

# Basic Patterns on HRCT: Approach to Consolidations and Ground Glass Opacities

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# Disclosure of Commercial Interest

Neither I nor my immediate family members have a financial relationship with a commercial organization that may have a direct or indirect interest in this content.

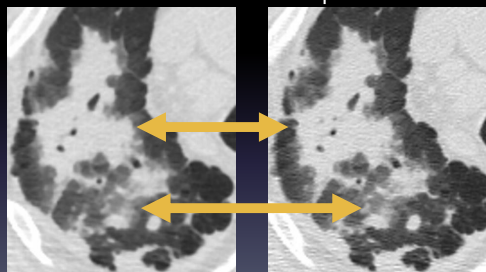
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# Basic Patterns on HRCT

- Septal Lines
- Micronodular Disease
- Cystic Lung Disease
- Consolidations and Ground Glass Opacities

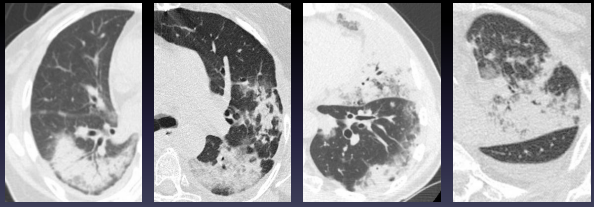
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# Interesting Point #1: The Least HRCT-specific



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Interesting Point #2:  
This has the broadest/most overlapping DDXs



Radiation      Organizing Pneumonia      Mucinous Adenocarcinoma      Coccidioidomycosis

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Three Keys to Being Useful

- Precise Language
- Specific Findings
- Considering the Clinical Context

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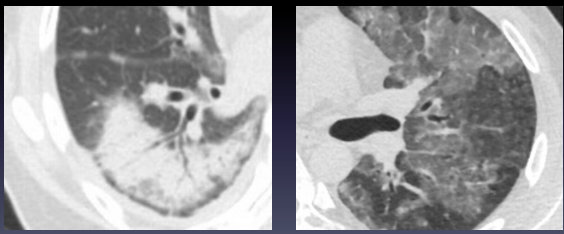
Part I: Precise Language

Not making up your mind:  
"Consolidative Infiltrative Nodular Ground Glass"

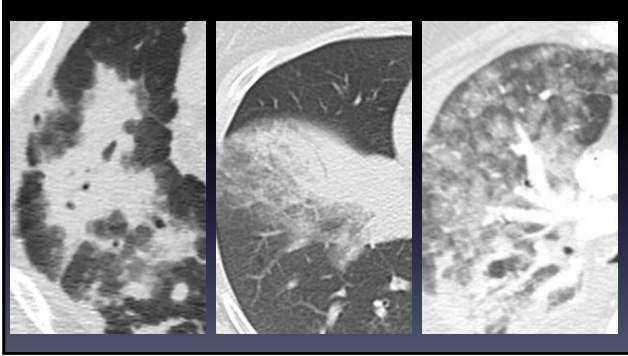
Using imprecise words:  
(reticulo-) nodular (opacity)

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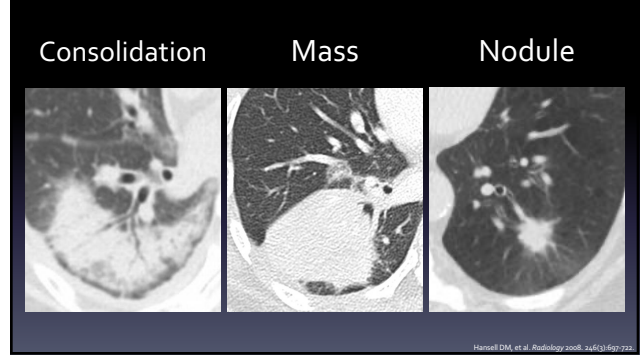
Consolidation      Ground Glass Opacity



