Interstitial Lung Disease: An Overview

Justin Oldham, MD MS
Assistant Professor of Medicine
Director, Interstitial Lung Disease Program
University of California at Davis
Sacramento VA Medical Center

UCDAVIS
UNIVERSITY OF CALIFORNIA

Disclosures

- Grants to study Genomic Predictors of IPF Outcomes (NIH) and protein markers of non-IPF ILD outcomes (ACCP)

- Grant to study early ILD detection
  - UC-Davis Gordon Wong endowment

- IPF Consulting/Speaking
  - Genentech
  - Boehringer Ingelheim

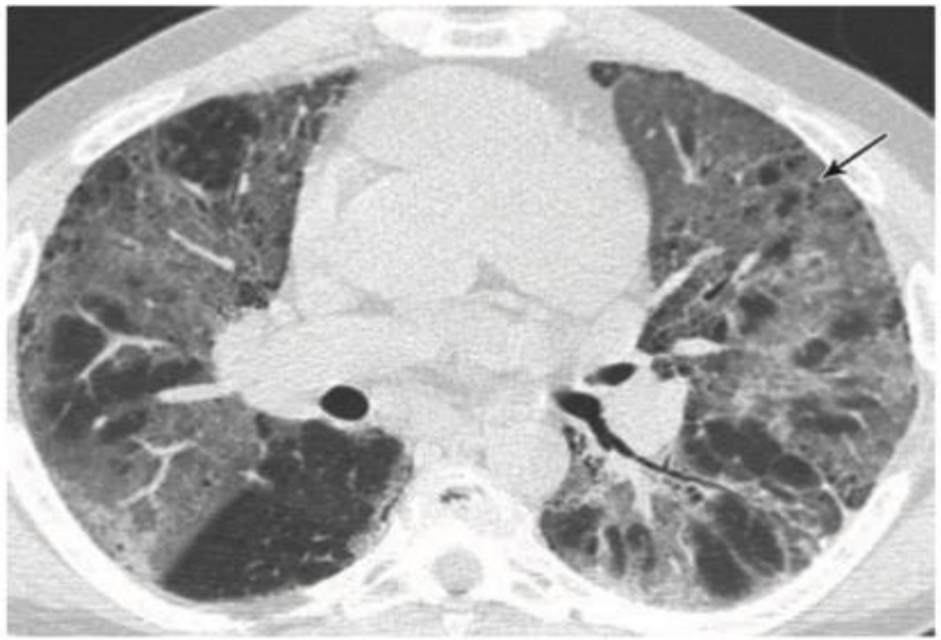
Objectives

- Provide a framework for how the interstitial lung diseases (ILD) are organized

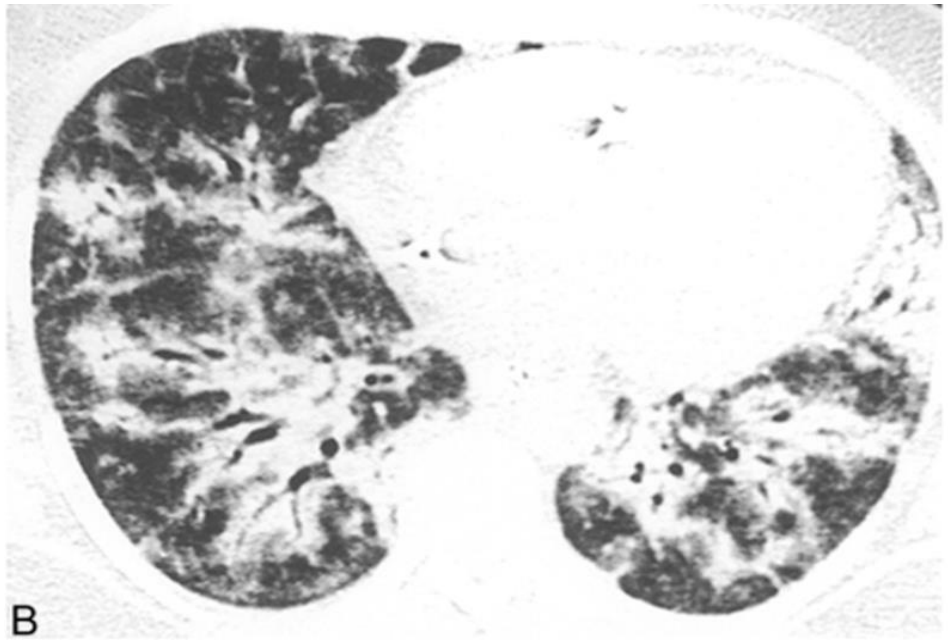
- Review the key components of the ILD evaluation

What is interstitial lung disease?

