

ILD comorbidities

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September 29, 2020

Comorbidities

- Comorbidity: Other diseases that accompanies the disease of interest
 - High blood pressure and heart disease
 - Obesity and diabetes
- *Morbus* = “disease”, *morbidus* = diseased
- May be caused by or contribute to disease

Co-morbidities of ILD

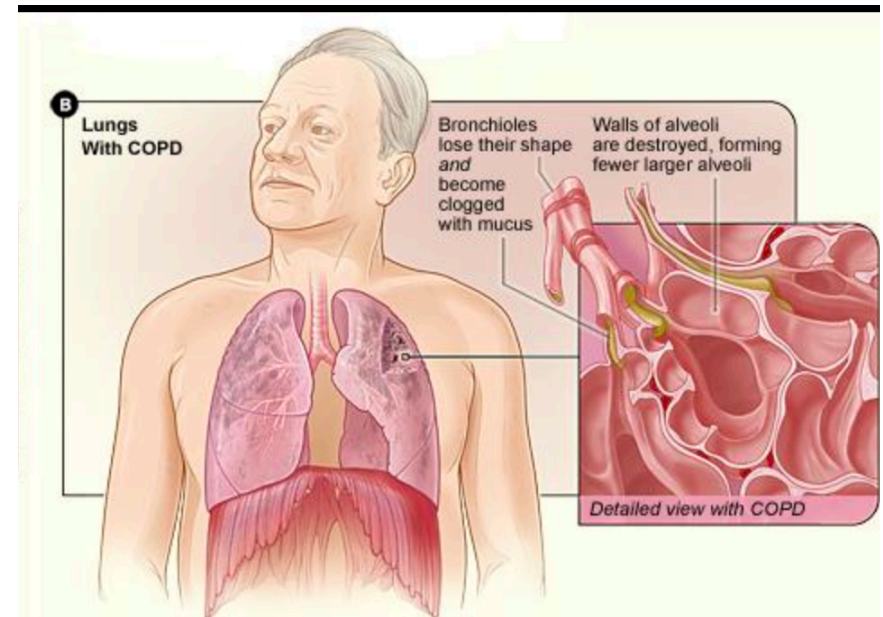
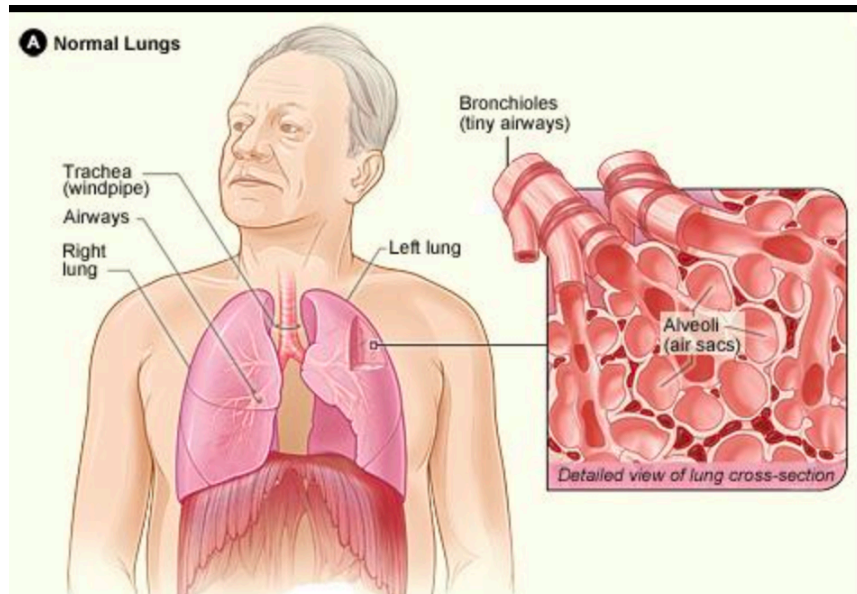
Emphysema

Sleep apnea

Pulmonary hypertension

Gastro-esophageal reflux

What is emphysema?



Why is it associated with ILD?

