



## Pulmonary Problems after Transplant

Celebrating a Second Chance at Life Survivorship Symposium

April 17- 23, 2021



**Joe Hsu MD, MPH**  
Stanford Health Care

1

## Pulmonary Problems After Transplant

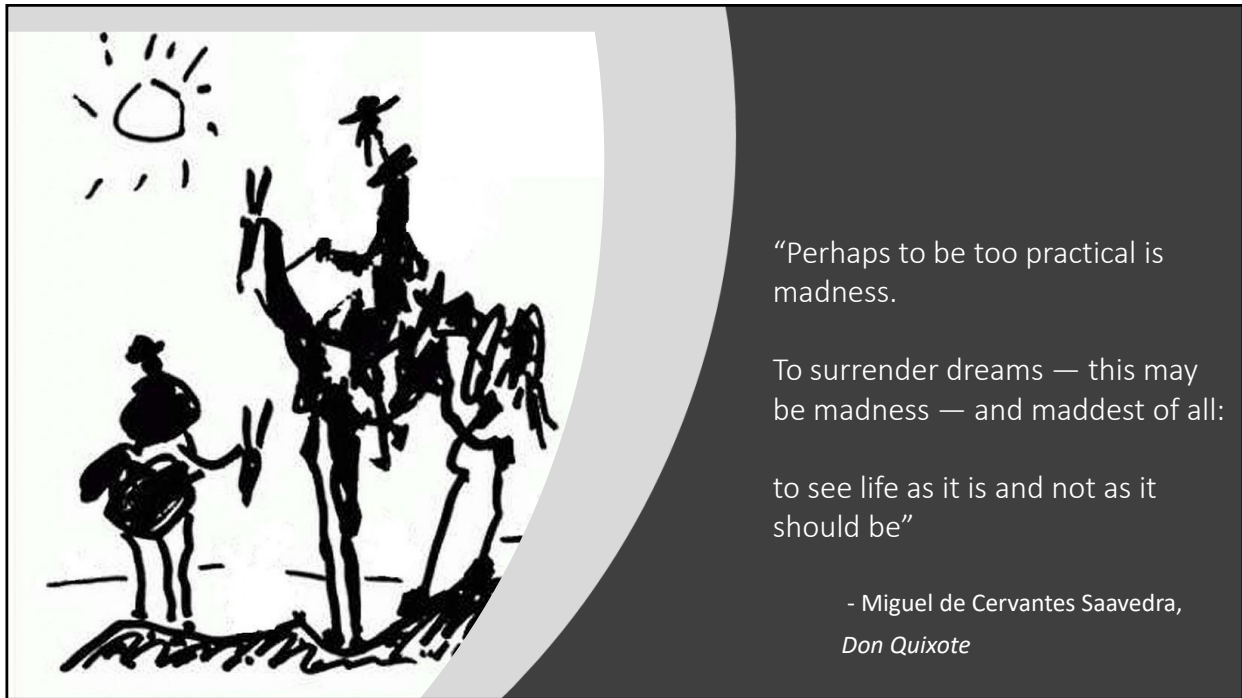


Joe Hsu MD, MPH  
Director of Stanford Lung GVHD clinic  
Pulmonary, Allergy and Critical Care Medicine



Jason Tirado (ANW) clinic "graduation day"

2



“Perhaps to be too practical is madness.

To surrender dreams — this may be madness — and maddest of all:

to see life as it is and not as it should be”

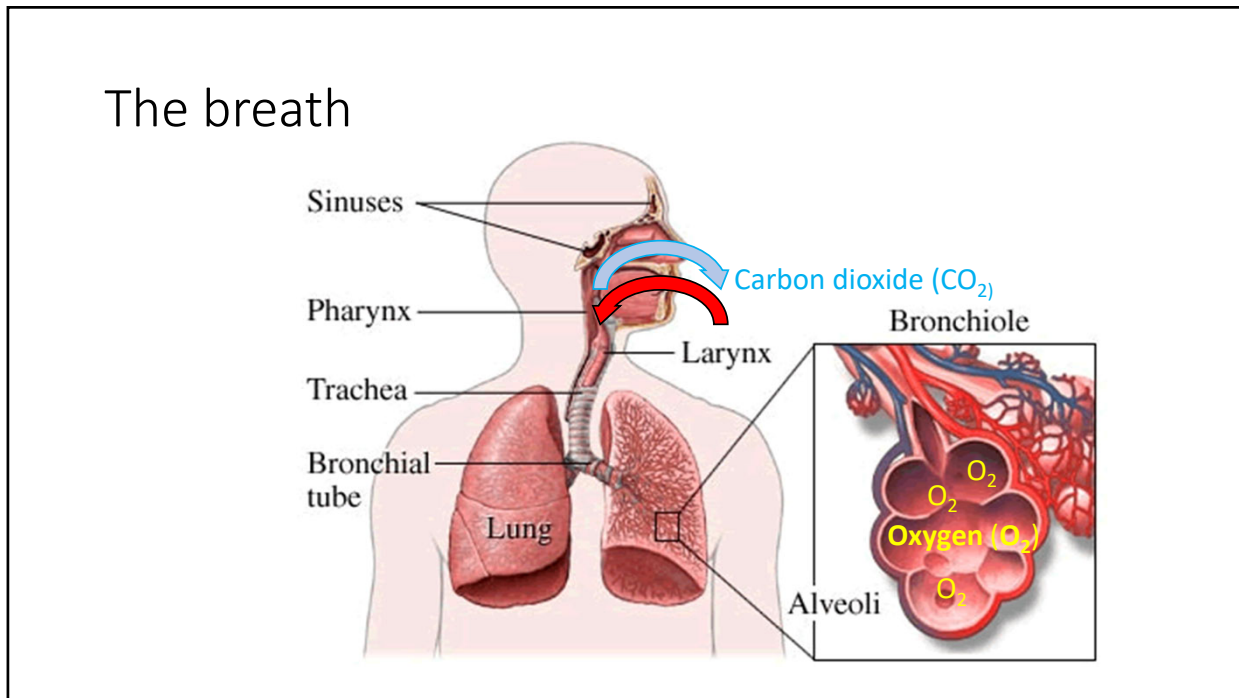
- Miguel de Cervantes Saavedra,  
*Don Quixote*