Inflammatory ILDs



Non-specific Interstitial Pneumonia



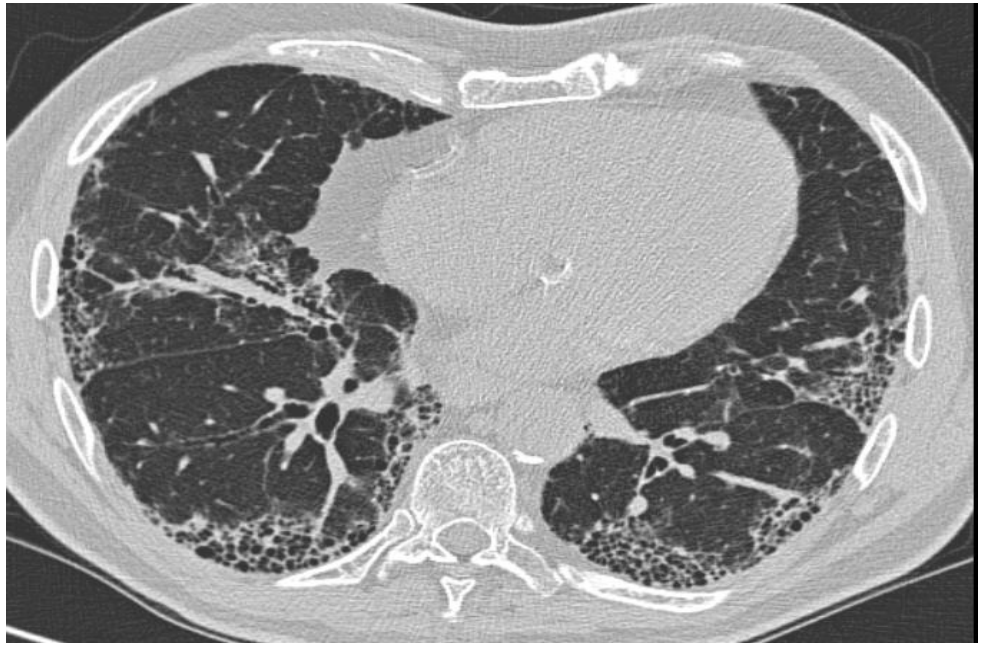
Organizing Pneumonia

Common in autoimmune ILD

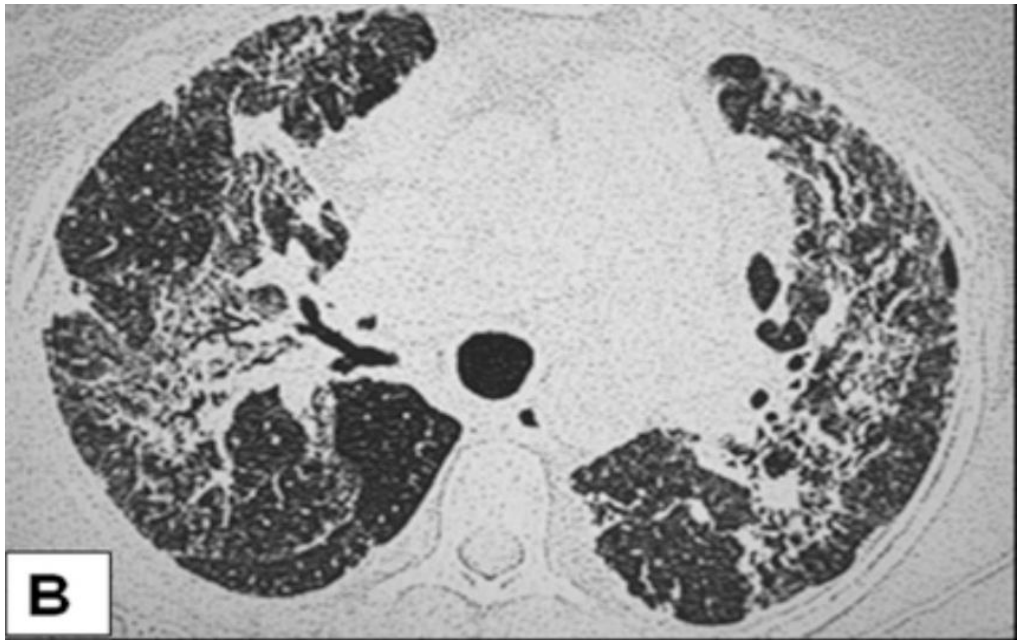
UCDAVIS

Kligerman et al.Radiographics 2009
Travis et al. AJRCCM 2013

Fibrotic ILDs



Peripheral fibrosis
(common in idiopathic pulmonary fibrosis)

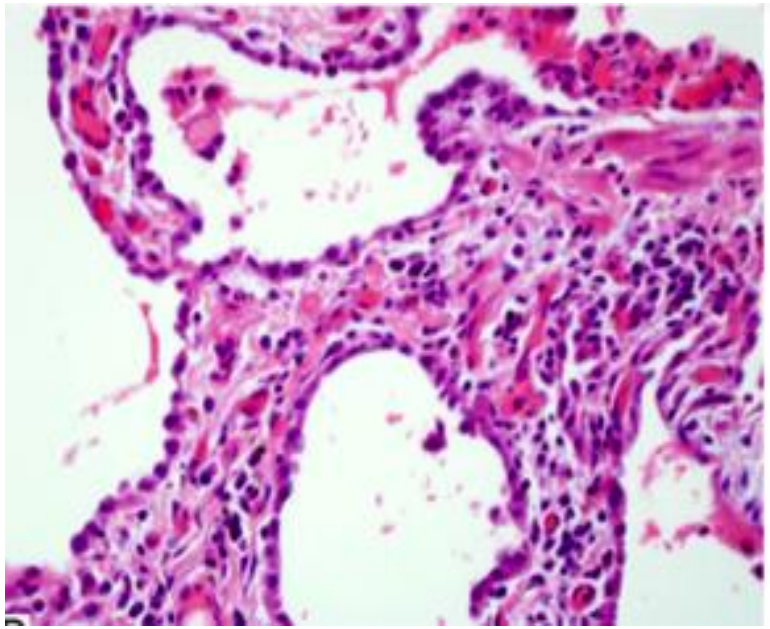


Central fibrosis
(common in chronic hypersensitivity pneumonitis)