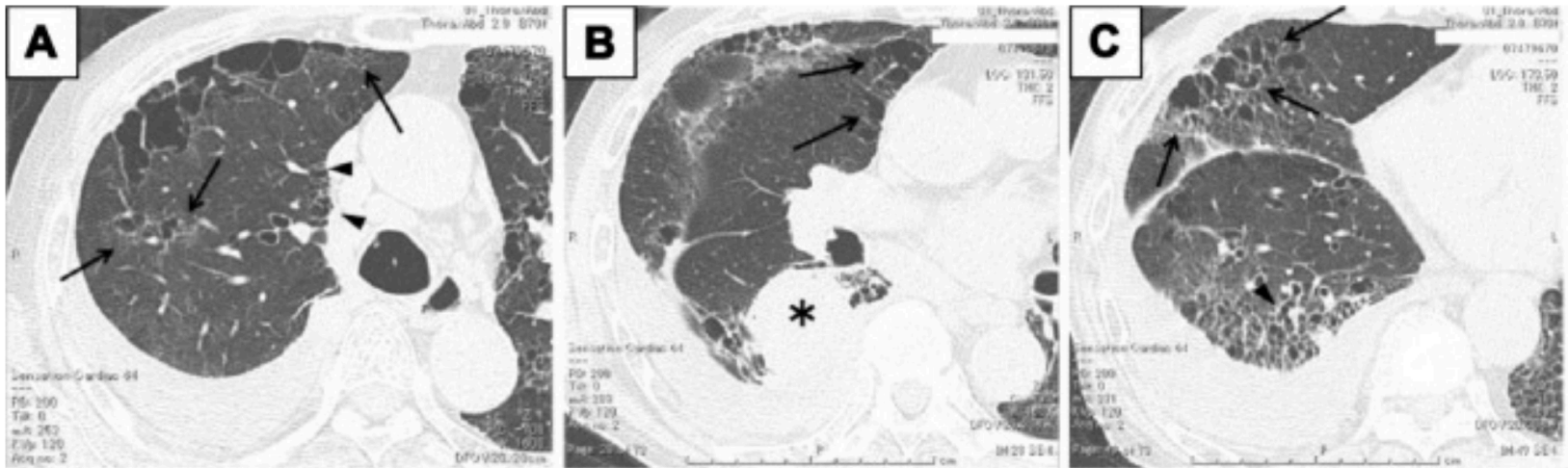
- Seen in up to 30% of IPF patients
- More common in smokers, as is some ILD
- CT scans and PFTs done for one disease allow us to diagnose the other

Why do we care?

- Combined pulmonary fibrosis and emphysema might be a different kind of pulmonary fibrosis
- Patients with both have even more trouble getting oxygen
- More likely to have pulmonary hypertension
- Not clear same treatments work (probably do!)

How do we find it?

- CT scan with emphysema
- PFTs with obstruction as well as restriction, extra low DLCO



[Int J Chron Obstruct Pulmon Dis. 2015; 10: 1299–1303.](#)

