Lung Transplantation for patients with ILD: Evaluation and selection

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Pulmonary Fibrosis Seminar
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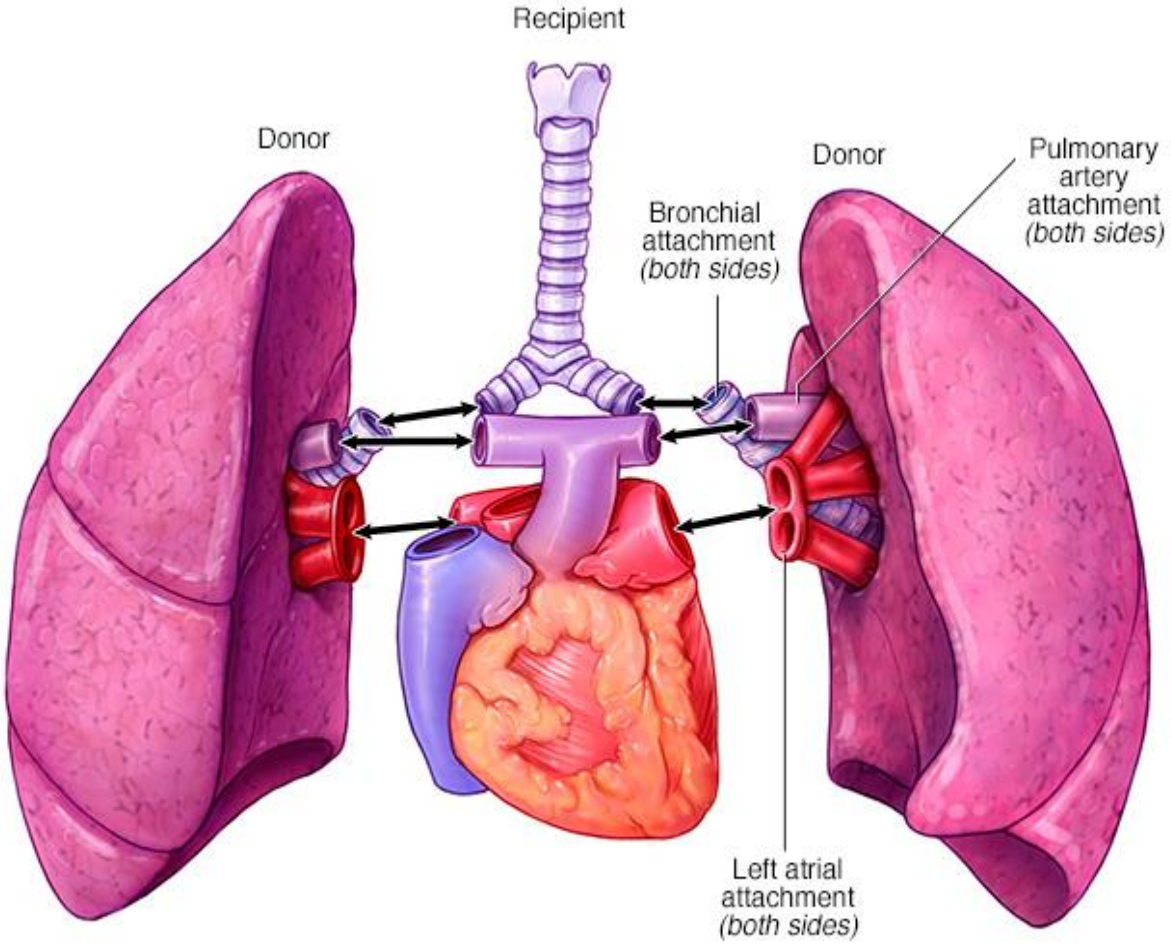
Objectives

- To understand
  - What is lung transplant?
  - Whom is lung transplant for?
  - How do we decide when a patient should be evaluated and listed for lung transplant?