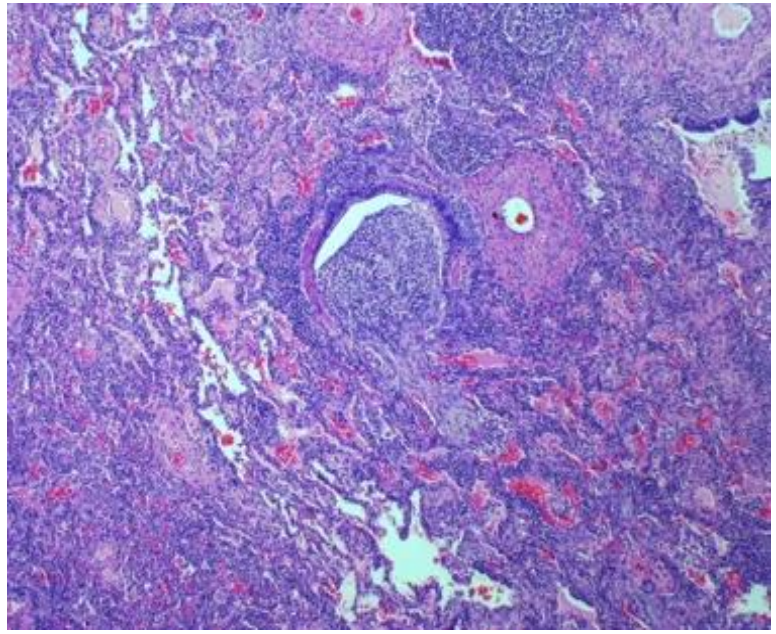
UCDAVIS

Oldham et al. Res Med 2014
Selman et al. AJRCCM 2012

Inflammatory ILDs



Cellular non-specific Interstitial Pneumonia



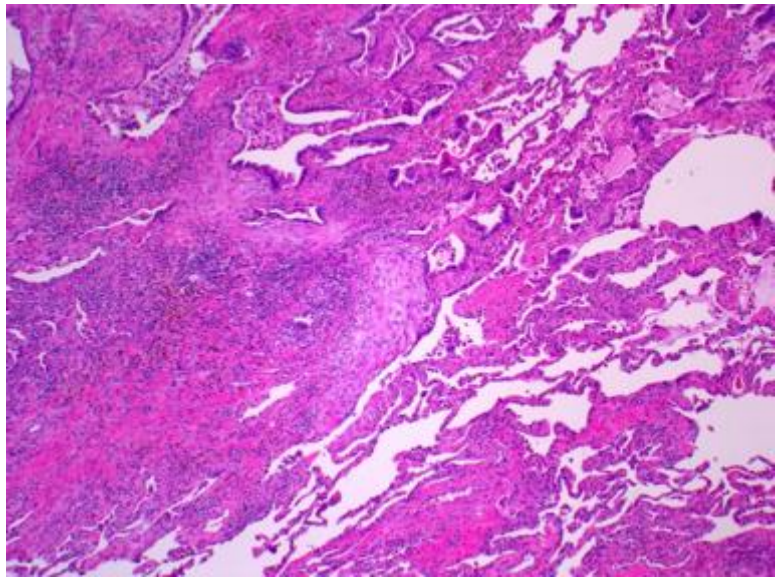
Organizing Pneumonia

Usually indicates autoimmune ILD

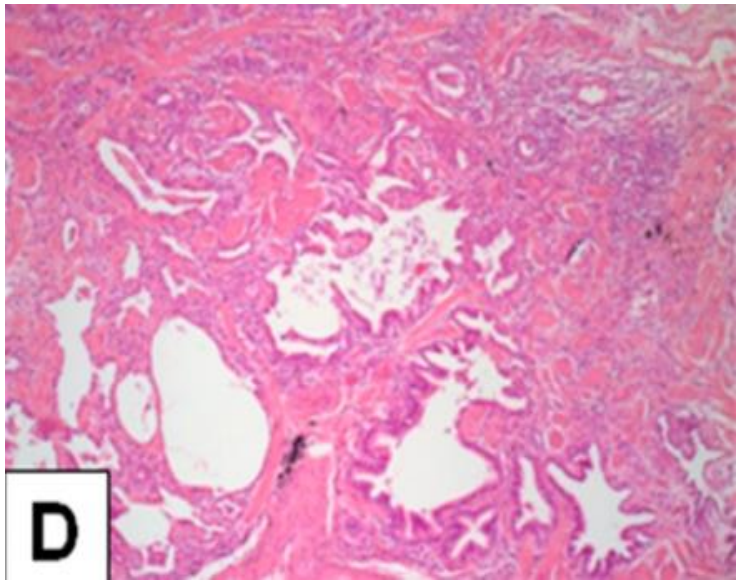
UCDAVIS

Travis et al. AJRCCM 2013

Fibrotic ILDs



Usual Interstitial Pneumonia
(usually indicates IPF)

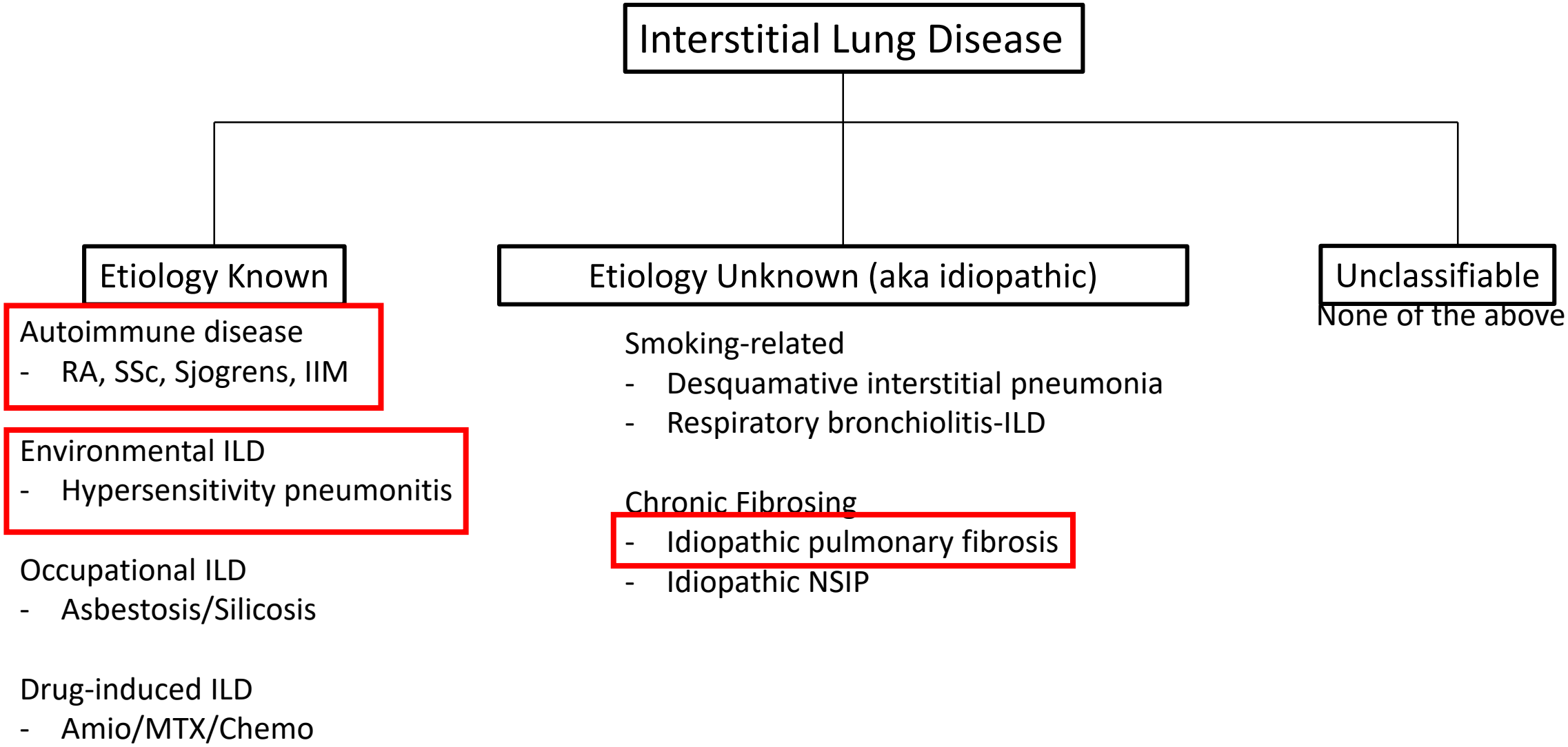


Airway-centric fibrosis
(usually indicates chronic hypersensitivity pneumonitis

UCDAVIS

Oldham et al. Res Med 2014
Selman et al. AJRCCM 2012

What types of ILD we see on a regular basis



Interstitial Lung Disease

<u>Inflammatory Predominant ILDs</u>
Autoimmune ILD (most)
Hypersensitivity Pneumonitis (early)
Cryptogenic Organizing Pneumonia
Drug-induced ILD

<u>Fibrotic Predominant ILDs</u>
UIP due to Scleroderma or RA
Hypersensitivity pneumonitis (late)
Idiopathic pulmonary fibrosis
Asbestosis

The ILD Evaluation

Goals

- Standardized work-up to improve diagnostic accuracy
- Avoid unnecessary lung biopsy
- Diagnose early in the disease course
- Treat the disease early to improve outcomes