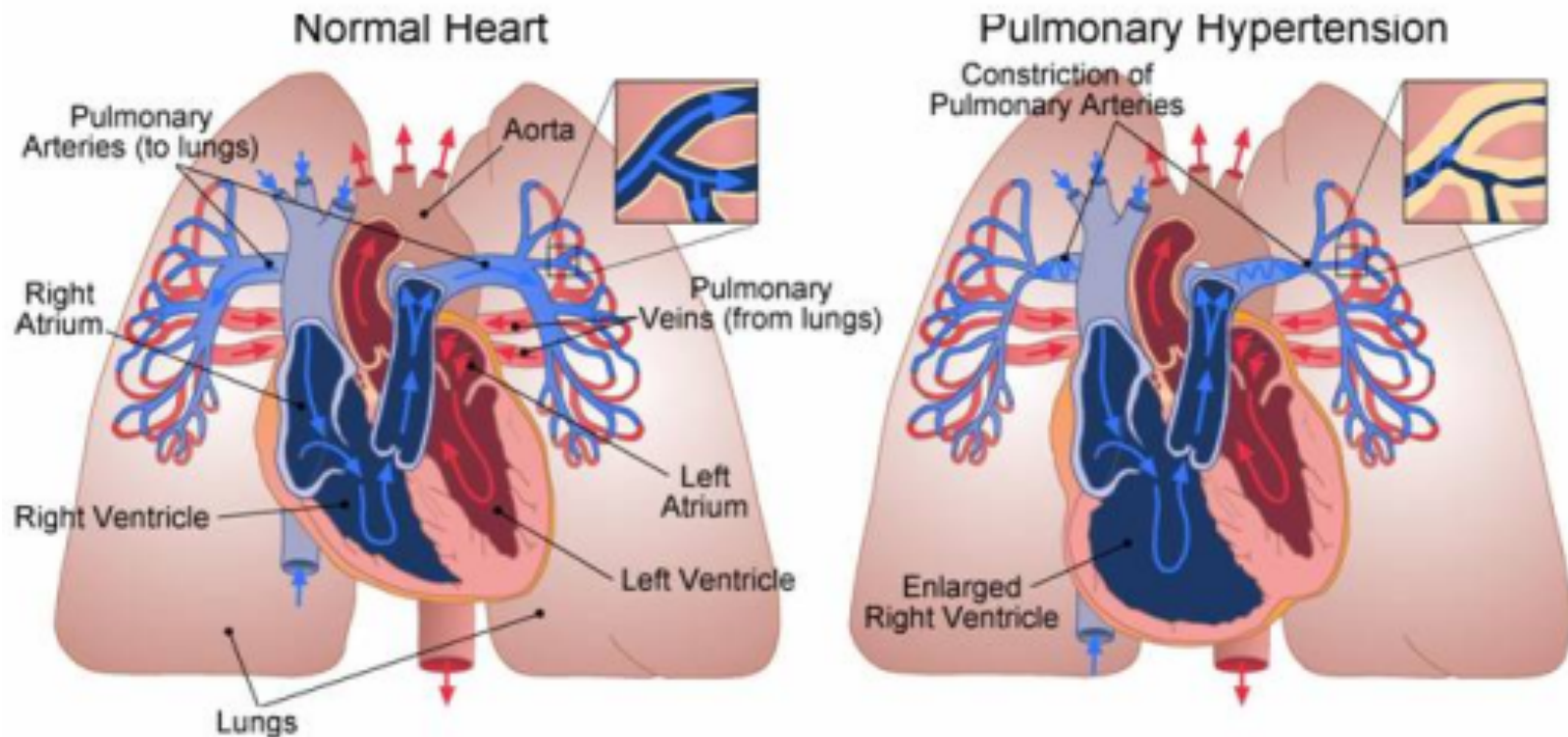
Caminati et al. Eur Respir Rev 2019 Oct 1;28(153):

How do we treat it?

- Newly appreciated
- Probably ILD drives clinical course so treatment based on that
- Now included in “progressive fibrosis” - eligible for nintedanib

What is pulmonary hypertension?

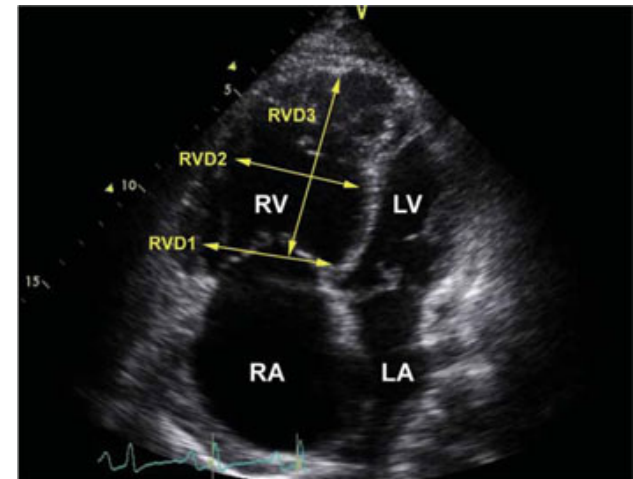
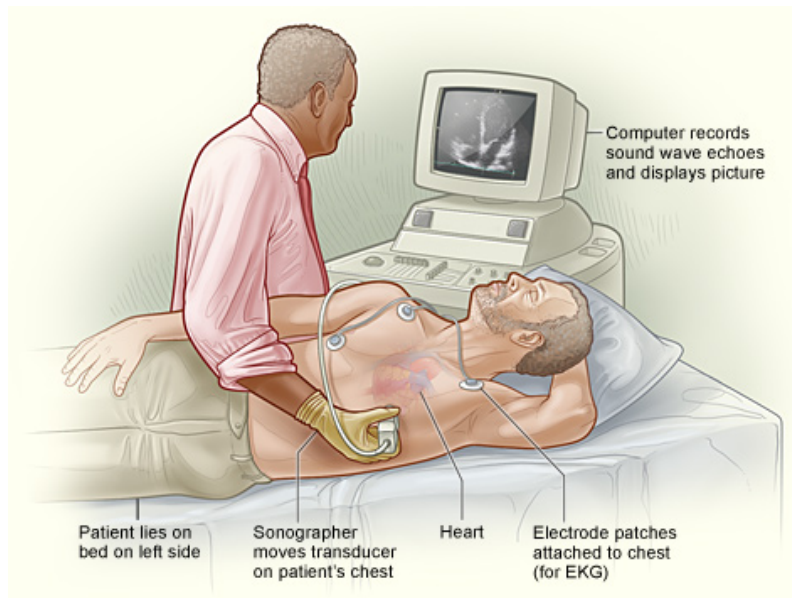
High pressure in the blood vessels of the lungs