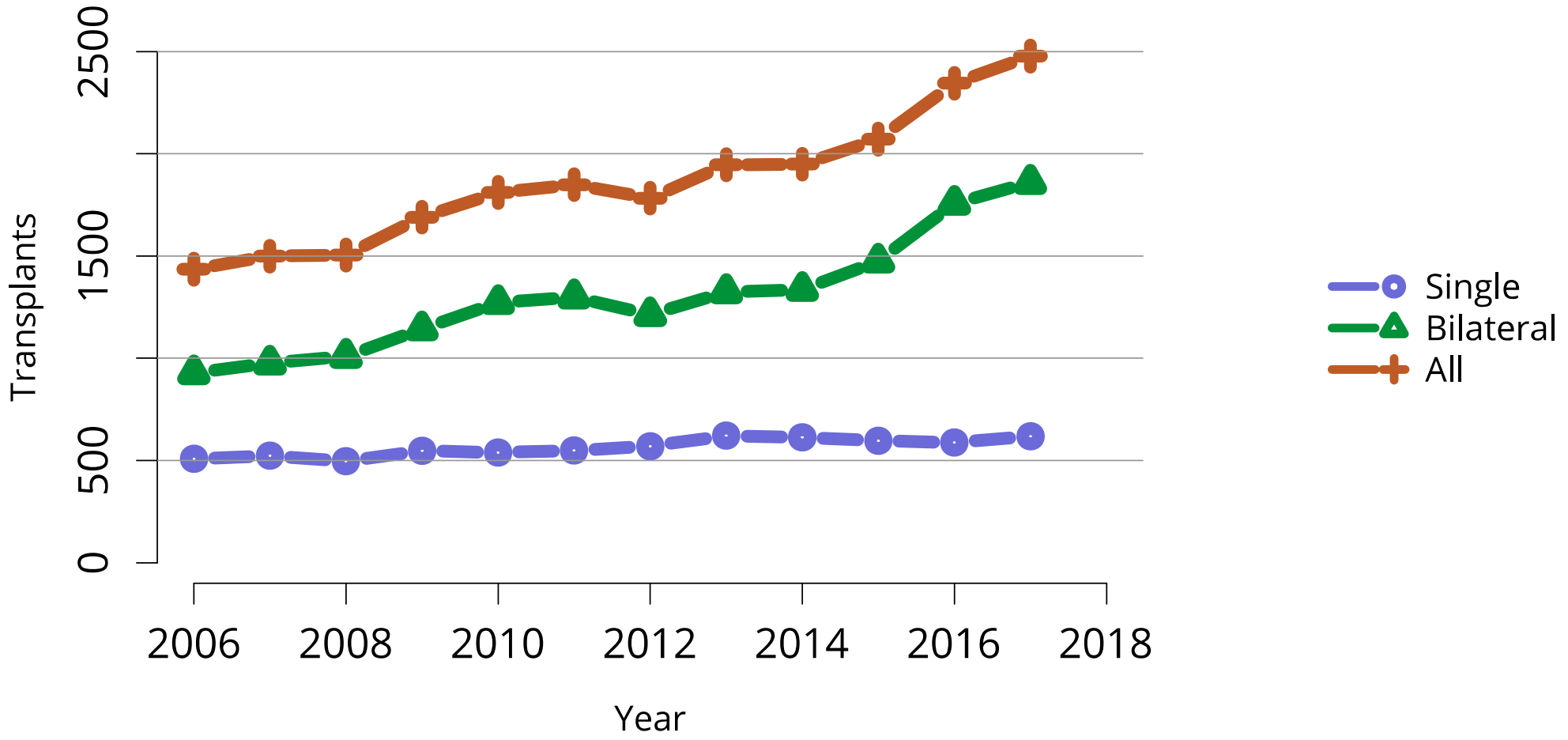
Lung Transplantation: An Overview

Lung Transplant



- Established therapy for forms of advanced lung disease
  - Prolonged survival
  - Improved quality of life
- First heart-lung transplant 1981 at Stanford
- First single-lung transplant 1983 at Toronto General

