COMPARISON OF THORACIC IMAGES OF THE MOST COMMON INTERSTITIAL LUNG DISEASES (ILDs)

THERE ARE MORE THAN 200 INDIVIDUAL INTERSTITIAL LUNG DISEASES (ILDS), MOST OF WHICH ARE CLASSIFIED AS RARE AND ARE USUALLY ASSOCIATED WITH CHRONIC PROGRESSION.[1,2]

The most frequently diagnosed ILDs include[3]:	
IPF	CTD-ILDs (e.g. RA-ILD, SSc-ILD)
NSIP	Drug-induced ILD
SARCOIDOSIS	Pneumoconiosis
HP (ALSO EAA)	

SIGNS AND SYMPTOMS OF ILD[4]

Symptoms of ILD generally manifest gradually and are unspecific at first:
Dyspnoea, especially during exertion
Audible crackling on lung auscultation (in fibrotic ILDs)
Cyanosis of the lips or extremities and finger-clubbing (hourglass nails, drumstick fingers) — advanced stage

MAIN PATTERNS IN HRCT[5]	EXAMPLES OF INTERSTITIAL LUNG DISEASES
Reticular	IPF, NSIP Chronic HP or CTD-ILDs
Nodular	Sarcoidosis, subacute HP, RB-ILD
Increased parenchymal density	NSIP (ground glass opacity), COP, drug-induced or CTD-ILDs, DIP, alveolar proteinosis, AIP
Decreased parenchymal density (cystic lesions)	PLCH (chronic), LAM, LIP

ILDs WITH RETICULAR PATTERN

Idiopathic Pulmonary Fibrosis (IPF) with UIP pattern

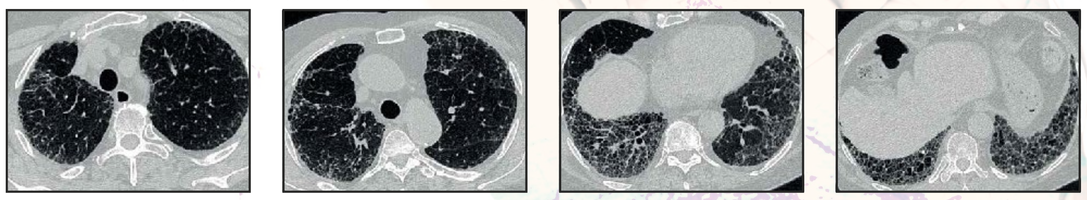
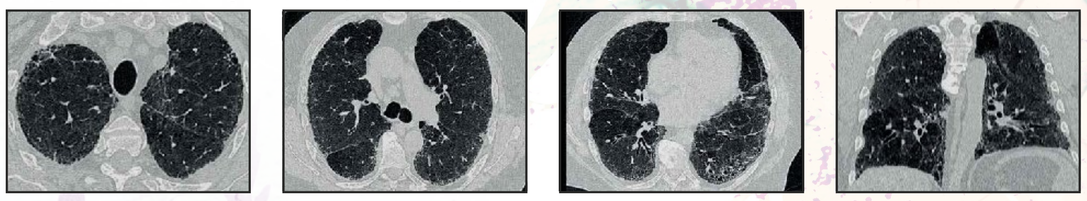


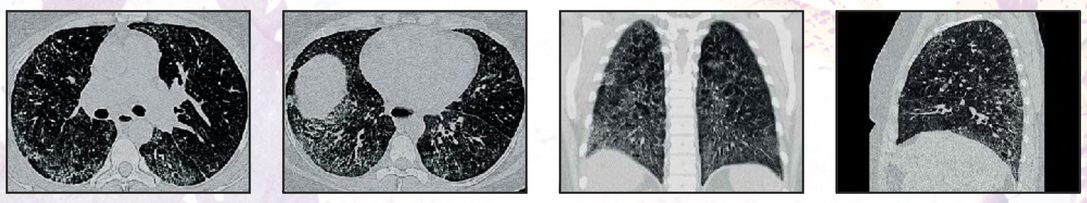
Image of a UIP pattern with marked basal reticular infiltration and a basal honeycomb pattern on both sides. Nest-like reticular infiltration in both UL and typical craniocaudal gradient in a 78-year-old male patient. Clinically marked exertional dyspnoea.