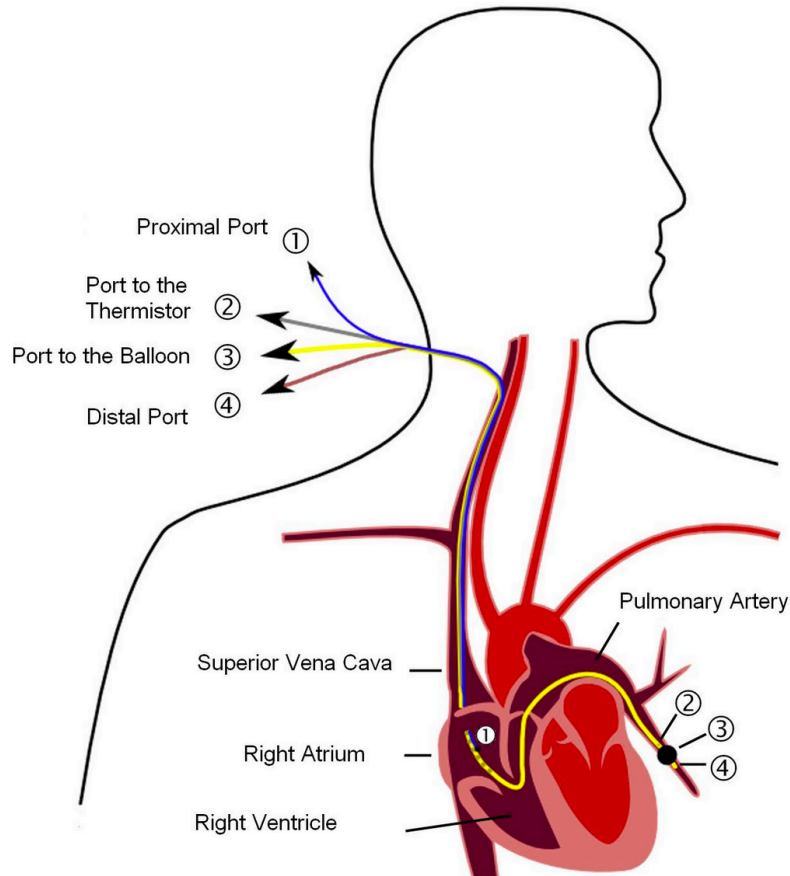
Why is it associated with ILD?

- Estimates 10-50% in IPF
- Maybe be related to low oxygen levels tightening walls of blood vessels
- Blood vessels could be destroyed by scar
- Some diseases directly cause both pulmonary fibrosis and pulmonary hypertension

How do we find it? Echocardiogram



How do we find it? Right heart catheterization



How do we treat it?

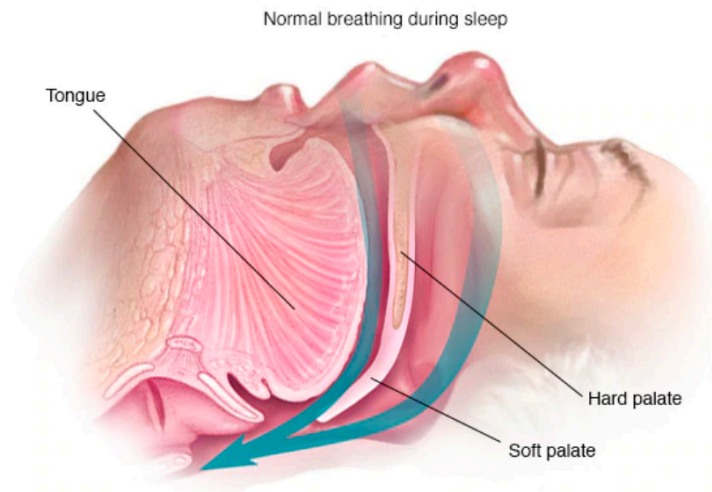
- Keep oxygen above 90%
- Treat sleep apnea
- Medication may help severe PH
 - Case by case
 - Some medications may help
 - tested for fibrosis, no effect (bosentan, sildenafil)
 - Ambrisentin may worsen fibrosis

What is sleep apnea?