Lung Transplant Within the US



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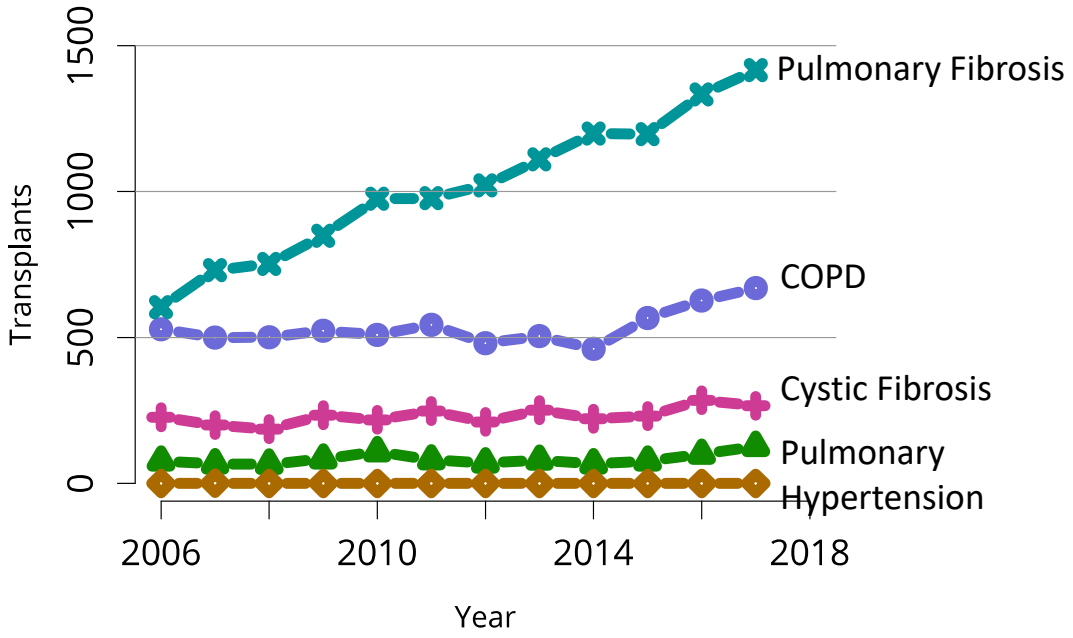
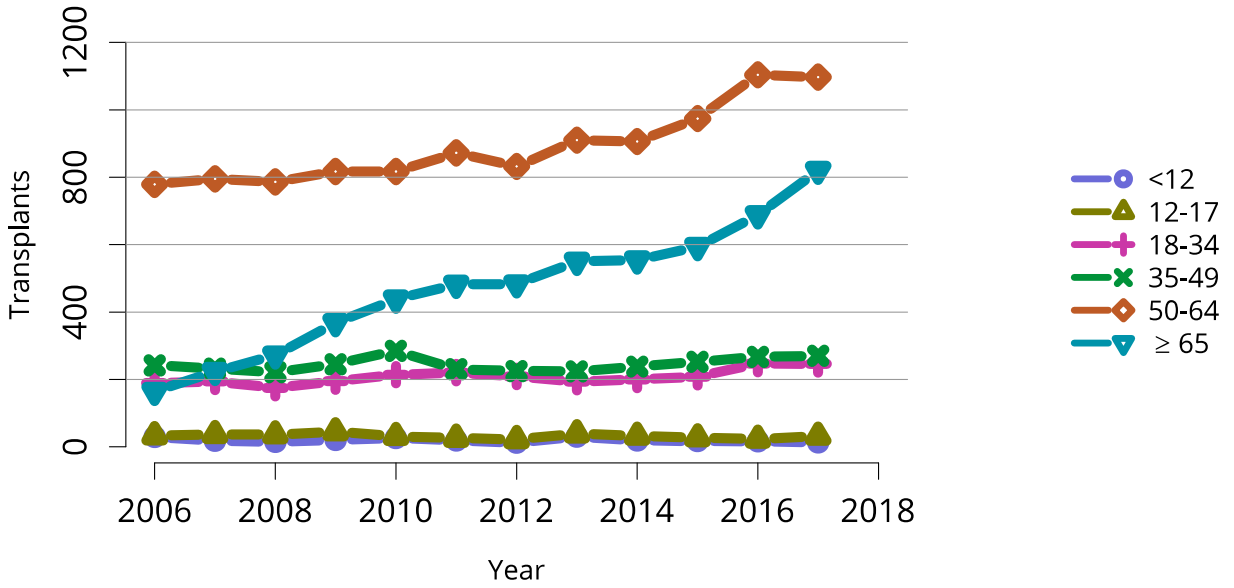
What Type of Patients Are Undergoing Lung Transplant?

Type of Disease?



Age?