3

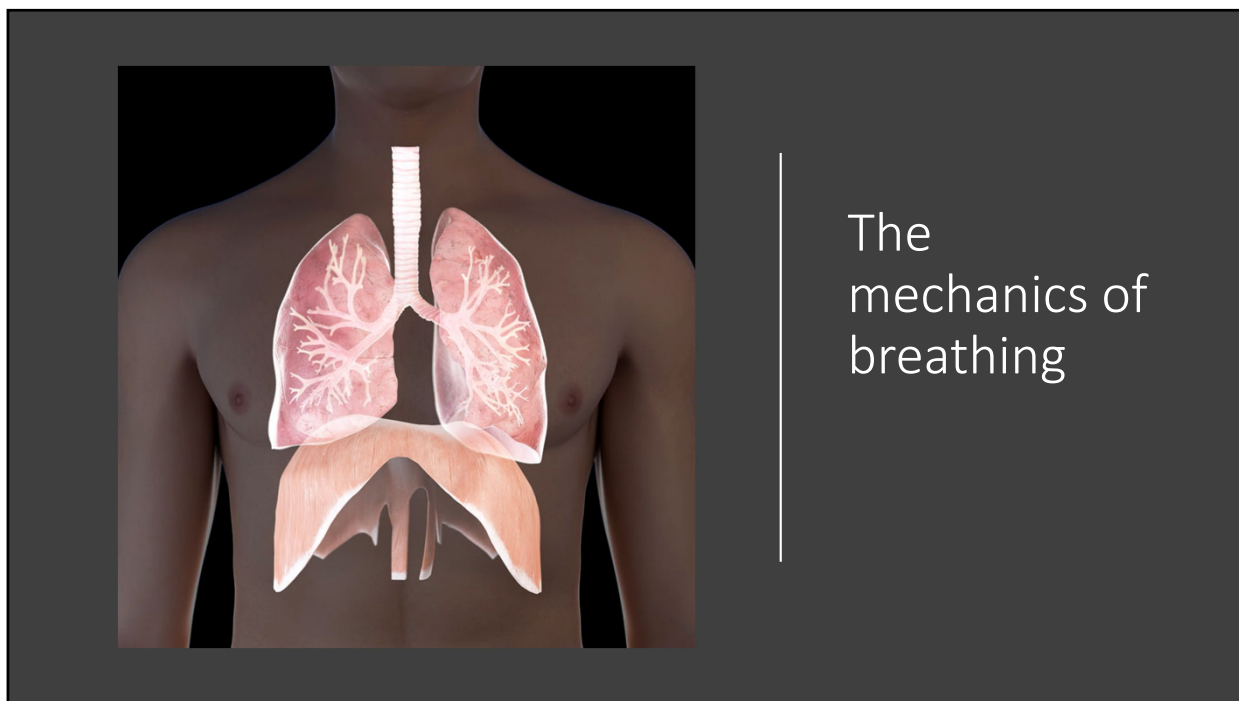
## Introduction

- The breath?
- How we really breathe?
- Understanding pulmonary problems after transplantation?
- Treatment
  - Current
  - Future
- Living with lung GVHD
- FAQs
- An American ninja warrior (ANW)