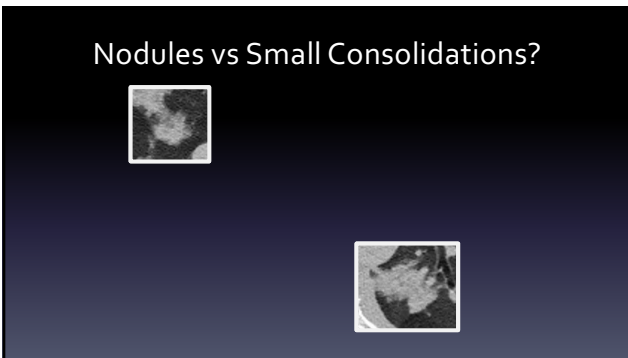
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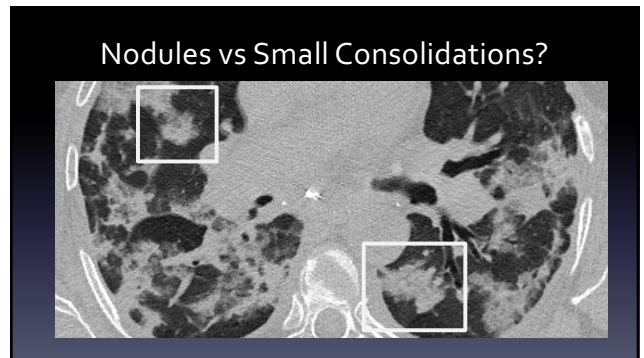
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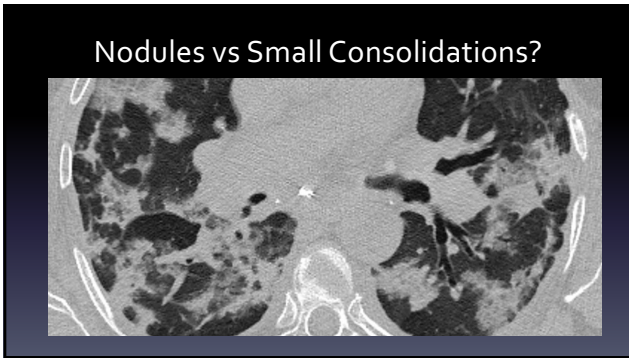
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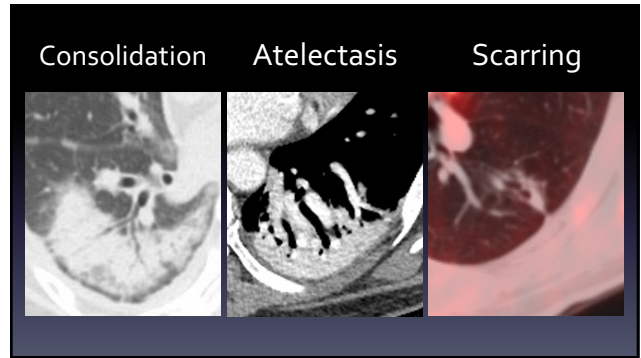
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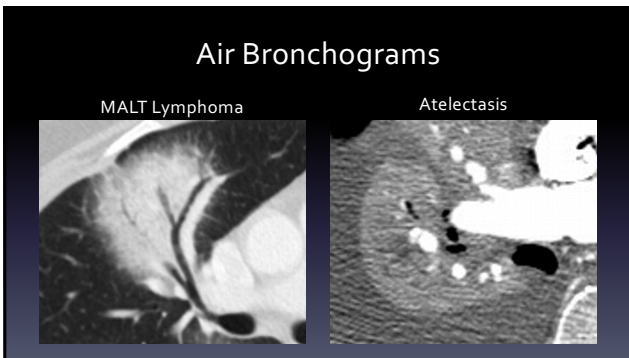
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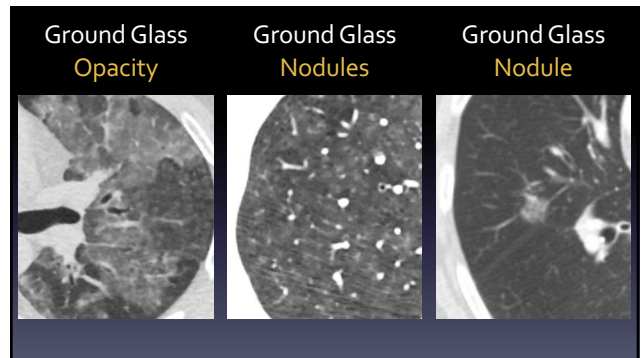
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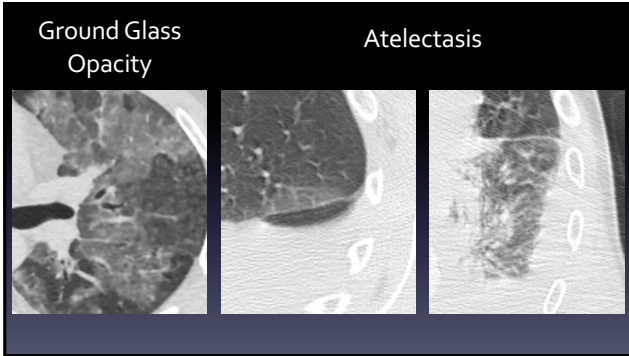
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Is it...