In 2017, ~57% of lung transplant recipients had pulmonary fibrosis

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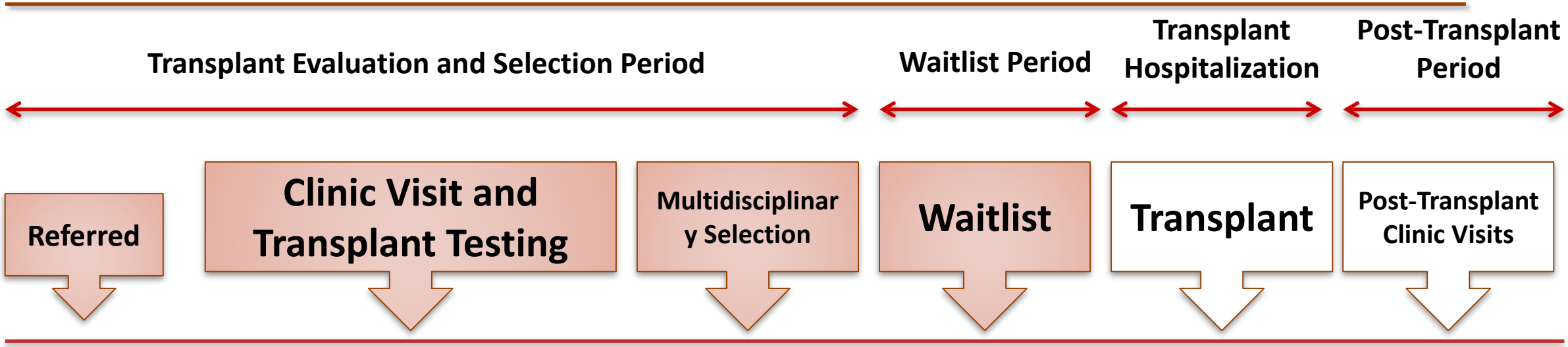
A “Typical” Lung Transplant Timeline



Lung Transplant Selection: For Whom and When?

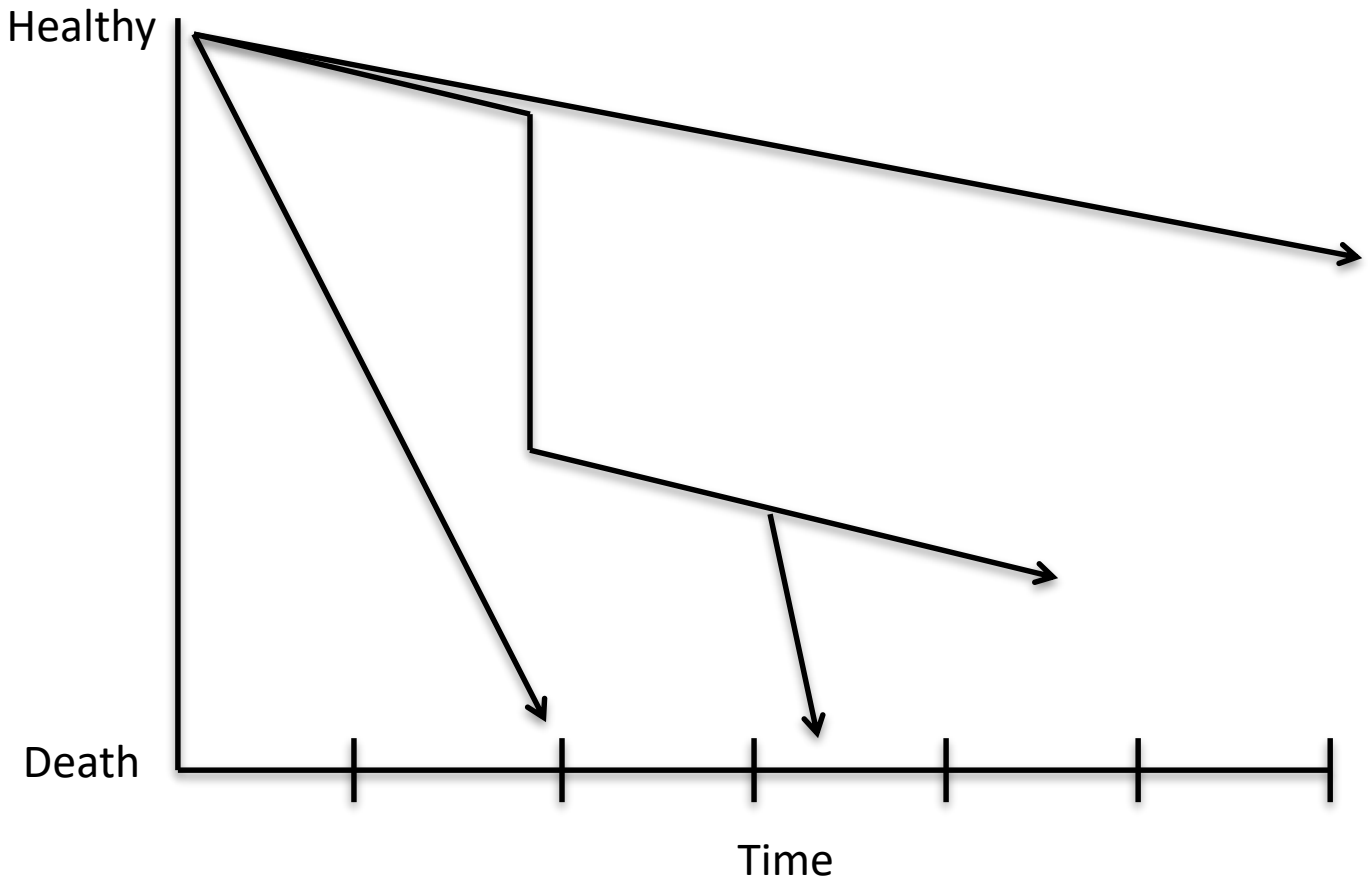
The 3 Questions To Answer

Q1. Do You Need a Lung Transplant and When?

