**Thoracic Radiology:** Interstitial lung disease.

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1 **Objectives**

   1. Describe radiology's role in lung diseases
   2. Review relevant lung anatomy
   3. Review types of interstitial lung disease (ILD)
   4. Define imaging patterns that can be used to identify lung diseases
   5. Apply imaging patterns to cases to narrow a differential diagnosis

2 **Brief overview summary**

This lecture starts with an overview that radiology findings are important to diagnose lung disease, presenting the idea that groups of findings on imaging are used to define patterns, which set up a differential diagnosis. Lung anatomy is briefly reviewed with a focus on the secondary pulmonary lobule. Imaging examples are shown, starting with normal Xray's and CT's, followed by cases that demonstrate specific findings in interstitial lung disease. Patterns of findings that define specific lung diseases are reviewed. The lecture finishes with example cases of specific diseases which demonstrate how patterns on imaging are used to diagnose lung disease.

3 **Key terms**

   **Secondary pulmonary lobule** – The smallest anatomic unit of the lung which is surrounded by connective tissue septae

   **Interstitial opacities** – Chest Xray findings seen when some process affecting the lung interstium makes it visible on imaging

   **Airspace opacities** – Chest Xray finding when some process has caused filling of the alveolar spaces of the lung.
Kerley B lines – linear markings on the edges of the lungs on chest Xray. These are a type of interstitial opacity and generally considered a sign of pulmonary edema.

Ground glass opacities – an opacity on Chest CT which other lung structures can be seen through.

4 Key take away points

1 In chest imaging, groups of imaging findings define patterns. Each patterns has a differential diagnosis of clinical diseases.

2 The secondary pulmonary lobule is an important anatomic structure for imaging because it should not be seen on a normal study but often becomes visible in the setting of lung disease.

3 The most basic description of a lung finding on a CT or X Ray is whether it involves the interstitial space or the airspace (alveoli). Several signs can help distinguish the 2 including Kerley lines (interstitial) and air bronchograms (airspace)

4 The end result of chronic lung injury is often fibrosis. Fibrosis occurs in different patterns depending on what caused the injury. If the cause is not known, the pattern of fibrosis on imaging can define the disease

5 Review questions

1 A heart failure patient is becoming more short of breath. What Xray findings will confirm pulmonary edema?
   1 A lobar consolidation
   2 Upper lobe and central fibrosis
   3 Vascular congestion and Kerley B lines
   4 Multiple pulmonary nodules

2 A former coal miner with chronic severe shortness of breath gets a Chest CT which is read as Pneumoconiosis. What findings does this person likely have on CT?
   1 Lobar consolidations
2 Patchy ground glass
3 A pulmonary nodule
4 Upper lobe and central fibrosis

3 An elderly man who is chronically short of breath has a chest CT which reveals lower lobe fibrosis and calcified pleural plaques. What exposure history should be reviewed?

1 Foreign travel
2 TB infection
3 Coal mining
4 Asbestos exposure
5 Hot tub usage
6 Pesticide exposure

6 Resources for further study

1 Radiology assistant page on ILD patterns
   https://radiologyassistant.nl/chest/lung-hrct-basic-interpretation

2 Fleichner society Glossary of Terms for Thoracic Imaging
   https://pubs.rsna.org/doi/10.1148/radiol.2462070712

3 Any radiology reading room – always feel free to come by and review imaging for your patients.