Ground-glass Opacity	Google
Ground Glass Opacity	4.3 M
Groundglass Opacity	4.3 M
Ground-glass	1.5 M

Hansell DM, et al. Radiology 2008; 246(3):697-722.

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Is it...

Ground-glass Opacity	Google
Ground Glass Opacity	4.3 M
Groundglass Opacity	4.3 M
Ground-glass	1.5 M

Hansell DM, et al. Radiology 2008; 246(3):697-722.

https://pixabay.com/en/bottle-cork-alcohol-wine-beverage-984420/

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Precise Language: Summary

Decide and describe.  
Your words drive the DDX.

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## Part II: Specific Findings

Exclude, highlight, or order potential diagnoses.

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## Specific Findings: Consolidations

Chronicity

Halo/Reversed Halo

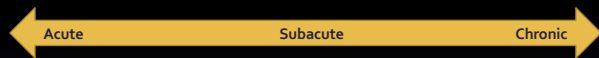
Associated nodules

Associated pleural abnormality

High/Low Density

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## Chronicity



AIP/DAD/Edema

Hemorrhage

Pneumonia/Aspiration

Organizing Pneumonia

Radiation

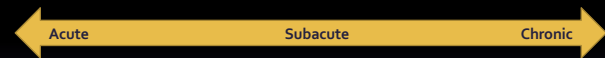
Lymphoma/Mucinous Adeno

Lipoid Pneumonia

Sarcoidosis

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## Chronicity

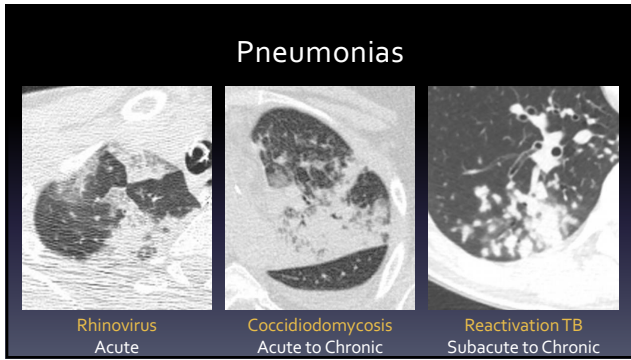


Pneumonia/Aspiration

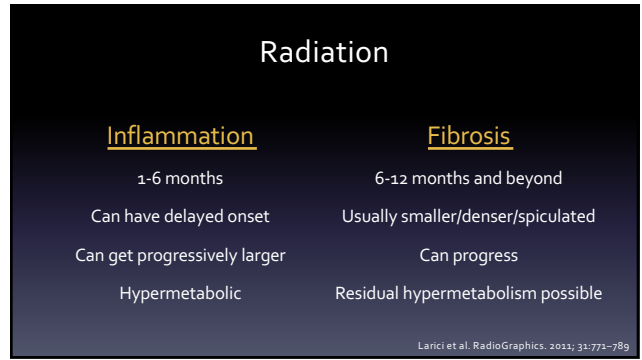
Radiation

Lymphoma/Mucinous Adeno

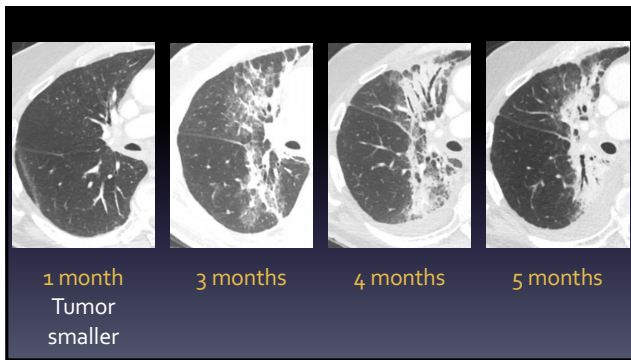
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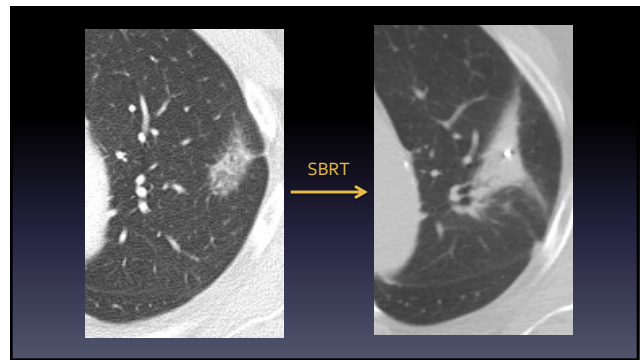
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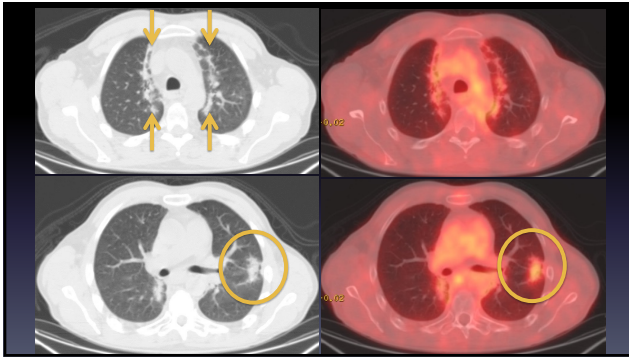
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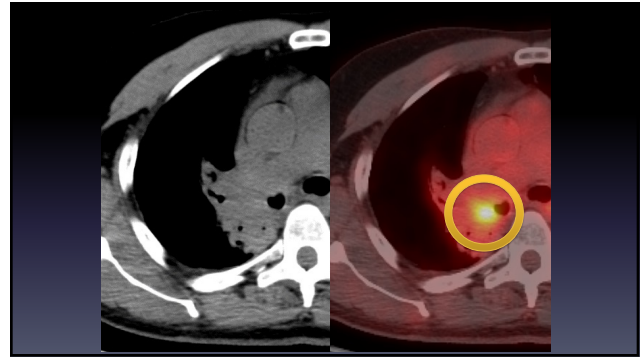
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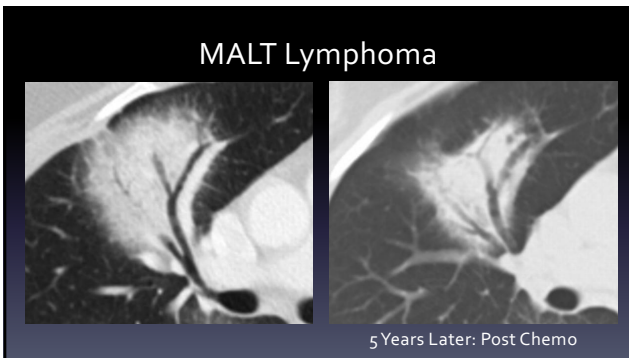
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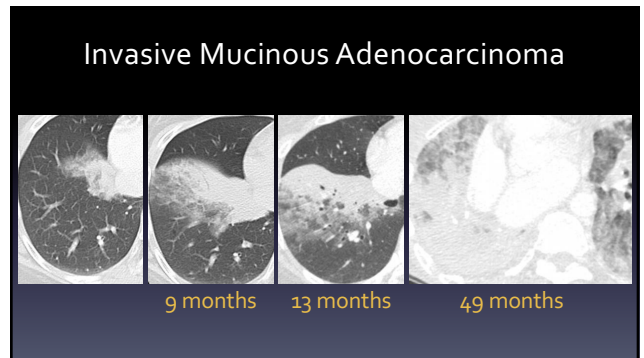
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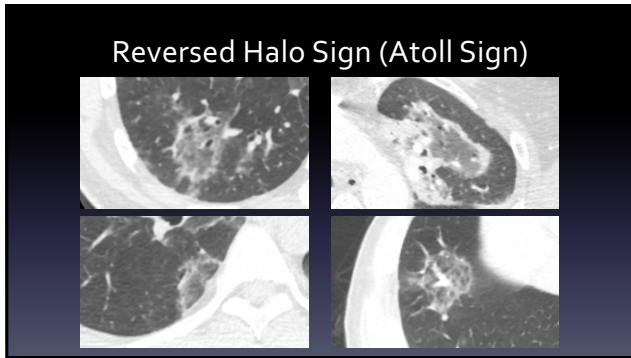