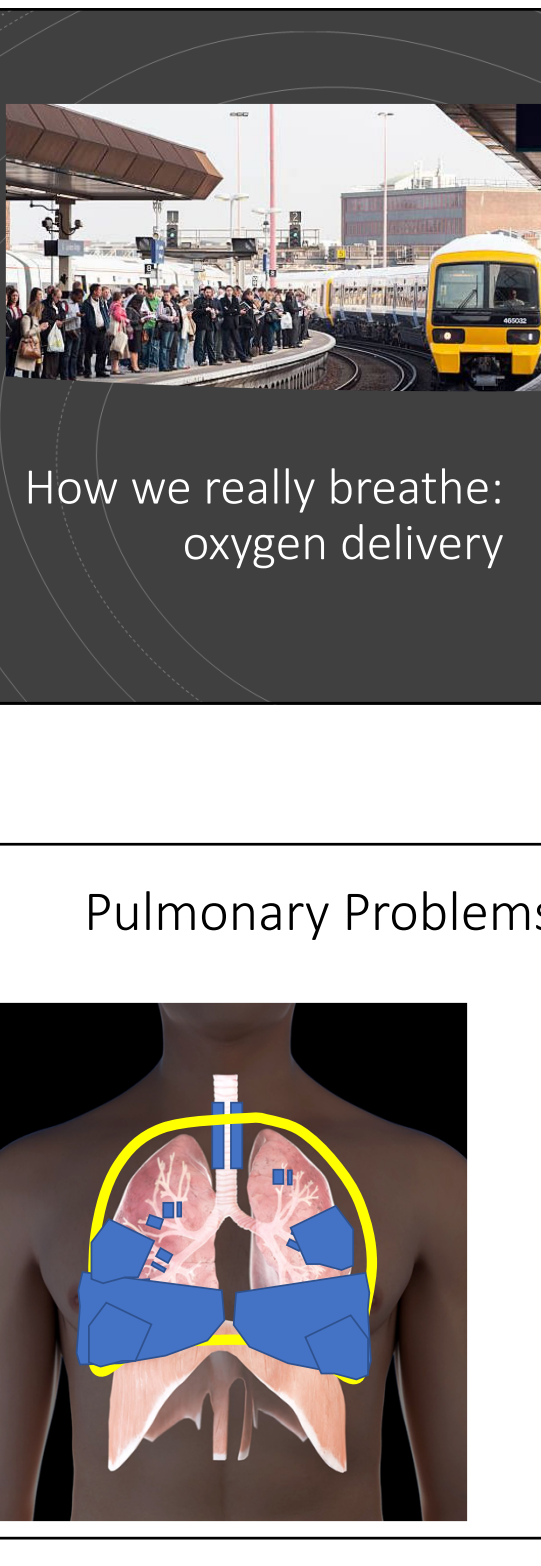
4



5



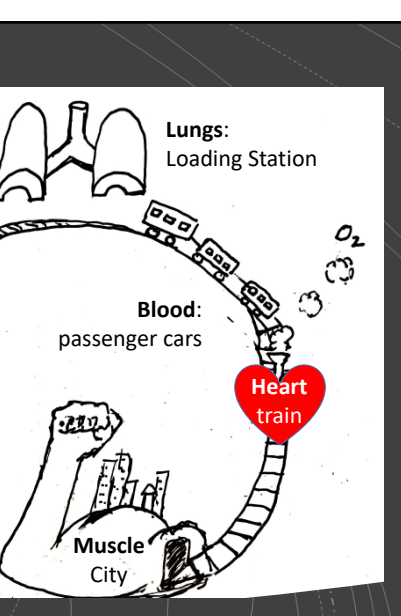
6



How we really breathe:  
oxygen delivery

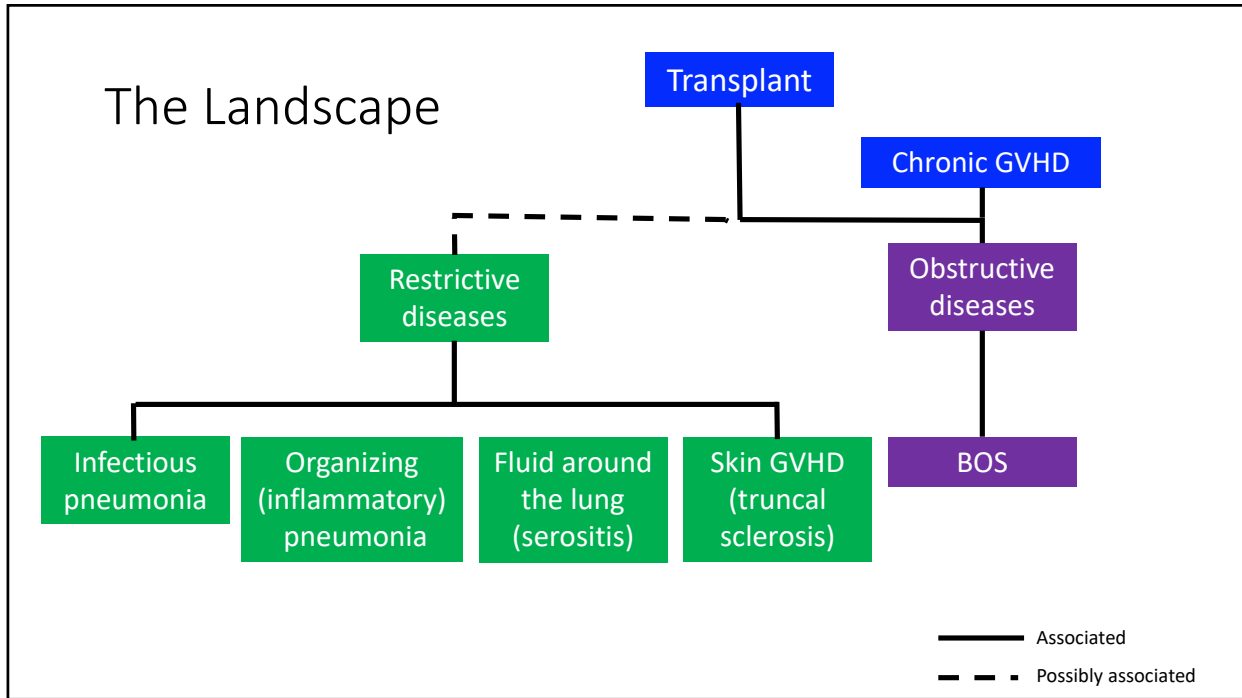
7

## Pulmonary Problems after Transplantation

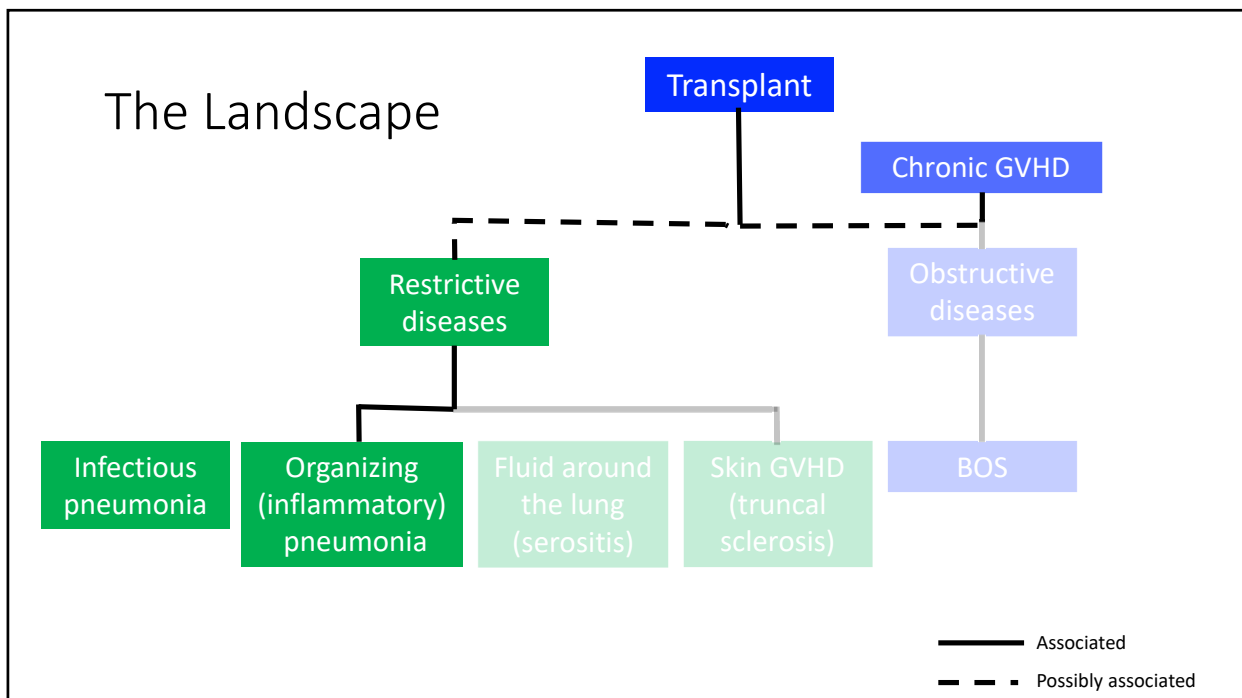


- Obstruction – mechanical problem
  - Bronchiolitis obliterans syndrome
- Restriction – smaller lungs
  - Chest/abdominal wall
    - Truncal sclerosis
    - Fluid - serositis
  - Pneumonia
    - Infectious: viral, bacterial, fungal
    - Inflammatory: Organizing pneumonia

8



9



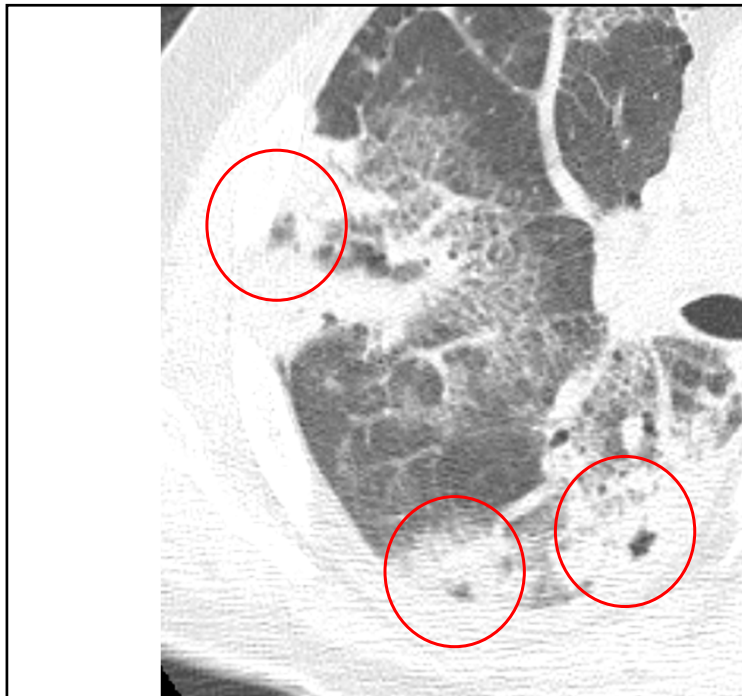
10

## Organizing Pneumonia

- Risk Factors
  - cGVHD
  - Viral infection
- Diagnosis
  - Signs/symptoms: 50% flu-like illness
    - Shortness of breath
    - Fevers,
    - Chest pain “catch”
    - Cough
- Treatment: Corticosteroids
- Relapse common