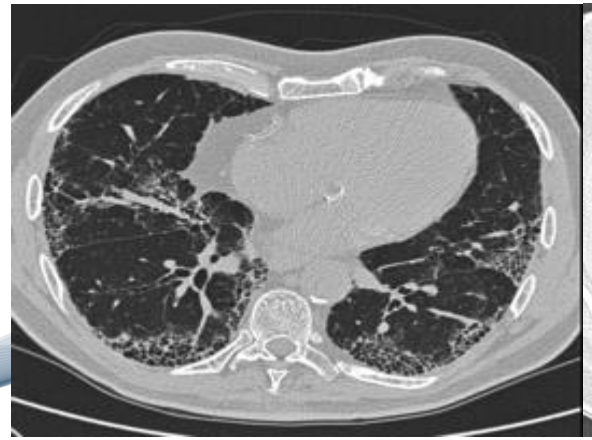
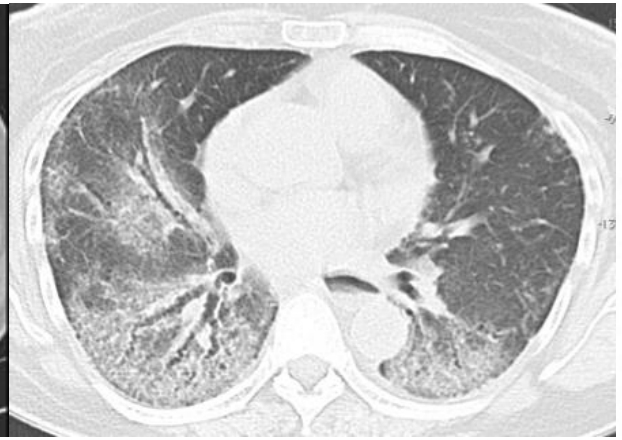
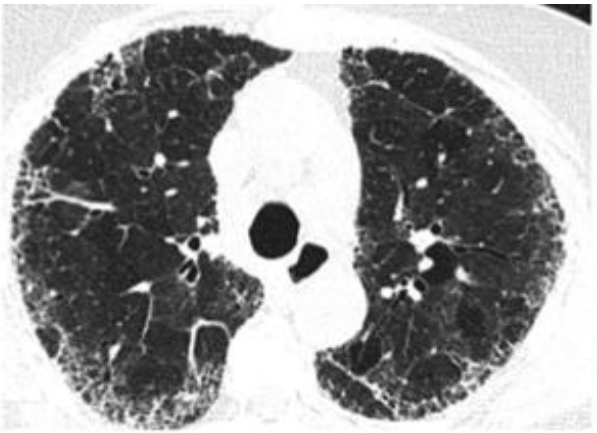
The ILD Evaluation

Laboratory work-up
- Autoimmune serologies

Physical Exam
- Autoimmune features?
- Crackles? Location?

High-resolution CT Scan

History
- Environmental history (Birds, mold)? - HP
- Joint pain/swelling, rash, muscle weakness, skin tightening, dysphagia? - CTD-ILD
- New medication? - Chemo/Amio/MTX
- Job exposures? - asbestosis, silicosis
- Family history of ILD? – familial IPF
- Smoking history? – smoking-ILDs
- Early graying, bone marrow abnormality, liver disease? – short telomere-related ILD

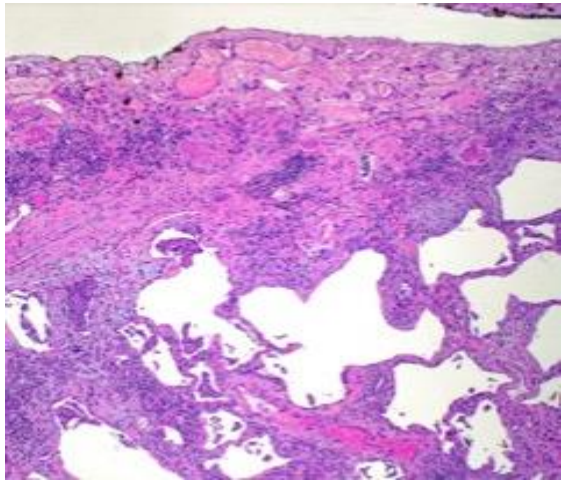




UCDAVIS

The ILD Evaluation

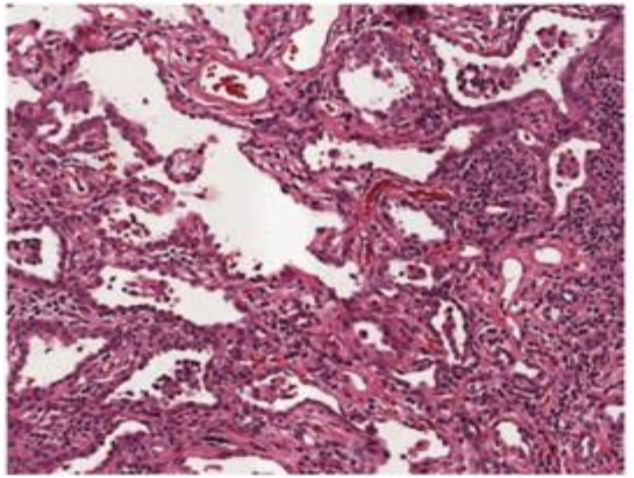
History unrevealing
Physical exam non-specific
Laboratory work-up negative
Chest CT scan non-diagnostic

Unclassifiable ILD



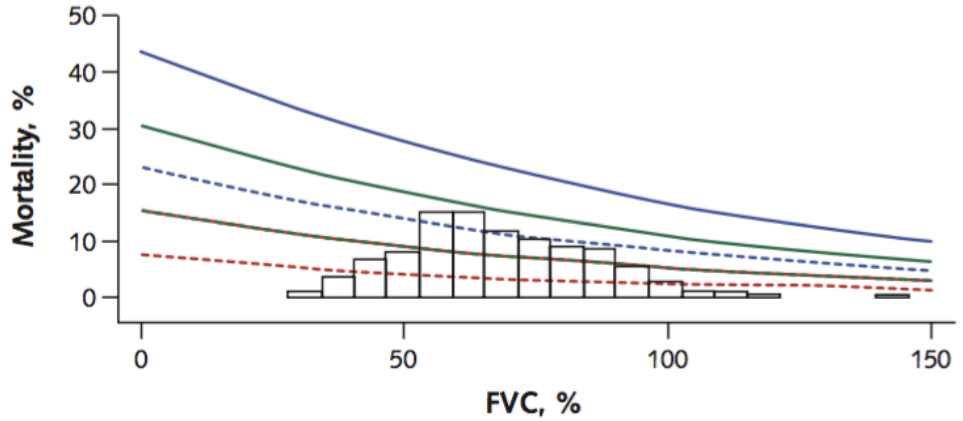
Surgical Lung Biopsy

- **Must have sufficient lung function**
- **Largely safe, but small and finite risk of death and exacerbation**

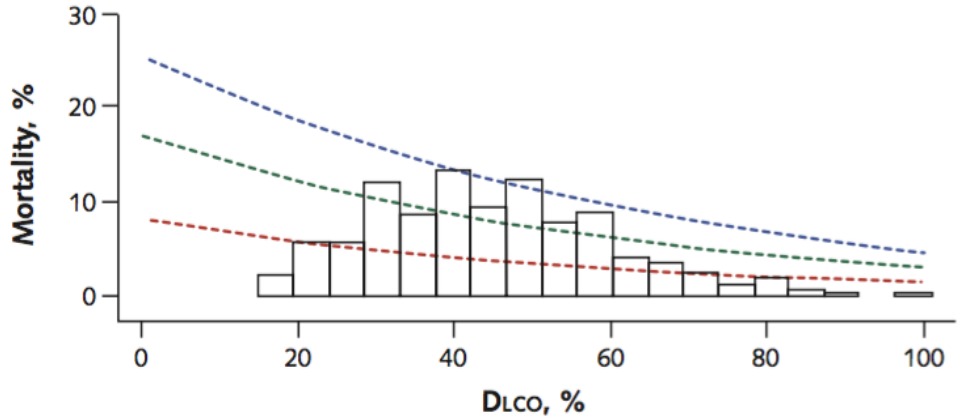


The ILD Evaluation - PFT

- Helps characterize physiology
  - Forced vital capacity (FVC)
  - Diffusion capacity (DLCO)



- Can assist with prognostication
  - Baseline values
  - Longitudinal change over time



UCDAVIS

Ley et al. Ann Int Med 2012

The ILD Evaluation - Bronchoscopy

- Generally of limited use with a few notable exceptions
  - Hypersensitivity pneumonitis – cellular analysis
  - Asbestosis – cellular analysis, biopsy
  - Drug toxicity – cellular analysis, biopsy

- Potential emerging utility in bronchoscopic biopsy to diagnose IPF

The ILD Evaluation – Multi-disciplinary Discussion

Multidisciplinary Approach

The process of achieving a multidisciplinary diagnosis in a patient with IIP is dynamic, requiring close communication between clinician, radiologist, and when appropriate, pathologist (1). Clinical data (presentation, exposures, smoking status, associated diseases, lung function, laboratory findings) and radiologic findings are essential for multidisciplinary diagnosis.