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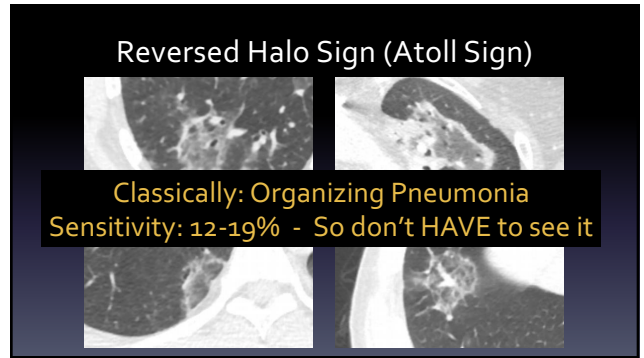


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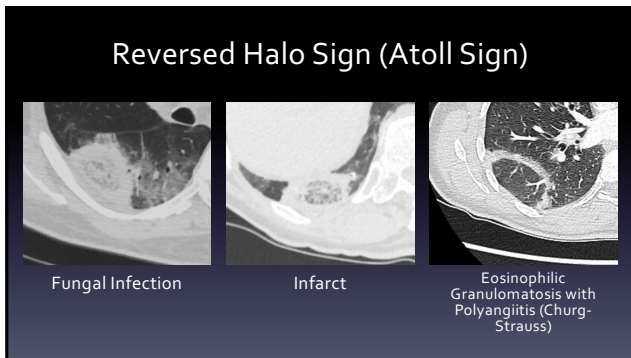




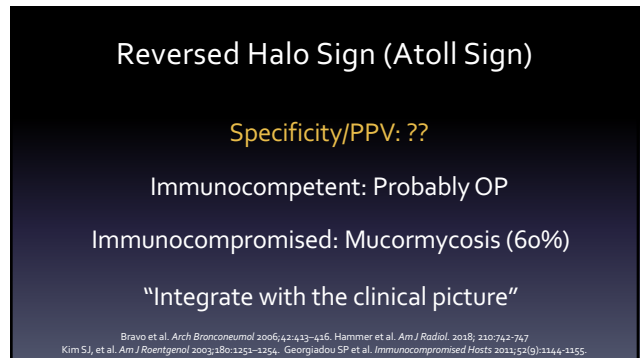
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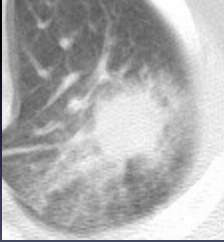
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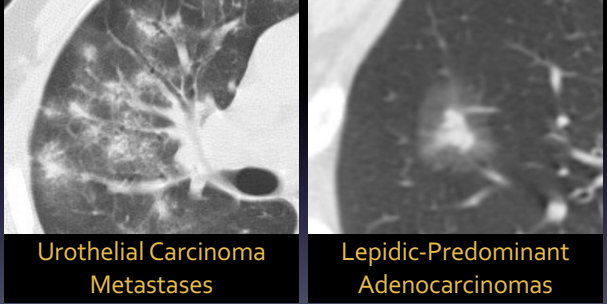
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### Halo Sign