11

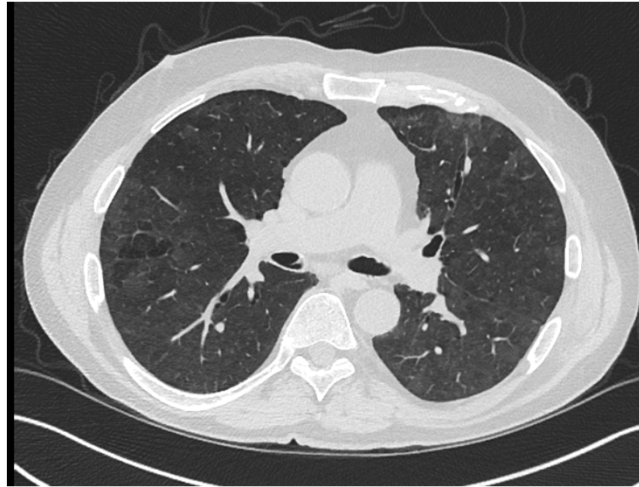


Atoll Sign: Organizing pneumonia

12

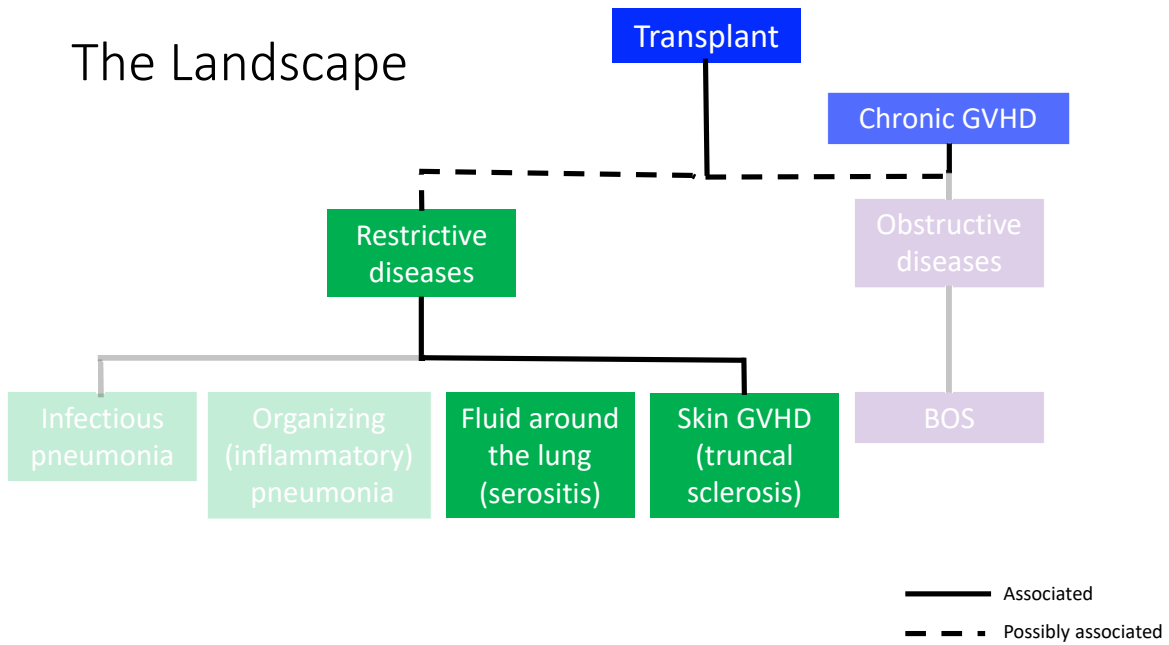


## 6-week follow-up



13

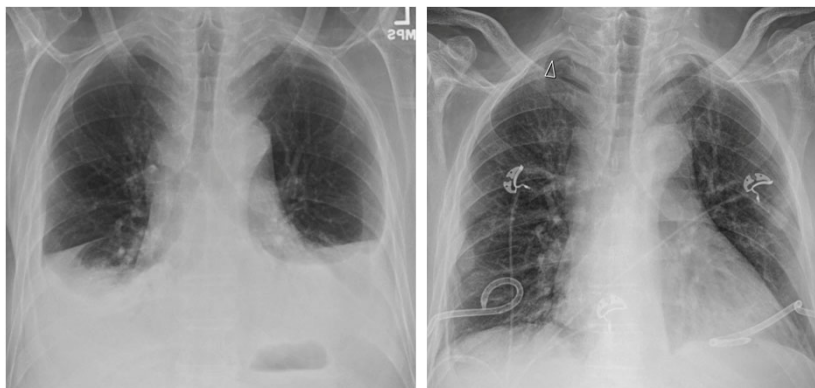
## The Landscape



14

## Inflammation of chest wall -serositis

- Fluid around the lung
- Heart usually normal
- Fluid may also present around the heart
- Treatment: Corticosteroids, drainage



15

## Truncal Sclerosis

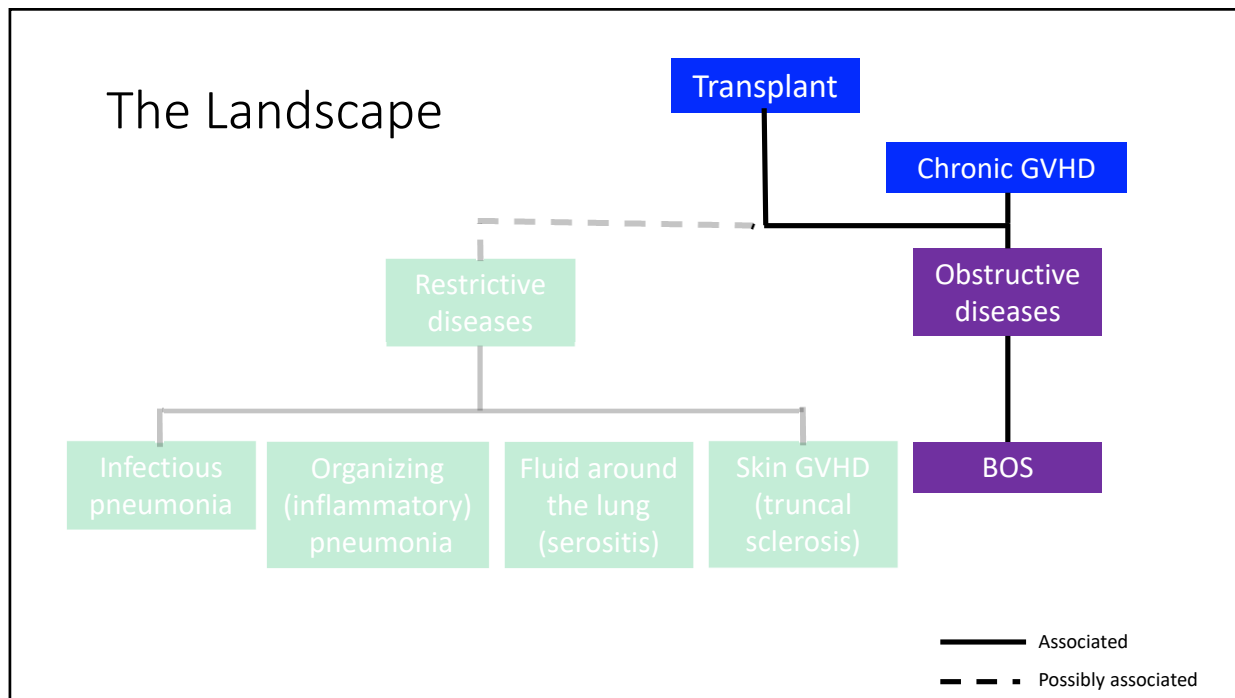


- Restrictive lung disease
- Tightening of chest and abdominal wall
- Symptoms
  - Shortness of breath when laying flat
- Treatment:
  - Extracorporeal photopheresis
  - Immune suppression
  - Future: anti-fibrotic