MDD

Pulmonologist

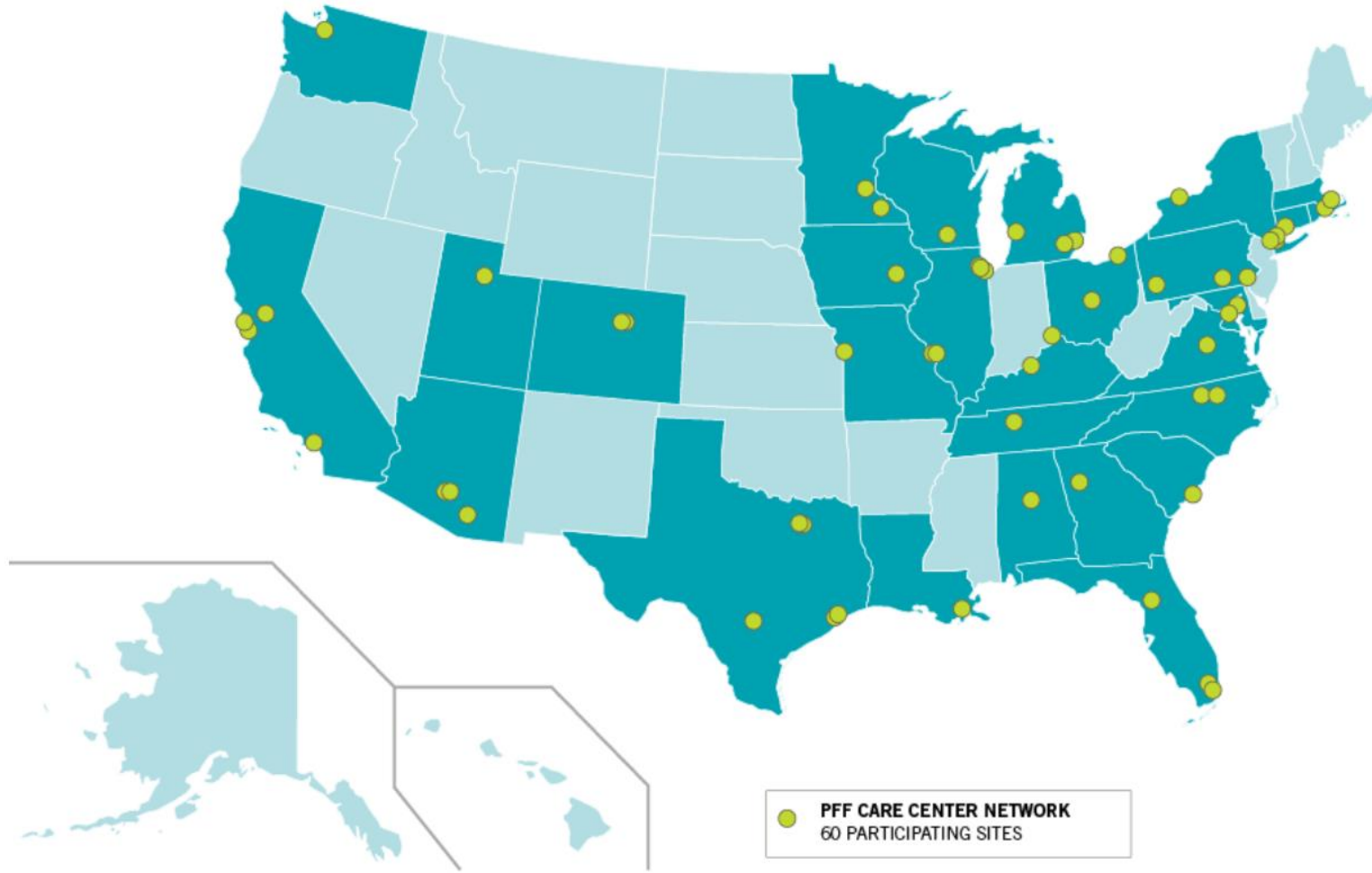
Chest Radiologist

Pulmonary pathologist

Consider ILD center referral for all patients with ILD

UCDAVIS

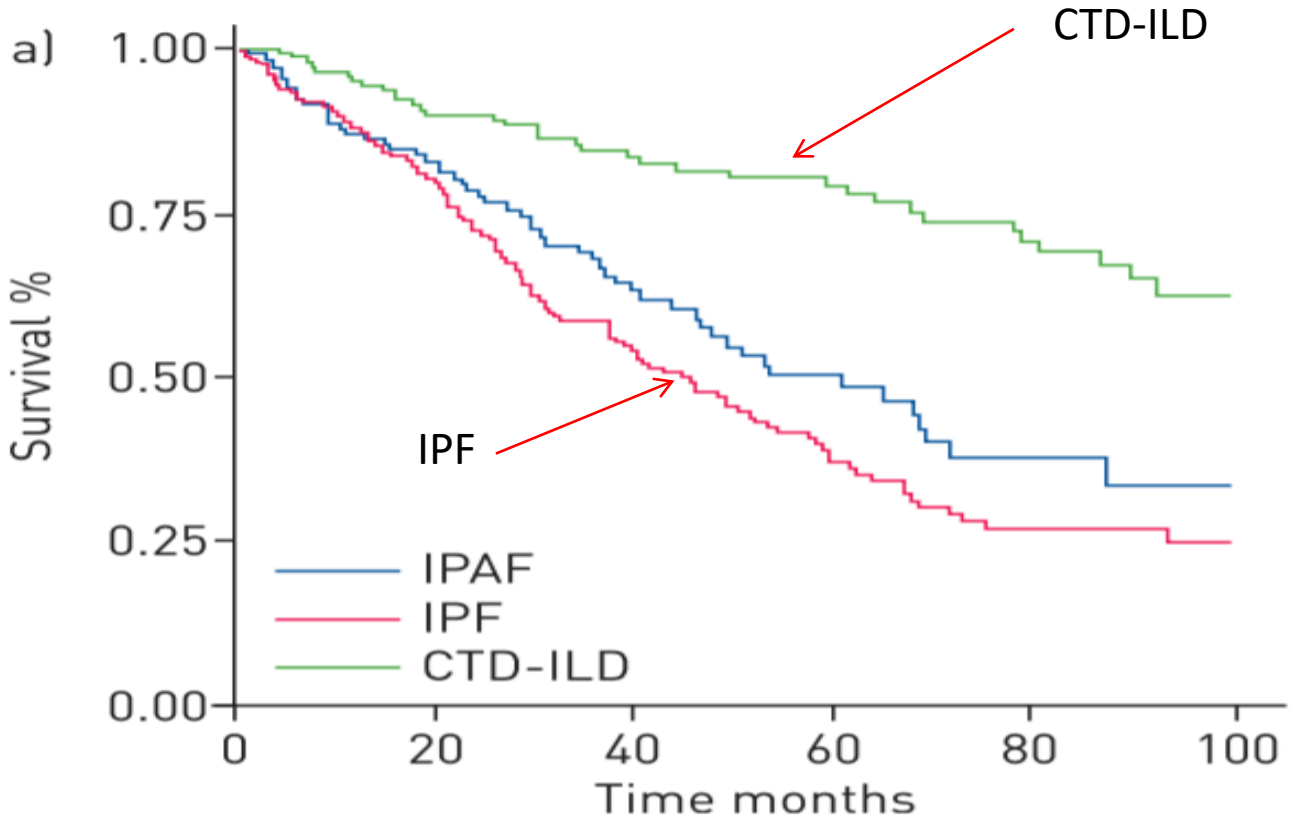
Travis et al. AJRCCM 2013


PFF CARE CENTER NETWORK
60 PARTICIPATING SITES

The ILD Center Experience

- Standardized evaluation
- Multi-disciplinary discussion
- Co-morbidity assessment and treatment
- Pulmonary rehabilitation referral
- Assessment for supplemental oxygen needs
- ILD support group
- ILD therapeutics
- Clinical trials

An accurate diagnosis is critical



>50% of patients diagnosed with autoimmune ILD will live >10 years

<50% of patients diagnosed with IPF will live >5 years

UCDAVIS

Oldham et al. ERJ 2016

Appropriate ILD Therapy is Critical

Azathioprine response in patients with fibrotic connective tissue disease-associated interstitial lung disease

Justin M. Oldham [a, *], Cathryn Lee [b], Eleanor Valenzi [e], Leah J. Witt [c], Ayodeji Adegunsoye [c], Scully Hsu [c], Lena Chen [c], Steven Montner [d], Jonathan H. Chung [d], Imre Noth [c], Rekha Vij [c], Mary E. Strek [c]

[a] Department of Medicine, Division of Pulmonary, Critical Care and Sleep Medicine, The University of California at Davis, United States