- Around nodules
- Non-specific
- Invasive pulmonary aspergillosis



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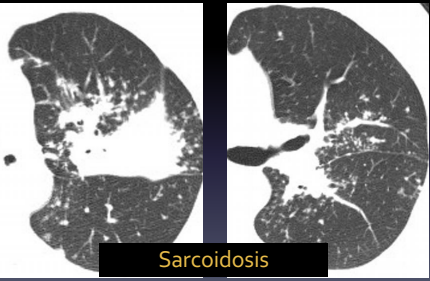


Urothelial Carcinoma Metastases

Lepidic-Predominant Adenocarcinomas

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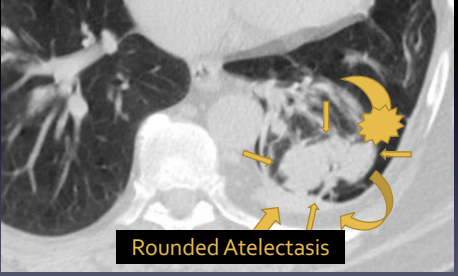
### Associated Nodules



Sarcoidosis

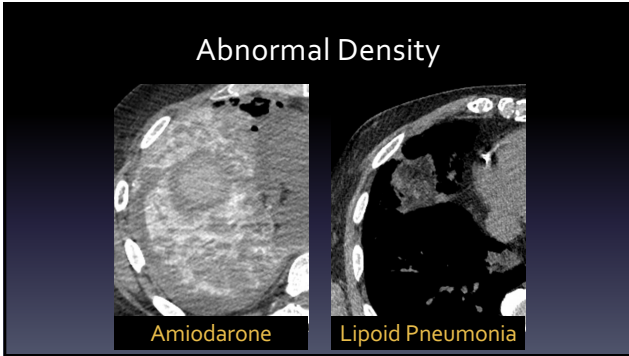
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### Associated Pleural Abnormality



Rounded Atelectasis

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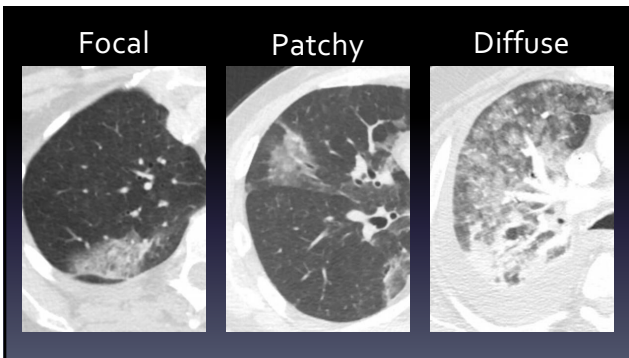


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Specific Findings: Ground Glass Opacity

- Focal/Patchy/Diffuse
- Chronicity
- Associated Septal Thickening
- Associated Air-trapping
- Specific ILD patterns