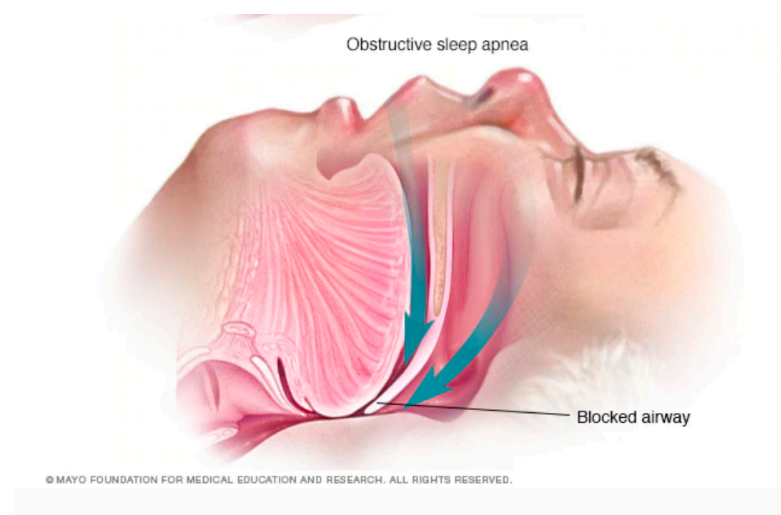
- Breathing interruption when asleep
- Can be from not trying to breathe (“central”) or not being able to breathe (“obstructive”)

What is obstructive sleep apnea?

Normal



Obstructive



Relaxation of muscles during sleep blocks the airway-> no breath-> low oxygen->waking up->daytime sleepiness

Why is it associated with ILD?

- US Adults in ~ 30% men, 17% women have some OSA 30
- Estimates in IPF range from 6-91%
- Vanderbilt IPF clinic : 88% of patients had some obstructive sleep apnea
- Smaller lung volumes may let airway collapse
 - Vanderbilt study no clear correlation with smaller lungs->worse OSA
- GERD associated with OSA might cause more ILD

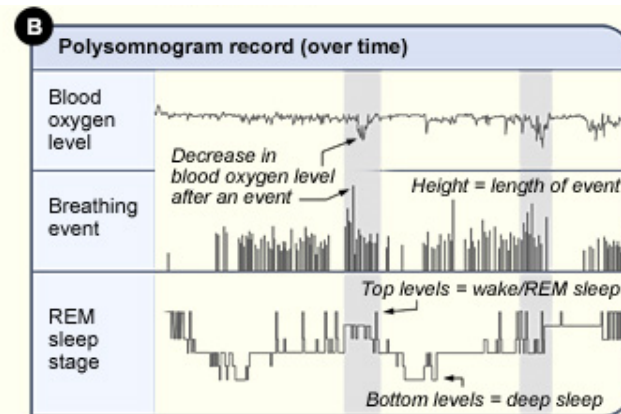
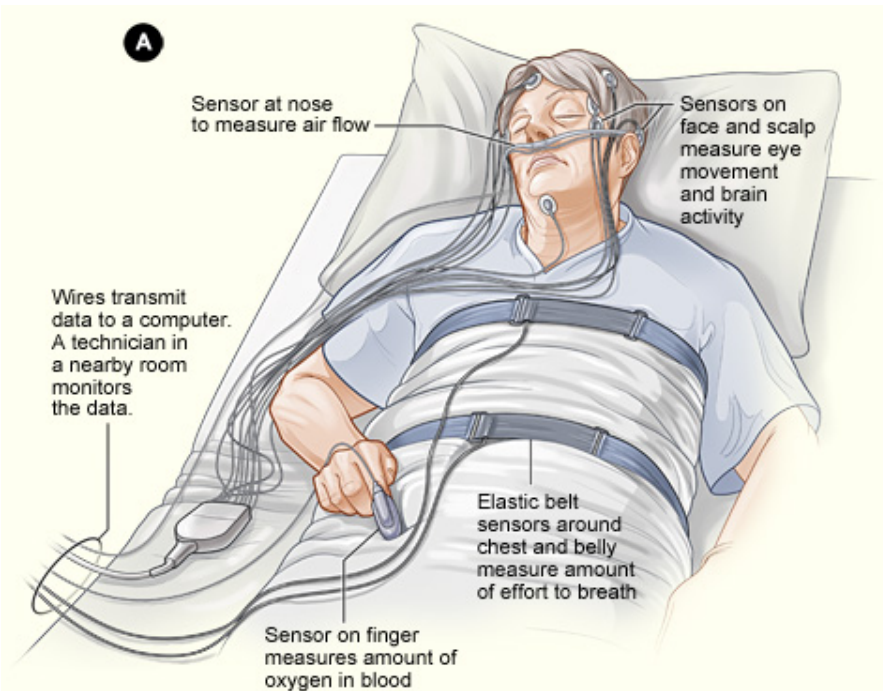
Why do we care?