[b] Department of Medicine, The University of Chicago, United States
[c] Department of Medicine, Section of Pulmonary and Critical Care Medicine, The University of Chicago, United States
[d] Department of Radiology, The University of Chicago, United States
[e] Department of Medicine, Division of Pulmonary, Allergy and Critical Care Medicine, The University of Pittsburgh, United States

autoimmune-ILD: steroids and immunosuppressive therapy probably helpful

J.M. Oldham et al. / Respiratory Medicine 121 (2016) 117–122

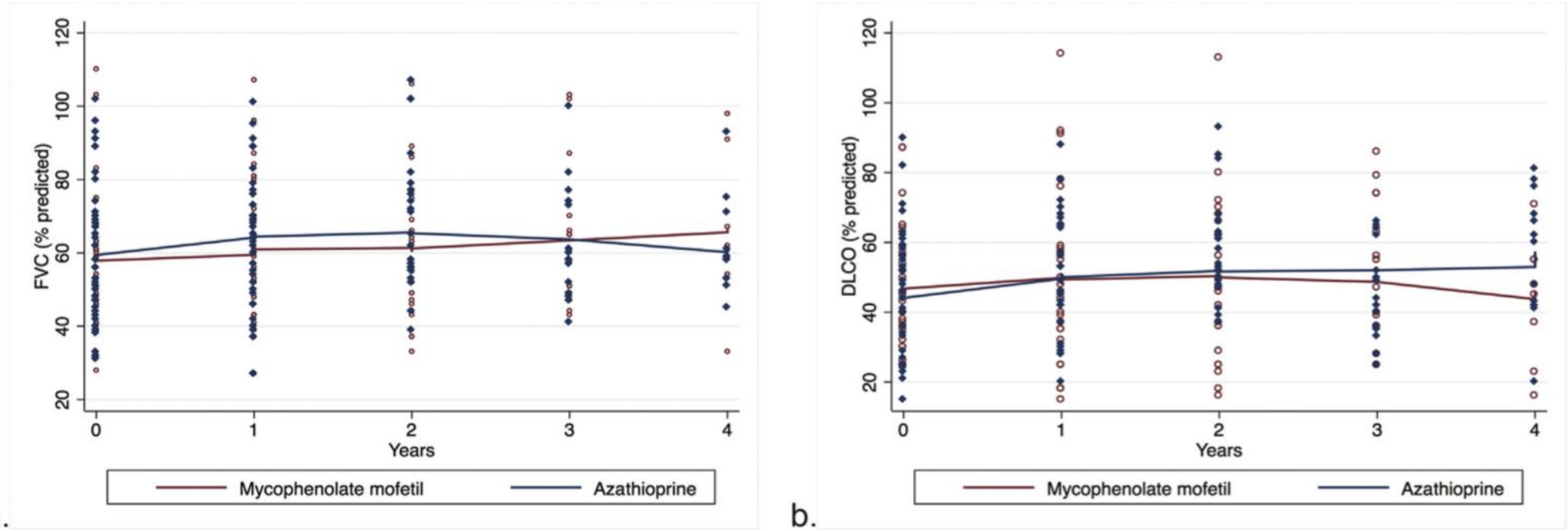


Fig. 2. Longitudinal change in percent predicted FVC (a) and DLCO (b) in a cohort of patients with fibrotic CTD-associated ILD treated with azathioprine and mycophenolate mofetil.

UCDAVIS

Oldham et al. Res Med 2016

Use of Mycophenolate Mofetil or Azathioprine for the Management of Chronic Hypersensitivity Pneumonitis

Julie Morisset, MD; Kerri A. Johannson, MD; Eric Vittinghoff, PhD; Carlos Aravena, MD; Brett M. Elicker, MD; Kirk D. Jones, MD; Charlene D. Fell, MD; Helene Manganas, MD; Bruno-Pierre Dubé, MD; Paul J. Wolters, MD; Harold R. Collard, MD, FCCP; Christopher J. Ryerson, MD; and Brett Ley, MD