Idiopathic Pulmonary Fibrosis (IPF) with probable UIP pattern



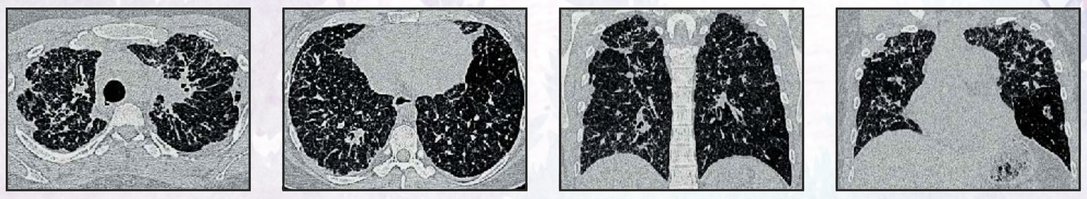
66-year-old male patient. Exertional dyspnoea, audible crackling. Discrete, mainly dorsobasal reticular infiltration on both sides. Ground glass opacity. Nestlike reticular infiltration with focal honeycomb formation in both ventral upper lobes. Evaluated as a probable UIP pattern; UIP pattern confirmed by histology.

Non-specific interstitial pneumonia (NSIP)



48-year-old female patient. Marked ground glass opacity mainly in the basal region, partly sparing of the subpleural space and marked peripheral traction bronchiectasis.

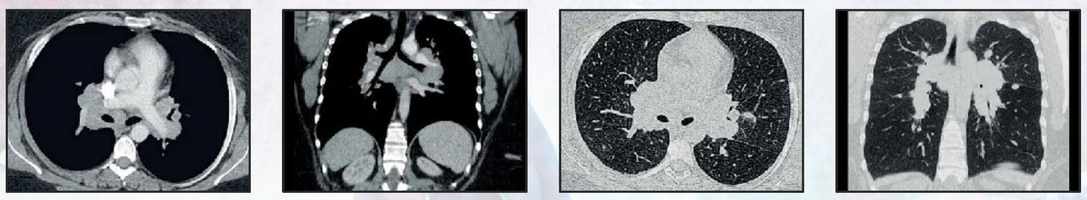
Chronic hypersensitivity pneumonitis (CHP)



31-year-old female patient with CHP diagnosed >5 years ago. Marked peribronchial infiltration, focal mosaic pattern, traction bronchiectasis.

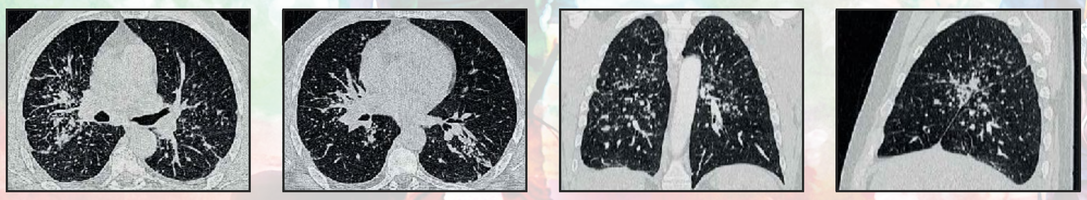
ILDs WITH NODULAR PATTERN

Stage I sarcoidosis (acute manifestation as Löfgren's syndrome)



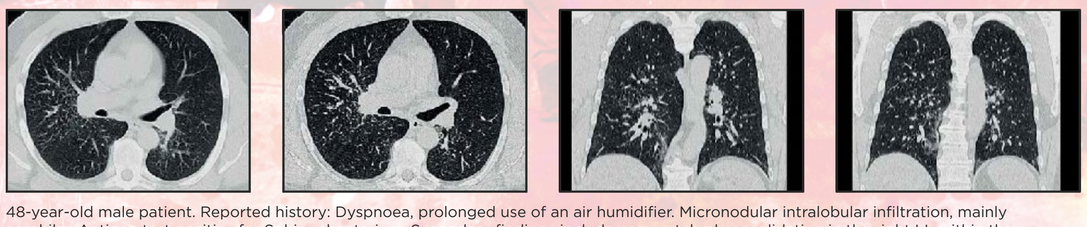
Marked mediastinal and bilateral hilar lymphomas. Individual intrapulmonary LN manifestations in both interlobes in an obese 27-year-old female patient. No interstitial manifestation yet.

Stage III sarcoidosis



Unclear infiltration as an incidental finding on the chest X-ray in a 54-year-old male patient. Marked, paraseptal nodular infiltration with starting conglomerate formation.