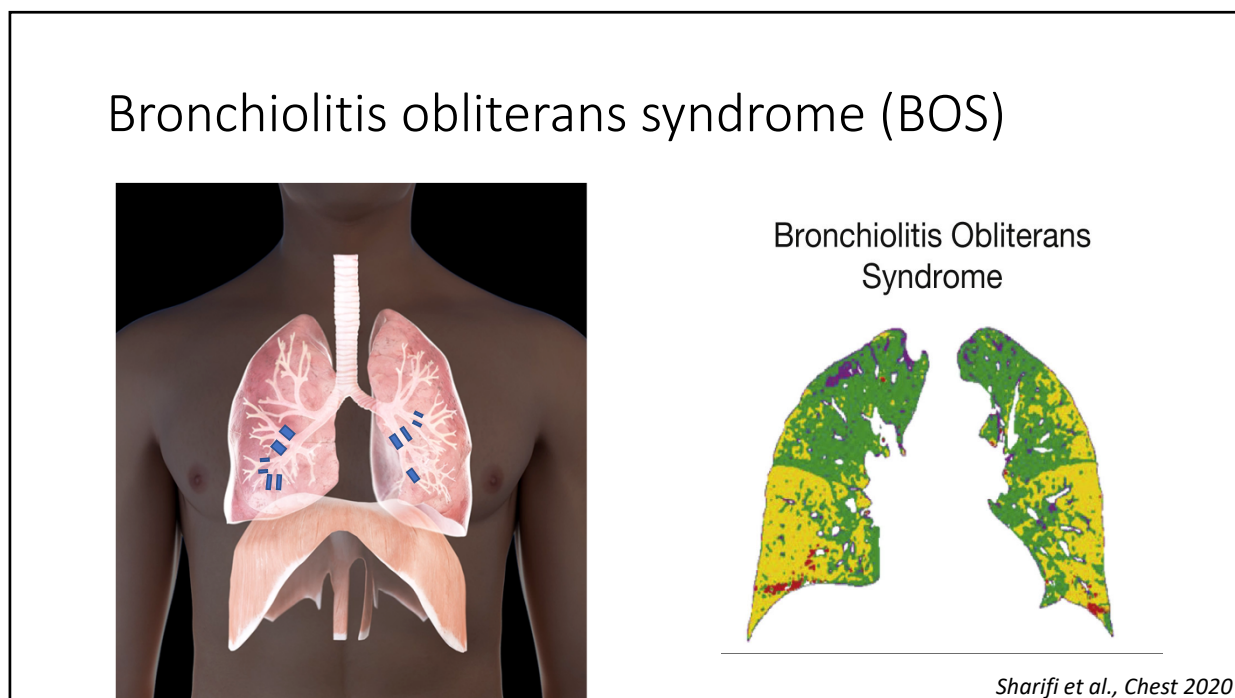
*Martires et al., Blood 2011*

16



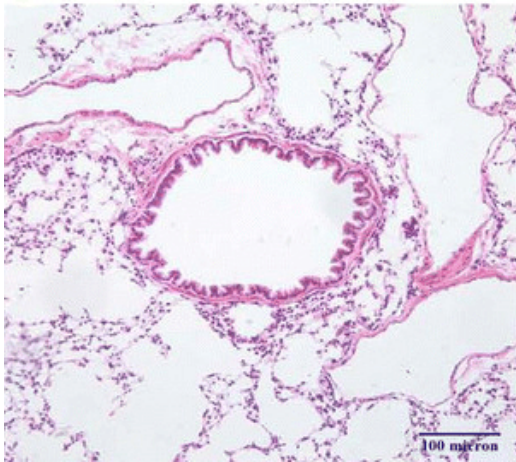


17

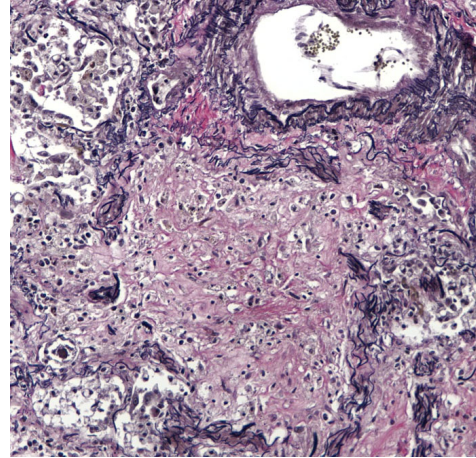


18

## Bronchiolitis obliterans syndrome (BOS)



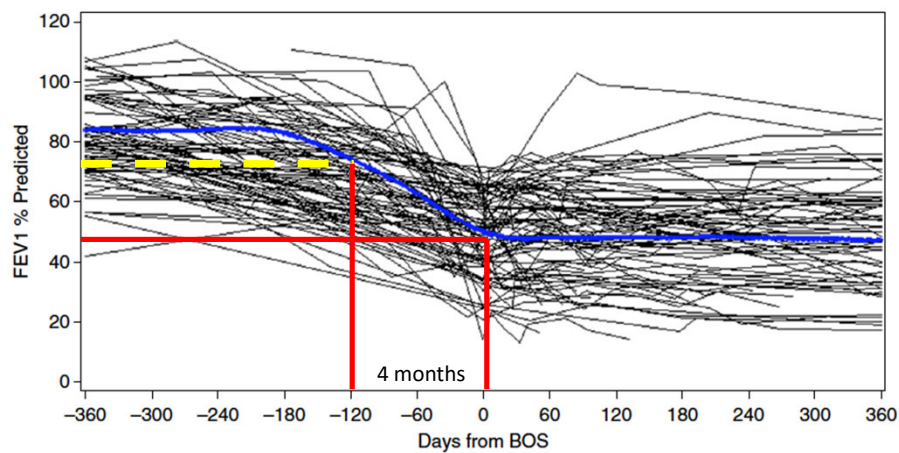
Normal lung



BOS lung

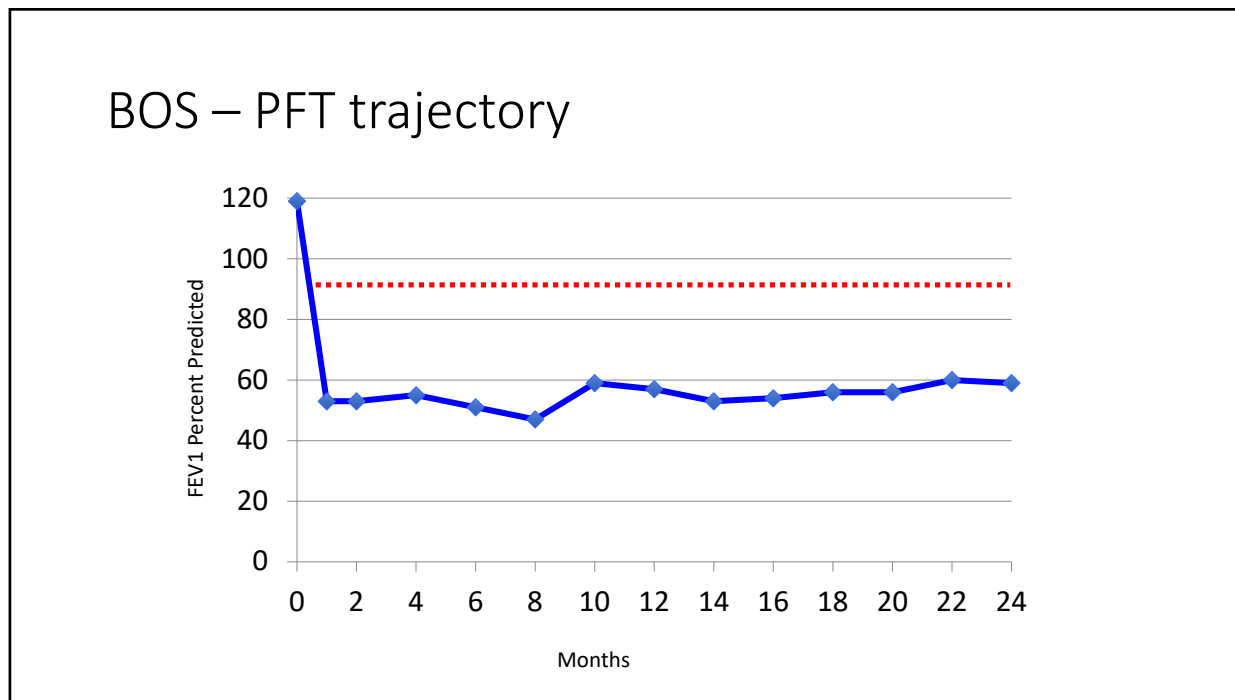
19