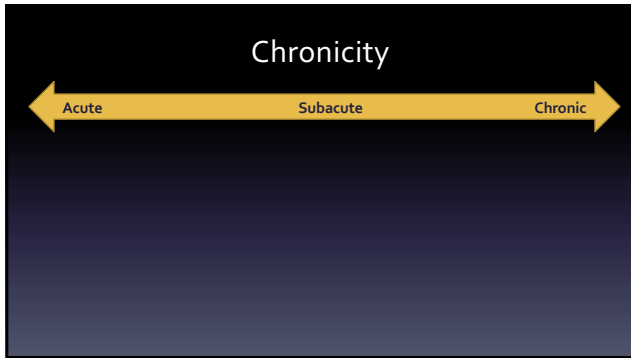
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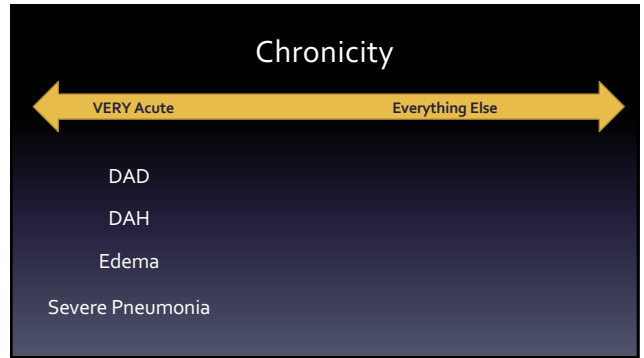
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Focal	Patchy	Diffuse
Some Infections Radiation Focal Bleeding Aspiration (Lots of Others)	Organizing Pneumonia (Lots of Others)	Some Infections Severe Edema Diffuse Alveolar Damage (Lots of Others)

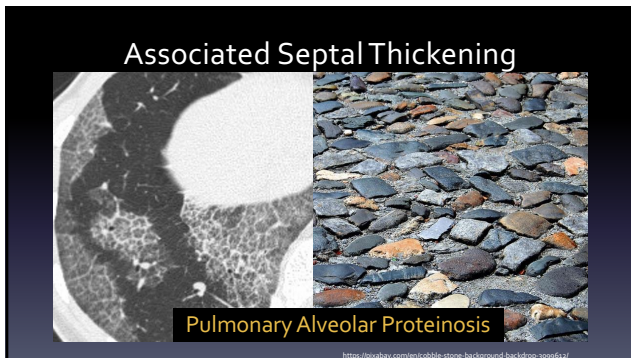
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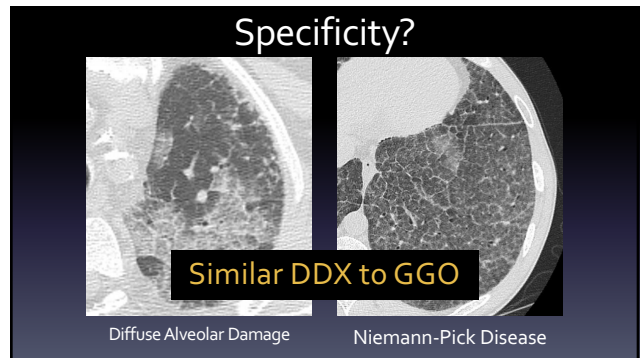
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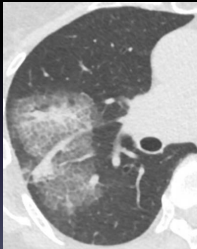


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### Crazy Paving



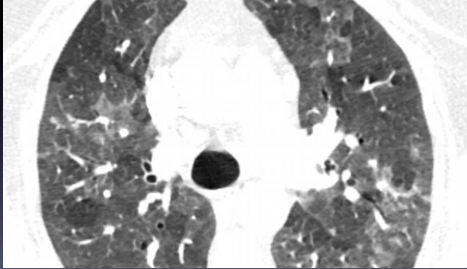
- Most common:
  - Diffuse Alveolar Damage
  - Pneumonias
  - PAP: rare, but high prevalence
- Most are acute and **not** PAP.

Johkoh T, et al. Radiology 1999; 111:152-156.  
Murayama S, et al. J Comput Assist Tomogr 1999; 23:749-752.  
Ellicker et al. Radiol Clin N Am 2016; 54:1119-1132.