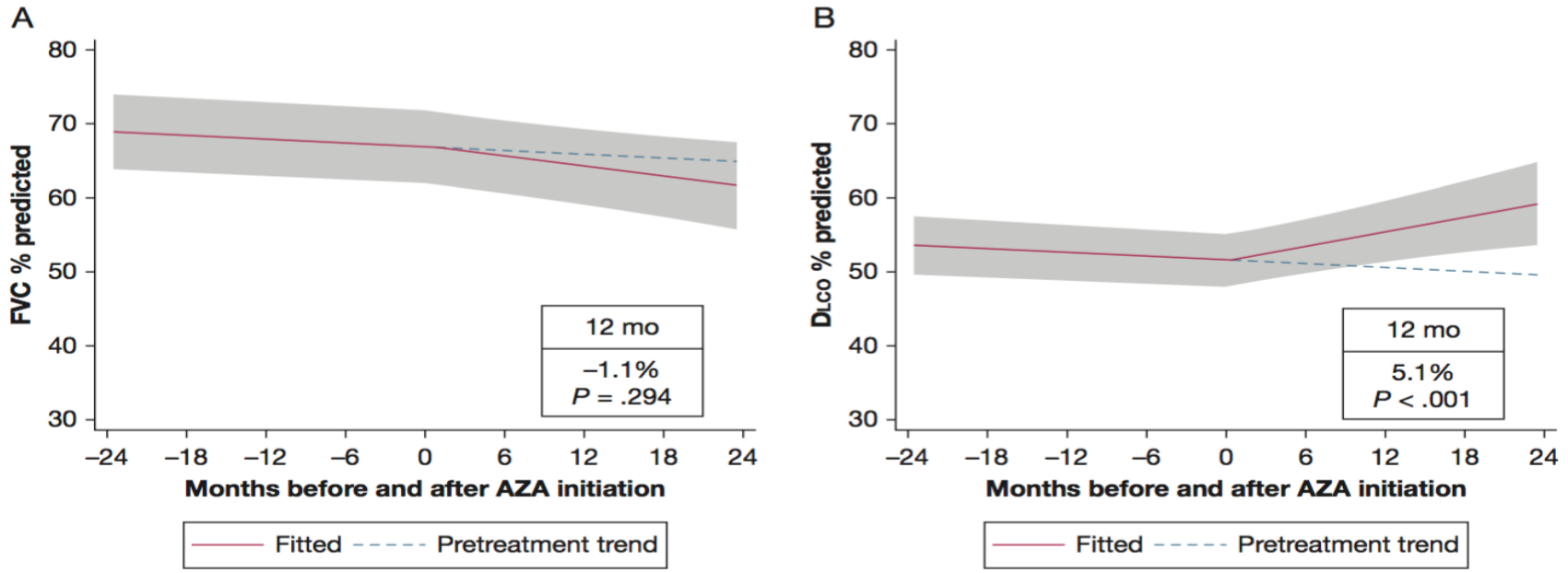


Figure 4 – *Mixed-effects model estimates for FVC % predicted and DLCO % predicted before and after initiation of azathioprine. The gray shading indicates the 95% CI. See Figure 1 and 2 legends for expansion of abbreviations.*

Environmental ILD: steroids and immunosuppressive therapy probably helpful

UCDAVIS

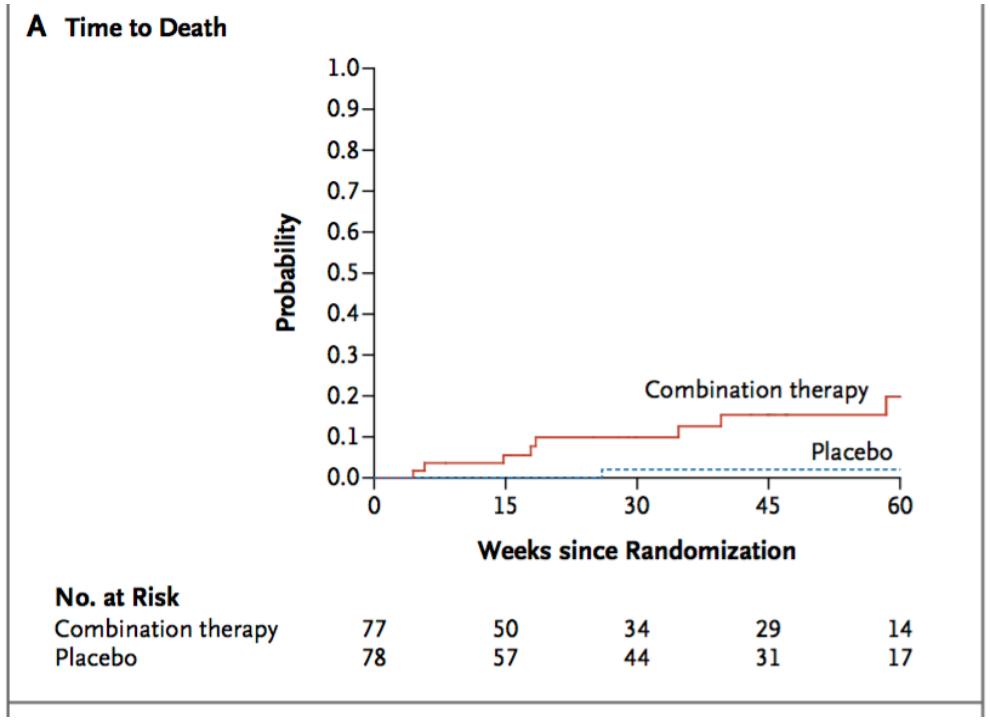
Morisset et al. Chest 2017

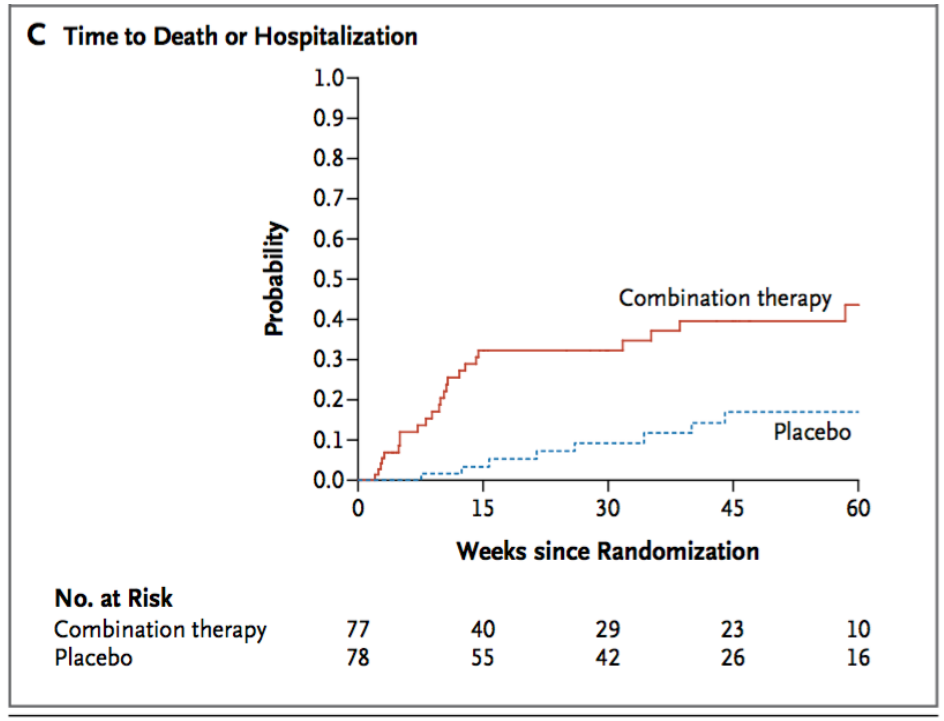
ORIGINAL ARTICLE

IPF: steroids and immunosuppressive therapy harmful

Prednisone, Azathioprine, and *N*-Acetylcysteine for Pulmonary Fibrosis

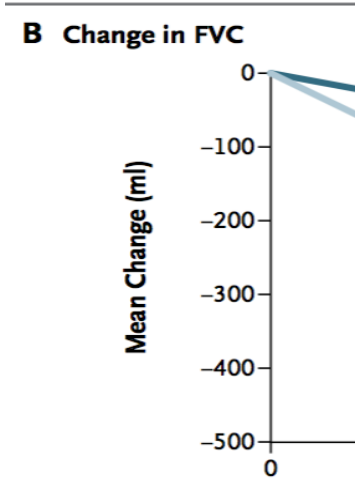
The Idiopathic Pulmonary Fibrosis Clinical Research Network*