## Lung Function Trajectory in Bronchiolitis Obliterans Syndrome after Allogeneic Hematopoietic Cell Transplant

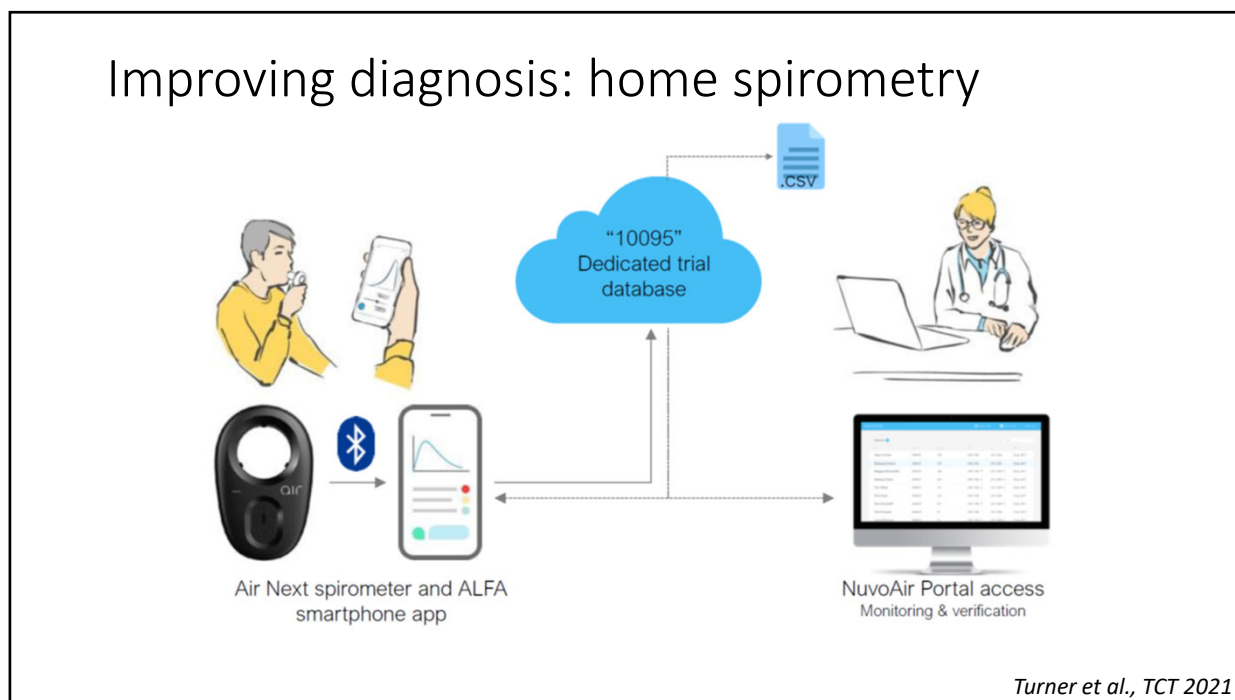


Cheng et al., Annals ATS 2016

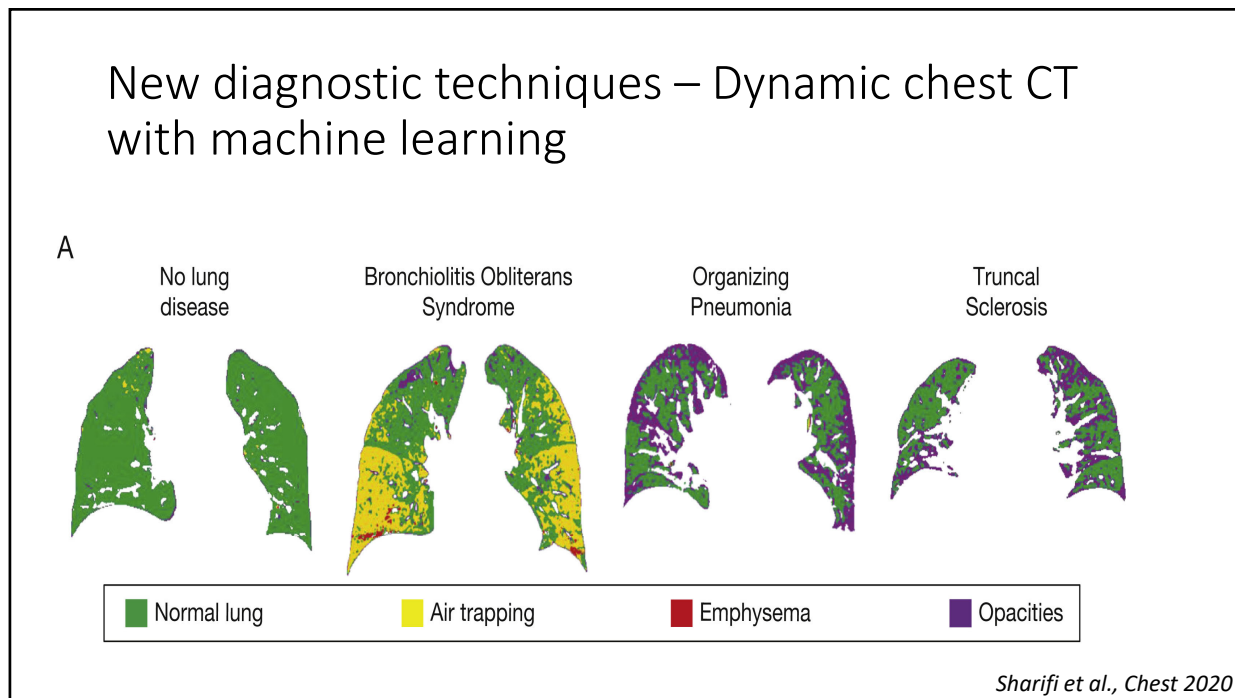
20



21



22



23

## Treatment

- FAM – fluticasone/LABA (inhaled steroid/long-acting bronchodilator), azithromycin, montelukast
- Immune suppression - prednisone
- Extracorporeal photopheresis