Radiation

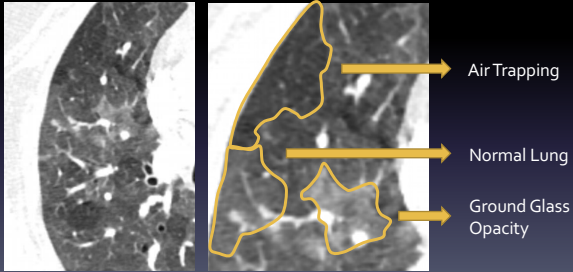
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### Associated Air Trapping



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### Associated Air Trapping



Air Trapping

Normal Lung

Ground Glass Opacity


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### Headcheese Sign



niTHer.

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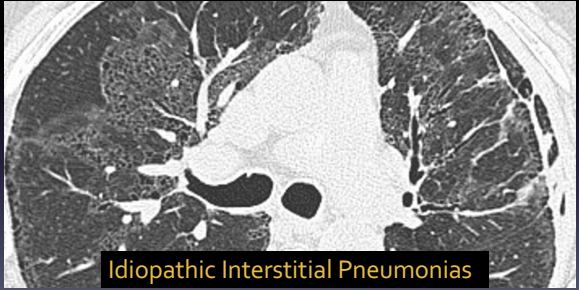


- Most common: Hypersensitivity Pneumonitis
- GGO and Airways Disease: Pneumonias, lymphoid interstitial pneumonia, & others

[https://en.wikipedia.org/wiki/Head\\_cheese](https://en.wikipedia.org/wiki/Head_cheese)

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### Specific ILD patterns



**Idiopathic Interstitial Pneumonias**

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### Part III: Considering the Clinical Context

Precise characterization and specific findings will only get you so far.

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### Complete Differential

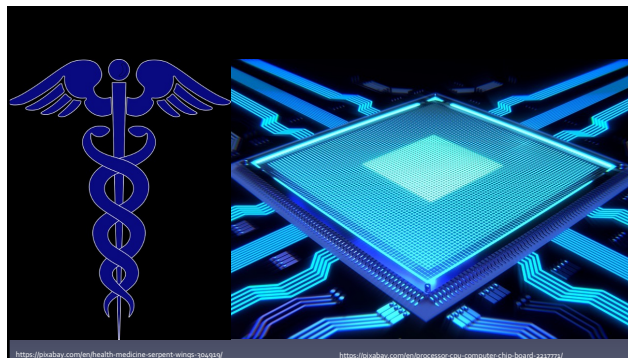
<u>Injury</u>	<u>Infection</u>	<u>Inflammatory</u>	<u>Idiopathic</u>
Organizing PNA	Viral	Eosinophilic dz	PAP
DAD	Bacterial	Vasculitis	Sarcoidosis
AIP	Others		
<u>Exposure</u>	<u>Systemic</u>	<u>Malignancy</u>	<u>Rare</u>
HP	Fluid overload	Lymphoma	Neimann-Pick
DIP	Collagen Vascular	Adenocarcinoma	
Drugs/XRT			

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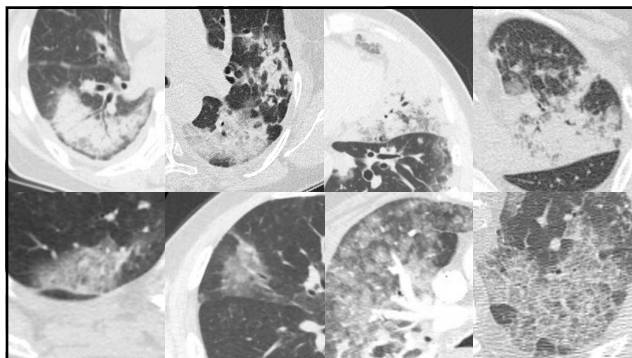
**Clinical Context**

Time Course	Exposures
Symptoms	Treatments
Rick Factors	Other Tests
Demographics	Past Medical History

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**Three Keys to Being Useful**

- Precise Language
- Specific Findings
- Considering the Clinical Context

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## References

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## Thank you!

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Approach to Consolidations and Ground

Glass Opacities

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