- Sleep apnea interrupts sleep – terrible!
- Daytime sleepiness is a major complaint
- Nocturnal hypoxemia is bad.
 - Puts a strain on the heart
 - Contributes to “pulmonary hypertension”
 - May contribute to systemic hypertension and heart disease

How do we find it?

- Symptoms: snoring, daytime sleepiness
- Low oxygen at night- “overnight oximetry”
- Sleep study: “polysomnogram”
 - Formal sleep study in sleep lab
 - Measures how often there is no airflow and oxygen levels fall
 - Can be done at home IF not on oxygen

How do we find it: Polysomnogram



Poly – many. Somno = sleep Gram = recording

How do we treat it?

CPAP: Continuous Positive Airway Pressure

Can try dental devices, weight loss

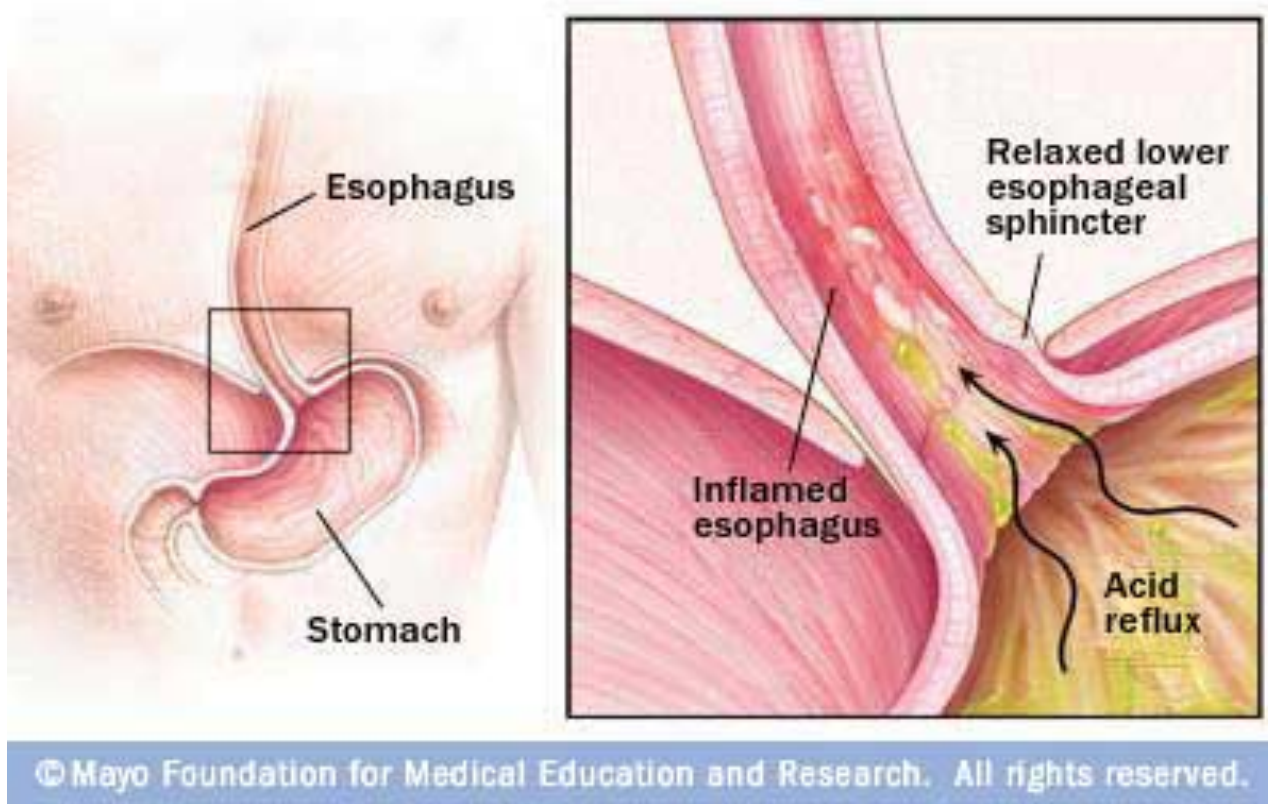


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What is “GERD”?

