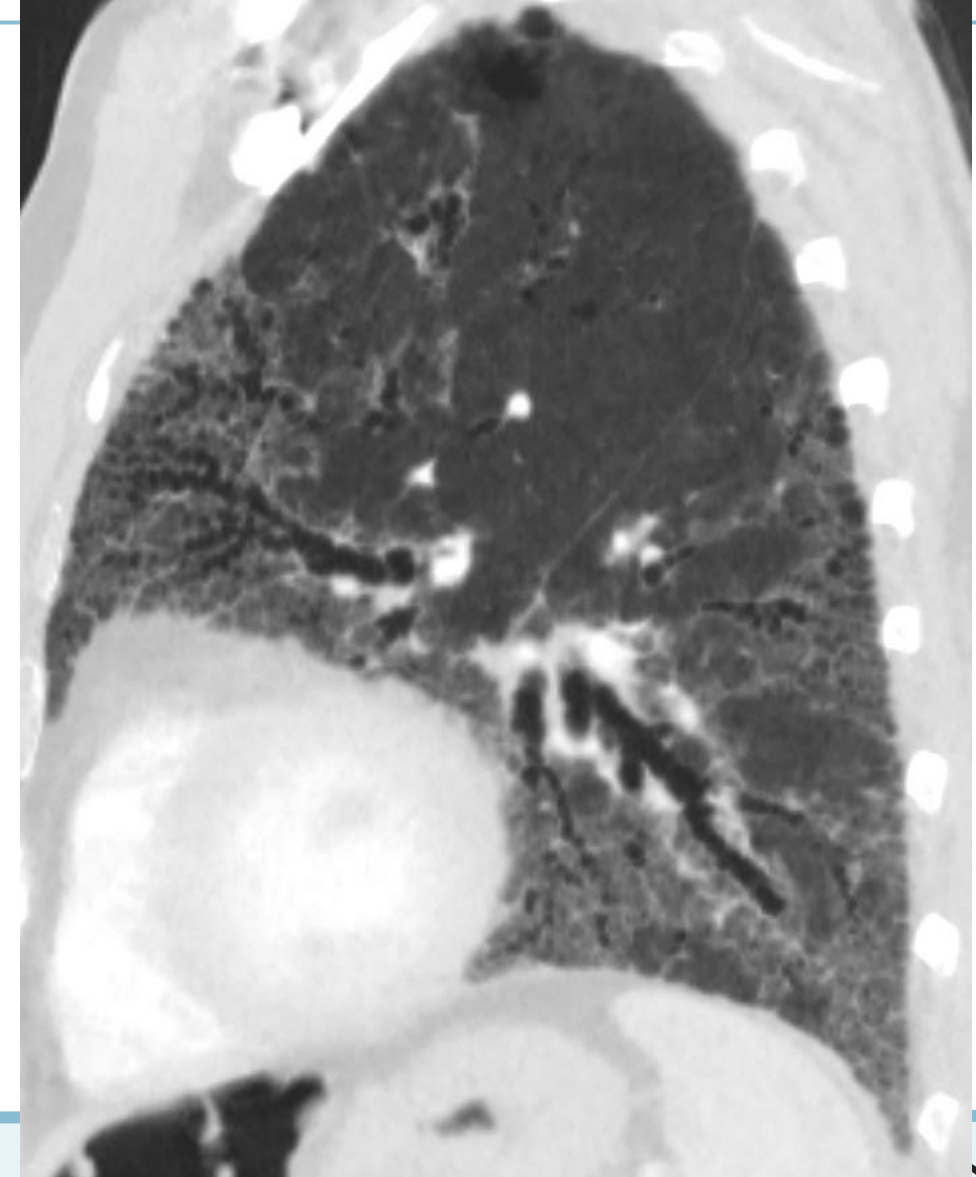
Summary

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