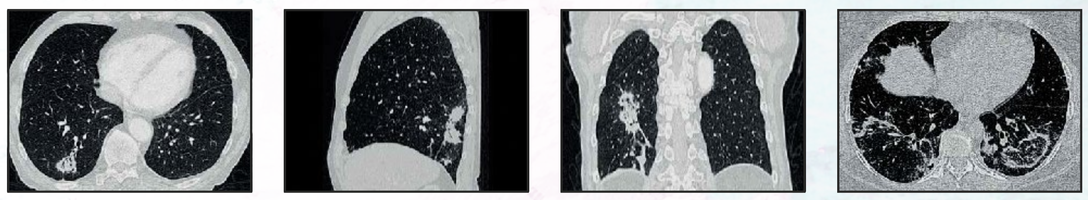
Subacute hypersensitivity pneumonitis (HP)



48-year-old male patient. Reported history: Dyspnoea, prolonged use of an air humidifier. Micronodular intralobular infiltration, mainly parahilar. Antigen test positive for Sphingobacterium. Secondary findings include paravertebral consolidation in the right LL within the scope of spondylosis.

ILDs WITH INCREASED PARENCHYMAL DENSITY

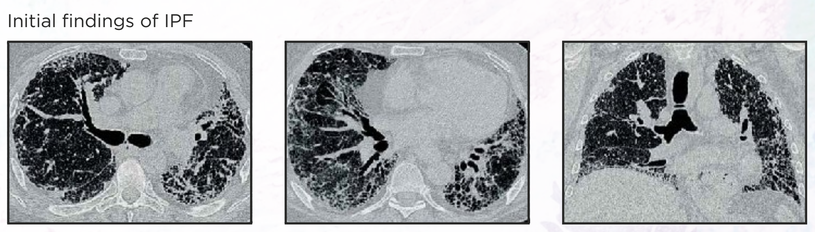
Cryptogenic organising pneumonia (COP)



75-year-old male patient with COP. Previous smoker with focally consolidating infiltration in the right LL. Additionally typical reversed halo sign in a 58-year-old female patient.

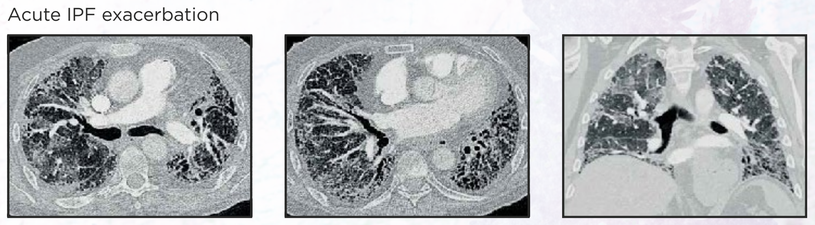
Acute IPF exacerbation

Initial findings of IPF



65-year-old male patient with confirmed IPF. Typical UIP pattern with marked dorsobasal honeycomb pattern, ground glass opacity within the reticular infiltration and traction bronchiectasis.

Acute IPF exacerbation



65-year-old male patient with confirmed IPF. Follow-up CT scan after 10 weeks during hospitalisation due to dyspnoea requiring oxygen. Diffuse ground glass opacity and onset of consolidations as a morphological correlate of the acute exacerbation (examination as a pulmonary angiography CT to rule out pulmonary embolism).

Drug-induced pneumonitis

Acute drug-induced pneumonitis

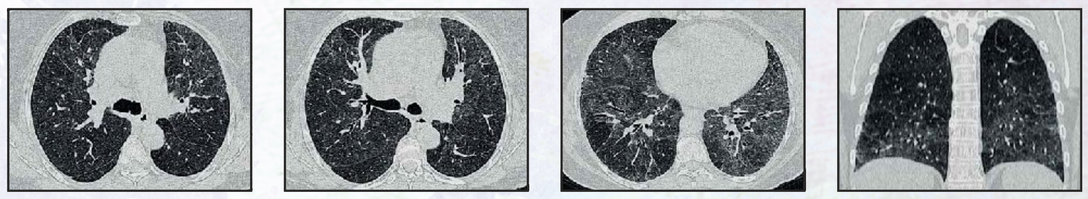
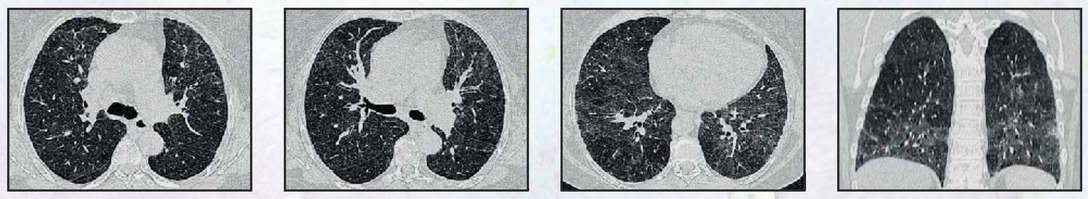


Image of acute pneumonitis as a drug-induced reaction to MTX. Initial CT scan in a 54-year-old female patient. Extensively confluent alveolar infiltration with starting reticular patterns, mainly in the basal region on both sides. Evidence of peripheral traction bronchiectasis as a sign of starting chronic interstitial infiltration.