Gastro-Esophageal Reflux Disease

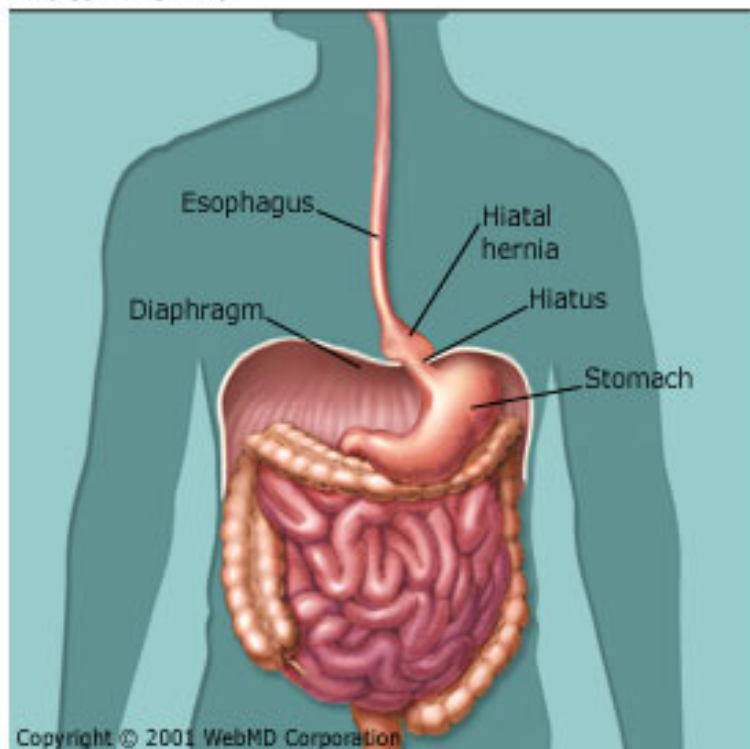


Why is it associated with ILD?

- Small study tested 17 patients with IPF
 - 16 had GERD, but only 4 had symptoms!
 - Later study found 87% of IPF patients had GERD, about half had symptoms
- Splashing acid into lungs may cause ILD
- High pressures in breathing may cause reflux

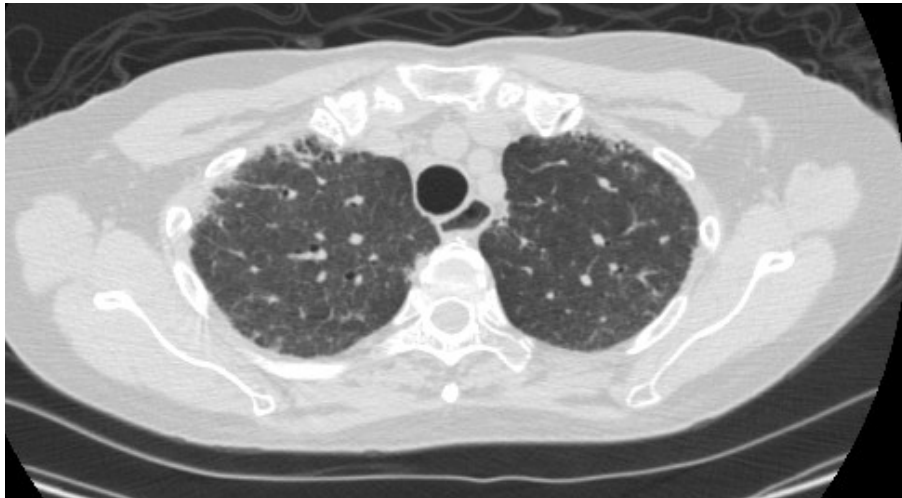
Hiatal hernia makes reflux even more likely

Hiatal Hernia



- Hiatal hernia more common in patients with IPF
- 37% of IPF patients by CT scans
- Compared to 16% of asthmatics and 13% of patients with COPD

Enlarged esophagus increases reflux



Patient with scleroderma showing “patulous” – enlarged and floppy - esophagus

Why do we care?