UCDAVIS

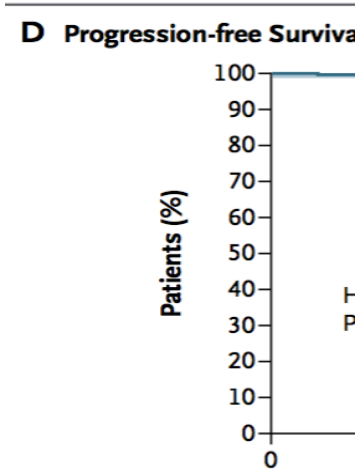
Raghu et al. NEJM 2012



ORIGINAL ARTI

A Phase 3 Trial of Pirfeni with Idiopathic Pulmo

Talmadge E. King, Jr., M.D., Williamson
Socorro Castro-Bernardini, M.D., Eliza
Ian Glaspole, M.B., B.S., Ph.D., Marilyn K. Glasst
Peter M. Hopkins, M.D., David Kardatzke
David J. Lederer, M.D., Steven D. Nathan, M
Steven A. Sahn, M.D., Robert Sussman, M
and Paul W. Noble, M.



No. at Risk

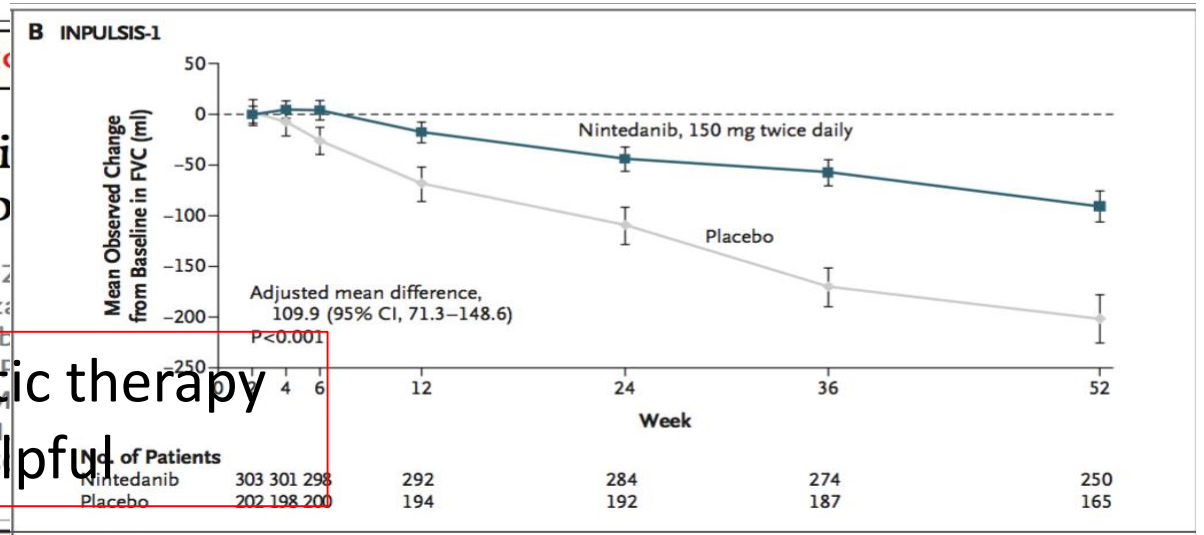
Pirfenidone	276					
Placebo	273	262	225	192	113	

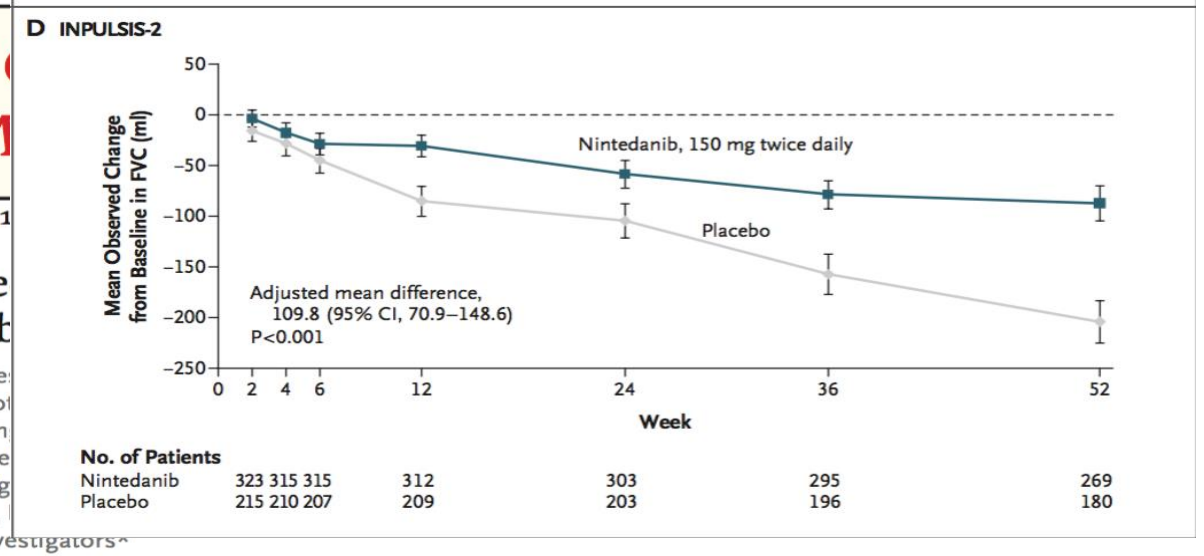
The NEW EN
JOURNAL of M
ESTABLISHED IN 1812 MAY 29, 201

Efficacy and Safety of Ninte Pulmonary Fib

Luca Richeldi, M.D., Ph.D., Roland M. du Bois, M.D., Gane
Kevin K. Brown, M.D., Ulrich Costabel, M.D., Vincent Co
David M. Hansell, M.D., Yoshikazu Inoue, M.D., Ph.D., Don
Andrew G. Nicholson, D.M., Paul W. Noble, M.D., Moisés Se
Michèle Brun, M.Sc., Florence Le Maulf, M.Sc., Mannaïg
Rozsa Schlenker-Herceg, M.D., Bernd Disse, M.D.,
for the INPULSIS Trial Investigators*

IPF: anti-fibrotic therapy likely helpful





UCDAVIS

Summary

- ILD subtypes progress at highly variable rates
- You will help some ILD subtypes by prescribing steroids/immunosuppression
- You will hurt some ILD subtypes by prescribing steroids/immunosuppression
- An early and accurate diagnosis is critical

Thank You!

UCDAVIS