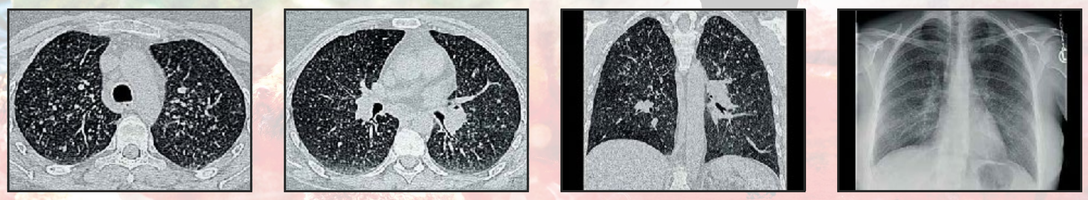
Progression of acute drug-induced pneumonitis



Progression of drug-induced alveolitis under cortisone therapy. Follow-up CT scan after 3 months in a 54-year-old female patient. Regressive, but still visible alveolar infiltration with regressive reticular patterns.

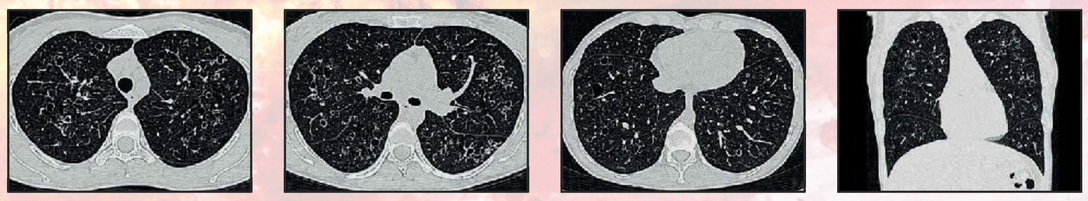
ILDs WITH DECREASED PARENCHYMAL DENSITY

Early-stage PLCH (Pulmonary Langerhans cell histiocytosis)



41-year-old female patient. Extensive micronodular infiltration in the HR scan. Especially in the UL, there are individual cystic lesions visible as a sign of the starting conversion of the focal lesions. X-ray image after 8 months: increasing micronodular and onset of cyst-like findings, particularly in the upper lobes.

Late-stage PLCH



38-year-old female patient. Ubiquitous cystic lesions with irregular wall contours, early signs of destruction of the parenchyma. Only isolated nodular infiltrates visible.

EARLY DIAGNOSIS WITHIN A MULTIDISCIPLINARY TEAM IS ESSENTIAL. ILD SUBTYPE IS RELEVANT FOR PROGNOSIS AND DECISIVE FOR TREATMENT.[6–8]

AIP: Acute interstitial pneumonia. **COP:** Cryptogenic organising pneumonia. **CT:** Computed tomography. **CTD-ILD:** Connective tissue disease-associated interstitial lung disease. **DIP:** Desquamative interstitial pneumonia. **HP:** Hypersensitivity pneumonitis (= EAA: Exogenic allergic alveolitis). **ILD:** Interstitial lung disease. **IPF:** Idiopathic pulmonary fibrosis. **LAM:** Lymphangioleiomyomatosis. **LIP:** Lymphocytic interstitial pneumonia. **LL:** Lower lobe. **LN:** Lymph nodes. **MTX:** Methotrexate. **NSIP:** Non-specific interstitial pneumonia. **PLCH:** Pulmonary Langerhans cell histiocytosis. **RA-ILD:** Rheumatoid arthritis-associated interstitial lung disease. **RB-ILD:** Respiratory bronchiolitis-associated interstitial lung disease. **SSc-ILD:** Systemic sclerosis-associated interstitial lung disease. **UIP:** Usual interstitial pneumonia. **UL:** Upper lobe.

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References: 1. Flaherty KR, et al. BMJ Open Resp Res 2017;4:e000212. **2.** Cottin V, et al. Eur Respir Rev 2018;27:180076. **3.** Dhooria S, et al. PLoS One 2018;13:e0191938. **4.** European Lung Foundation: Interstitial lung diseases. https://www.europeanlung.org/en/lung-disease-and-information/lung-diseases/interstitial-lung-disease. Accessed July 2019. **5.** Schaefer-Prokop C. Radiologe 2014;54:1170–1179. **6.** Behr J, et al. Pneumologie 2018;72:155–168. **7.** Raghu G, et al. AmJ Respir Crit Care Med 2015;192:e3–e19. **8.** Wells A, et al. Curr Opin Pulm Med 2014;20:442–448.

Images courtesy of Dr. Hilmar Kühl, Kamp-Lintfort, Germany.

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