- Aspiration: inhaling substances into the lung
- “Micro-aspiration” – inhaling small amounts of acid or stomach contents into the lung
- Causes fibrosis in models
 - “*in vivo*” (in living animals)
 - “*in vitro*” (in cells grown in a dish)
- May contribute to cough

How do we find it?

- Symptoms
- pH probe testing
 - Probe into esophagus
 - Records acid exposure
- Barium swallow
 - Drink “contrast”
 - Can be seen going into stomach or refluxing up



[Cleve Clin J Med.](#) 2015 Oct;82(10):685-92.

<http://kansasvoicecenter.com/kvcwp/wp-content/uploads/2013/05/pH-Probe-1.jpg>

<http://www.radiologyclearwater.com/General.aspx>

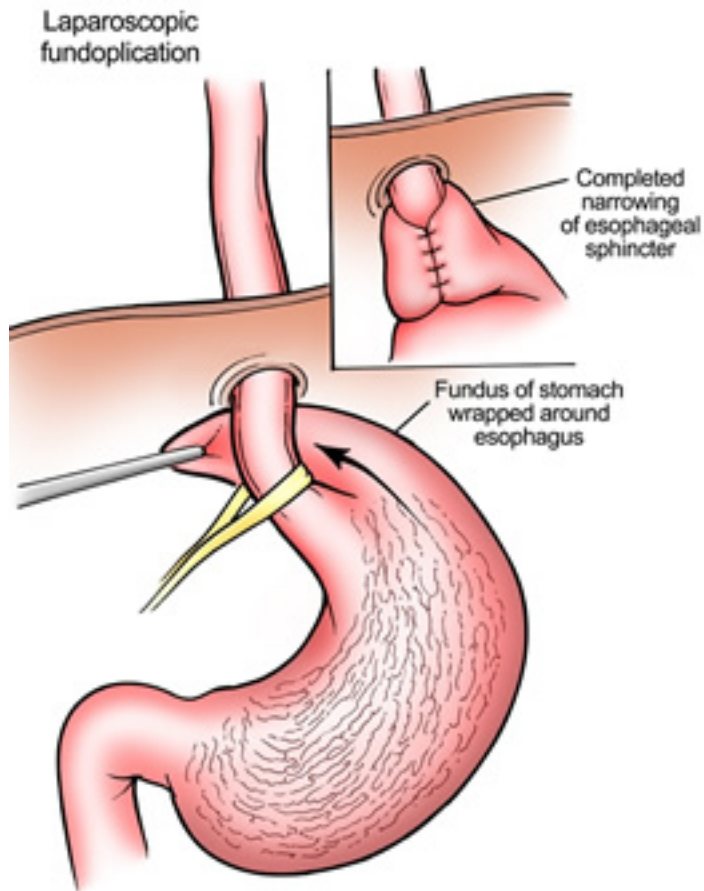
How do we treat it: Lifestyle

- Elevating the head of the bed, lying on left side reduced reflux (measured by pH probe)
- Avoid eating before bedtime

How do we treat it: Medication

- Reduce acid in esophagus
- No studies proving effect in fibrosis
- Pilot study for cough - might work
- H2 blockers:
 - famotidine (Pepcid), cimetidine (Tagamet), * ranitidine (Zantac) recalled!
- “PPIs” **P**roton **P**ump **I**nhibitors
 - Over the counter: omeprazole (Prilosec), lansoprazole (Prevacid), esomeprazole (Nexium)
 - Prescription only: pantoprazole (Protonix), rabeprazole (AcipHex), dexlansoprazole (Dexilant, Kapidex))

How do we treat it: Surgery



- Clinical trial of minimally invasive surgery “fundoplication” for IPF
- Was safe, well tolerated
- No clear effect on fibrosis

Other comorbidities:

- **Coronary artery disease**
 - Up to 10% of deaths in IPF patients in one study
- **Venous thromboembolism (Blood clots)**
 - More common in IPF
 - Preventive blood thinners don't seem to help – warfarin may even be harmful
- **Lung cancer**
 - Screen based on smoking history. Radiation may be effective if surgery too risky
- **Depression**
 - Screen and provide support

Summary

- ILD is associated with several other conditions
- Emphysema is common
- Sleep apnea: Screen for nighttime hypoxemia and obstruction
- GERD: Consider lifestyle modification. Medication may help cough
- Pulmonary hypertension: Consider echocardiogram especially if low oxygen levels