24

## Treatment for progressive disease

- Ibrutinib
- Imatinib
- Mycophenolate
- Entanercept

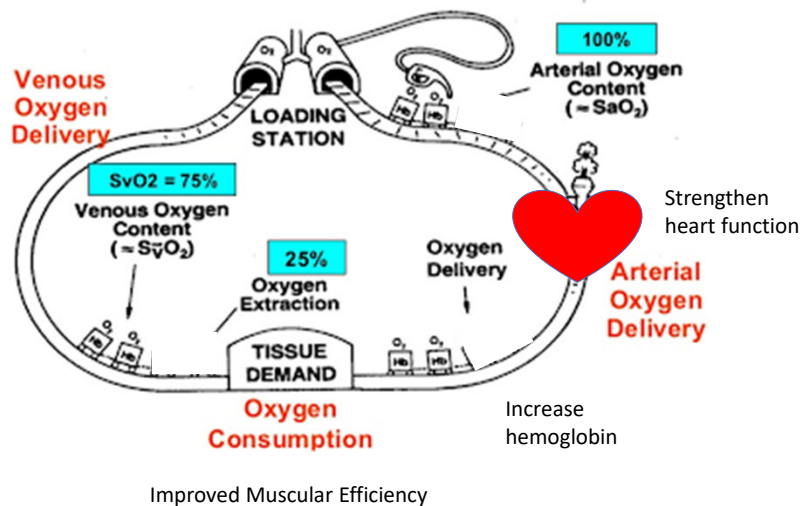
25

## Future treatments

- Belumodsil (KD025, ROCK Star study)
- Ruxolitinib: (NCT03674047)
- Nintenadib (NCT03805477)
- Interferon gamma 1b (NCT01639261)
- Alvelestat (NCT02669251)
- Pirfenidone (NCT03315741, STOP-BOS trial)

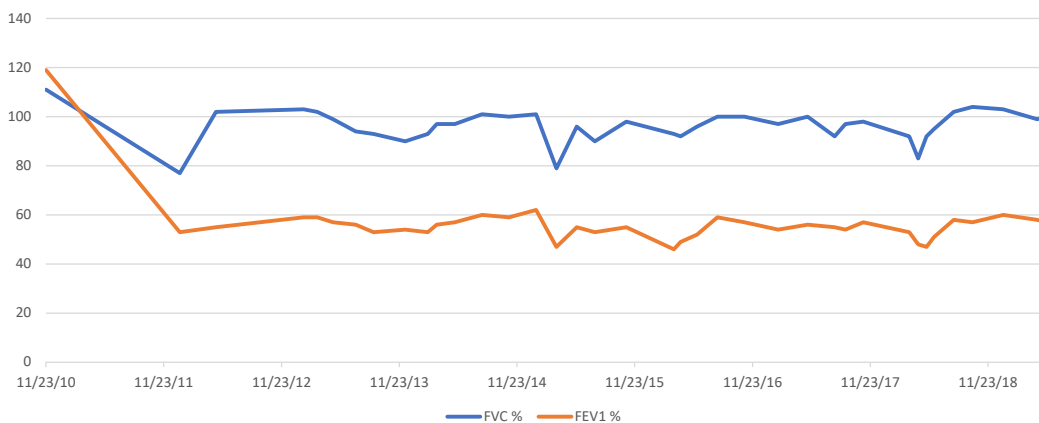
26

## Living with lung GVHD



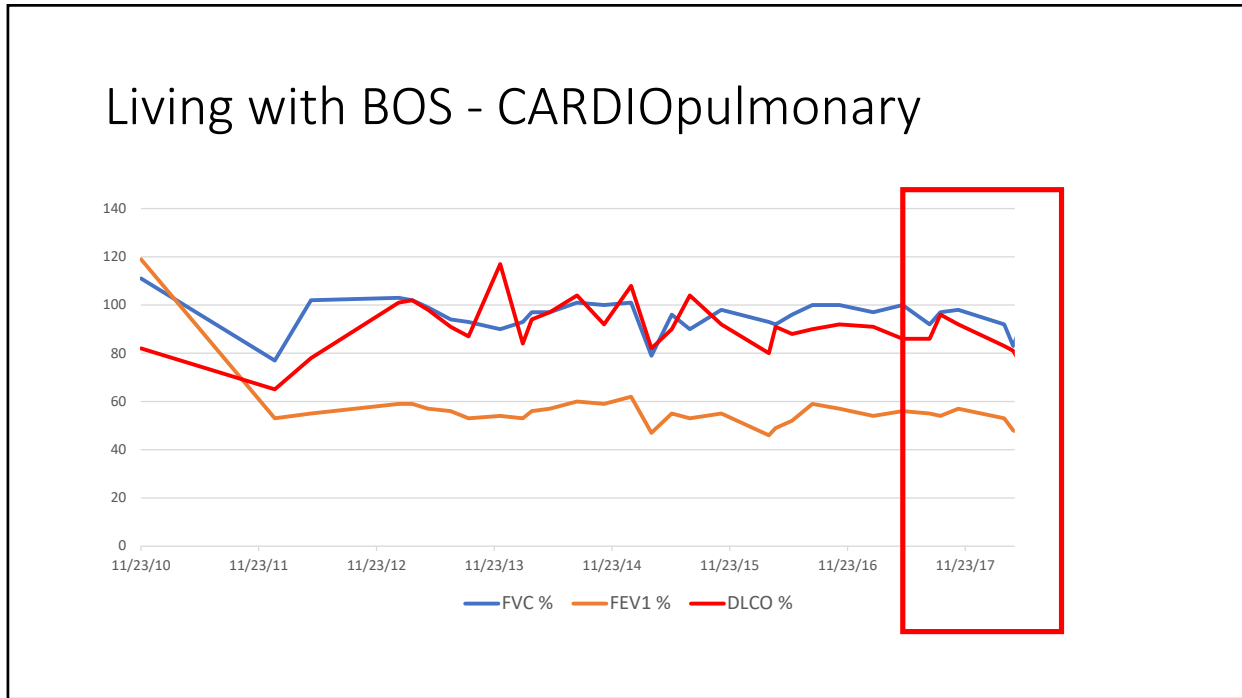
27

## Living with BOS – PFT surveillance is key

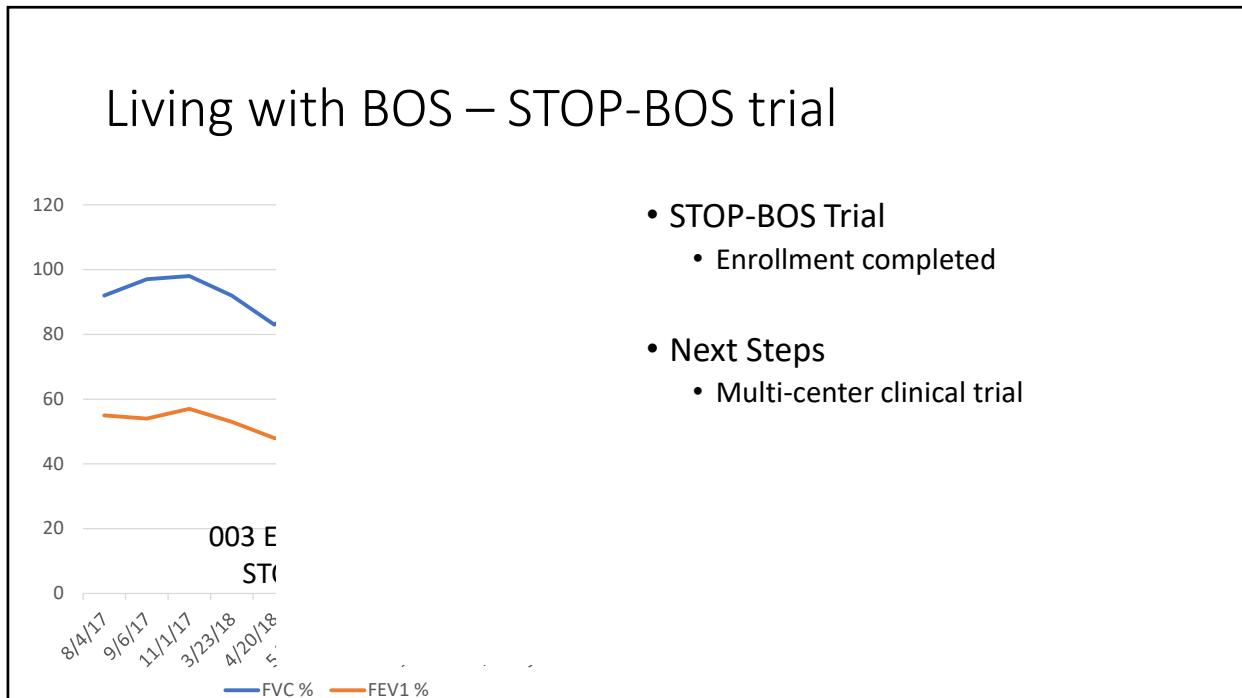


28

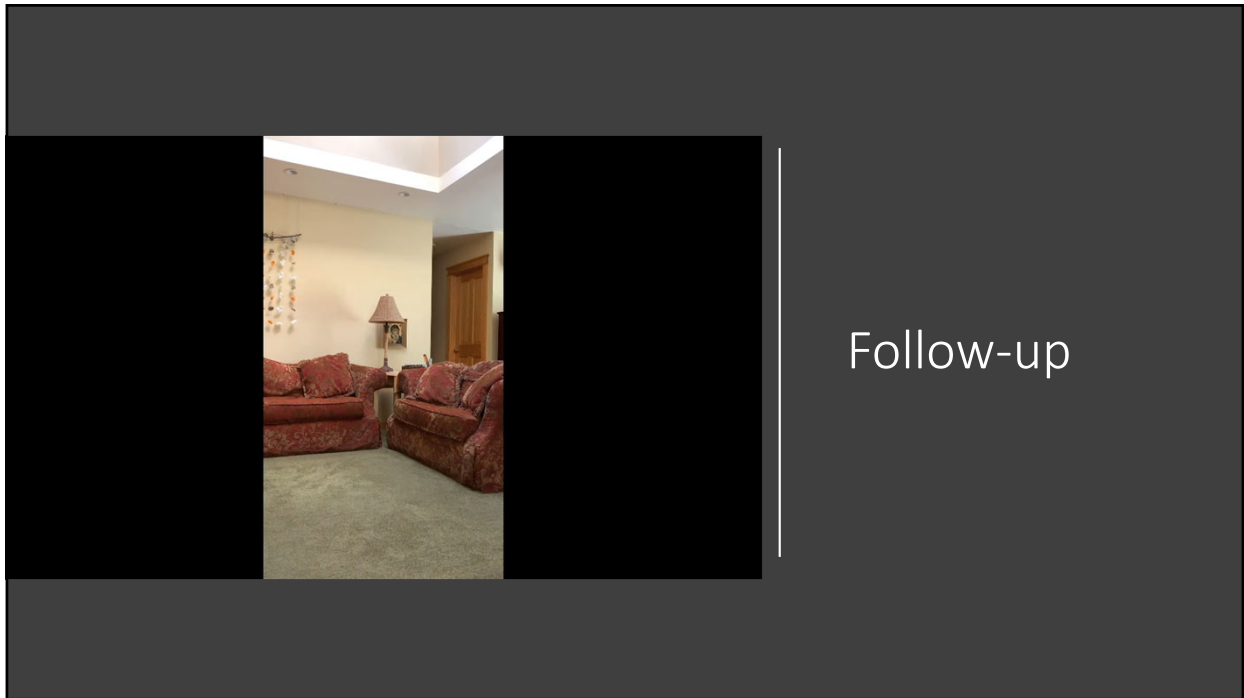




29



30



31

## FAQ: COVID?

- How do BMT patients do after infection with COVID-19?
  - No evidence that transplant patients do more poorly with COVID
- Should I get a vaccine?
  - Talk with your physician, recommended that transplant patients get vaccinated.
- Will the vaccine work?
  - Depends (being studied)
- Other considerations
  - Level of immune suppression
  - Recent GVHD flares requiring an increase in immune suppression
  - IVIG?

32

## FAQ: Lung Transplant

- Who can get a lung transplant
  - Free from cancer > 5 years, no serious infections
- What is the survival after lung transplantation?
  - The median survival post-lung transplant is 5-7 years
  - Median survival after bone marrow and lung transplant is 49-months<sup>1</sup>
- How do I know when I need a lung transplant?
  - Multidisciplinary decision
- Won't the GVHD just come back in the transplanted lung?
  - There is a high likelihood that the GVHD will re-occur in the transplanted lung

*1. Cheng et al. Biol Blood Marrow Transplant 2014*

33

## Conclusions

- Surveillance is critical for maintaining lung function
  - New diagnostic techniques
- Pulmonary problems can be
  - Restrictive (lung too small)
  - Obstructive (mechanical)
- BOS
  - Difficult to diagnose and treat
  - New treatments on the horizon
- Living with BOS: it takes a village

34



35

# Questions?

Celebrating a Second Chance at Life Survivorship Symposium 2021



[bmtinfonet.org](http://bmtinfonet.org) ♦ [help@bmtinfonet.org](mailto:help@bmtinfonet.org) ♦ 847-433-3313

36