- Are other effective treatment options available?
- Do you have end-stage lung disease with limited life expectancy?
  - High (>50%) risk of death from lung disease within ~2 years

Weill D, et al. JHLT 2015

IPF (and other ILDs) has an Unpredictable Course



Progressive disease

- Slowly progressive
- Rapidly progressive

Acute exacerbations

- Acute worsening of disease

Early Referral and Evaluation Important

Clinical Tools to Assess Transplant Timing in IPF

	Predictor	Points
G	Gender	
	Female	0
	Male	1
A	Age, y	
	≤60	0
	61–65	1
	>65	2
P	Physiology	
	FVC, % *predicted*	
	>75	0
	50–75	1
	<50	2
	DLCO, % *predicted*	
	>55	0
	36–55	1
	≤35	2
	Cannot perform	3
	Total Possible Points	8

Stage	I	II	III
Points	0–3	4–5	6–8
Mortality			
1-y	5.6	16.2	39.2
2-y	10.9	29.9	62.1
3-y	16.3	42.1	76.8

Table 4. **Proposed Utility of the Staging System**

Stage	Clinical Utility
Stage I	Low risk for mortality at 1 y (5.6%) Close monitoring (every 6 mo) for evidence of disease progression may be appropriate May not require immediate listing for lung transplantation Aggressive management of symptoms and comorbid conditions
Stage II	Moderate risk for mortality at 1 y (16.2%) Close monitoring (every 3–6 mo) for evidence of disease progression Consider listing for lung transplantation based on patient preferences, evidence of disease progression, and individual risk assessment by using the GAP calculator
Stage III	High risk for mortality at 1 y (39.2%) List immediately for lung transplantation if appropriate Palliative care referral if not a transplant candidate

GAP = gender, age, and 2 lung physiology variables (FVC and DLCO).

Ley B, et al. Annals 2012.

General Indications for When to Be Referred for Lung Transplant

- At the time of UIP (IPF) or fibrotic NSIP diagnosis, regardless of the lung function
- Abnormal lung function
  - FVC <80% predicted, DLCO <40% predicted
- Any oxygen requirement, even if only exercise-related
- For non-IPF ILD, failure to improve dyspnea, oxygen requirement, and/or lung function after a trial of medical therapy

Weill D, et al. JHLT 2015

General Indications for When to Be Listed for Lung Transplant

- Evidence of Disease Progression
  - Decline in FVC ≥10% within 6 months
  - Decline in DLCO ≥15% within 6 months
  - Decline in 6-minute walk test of >50m
  - Hospitalization because of respiratory decline or exacerbation
- Advanced Disease at Evaluation
  - Continuous oxygen requirement
  - FVC < 50% predicted, DLCO < 35% predicted

Weill D, et al. JHLT 2015

Q2. Are You an Acceptable Candidate for Lung Transplant?

- Do you have a high likelihood of surviving the transplant surgery?

- Do you have a high chance of successful longer-term benefit?

Weill D, et al. JHLT 2015

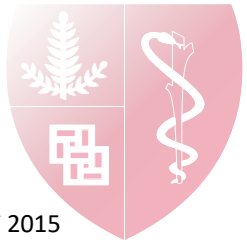
General Contraindications to Lung Transplant

Absolute Contraindications

- Recent Malignancy
- Untreatable other organ dysfunction (heart, liver, kidney, psychiatric)
- **Body mass index >35**
- **Limited functional status and poor rehab potential**
- History of non-adherence to medical treatments
- Absence of support system
- Substance use (active or recent)

Relative Contraindications

- Age >65 (varies by program)
- Body mass index 30-35
- Malnutrition
- Extensive prior chest surgery or chest wall scarring
- On life support (mechanical ventilation or ECMO)
- HIV/Hepatitis B/Hepatitis C
- Difficult to treat infections



Weill D, et al. JHLT 2015

Q3. Do You Want a Lung Transplant?

- Do you understand the risks/benefits of the surgery and the commitment required for a successful outcome?
- Be an informed patient

How Is It Determined Who Gets a Lung Transplant?

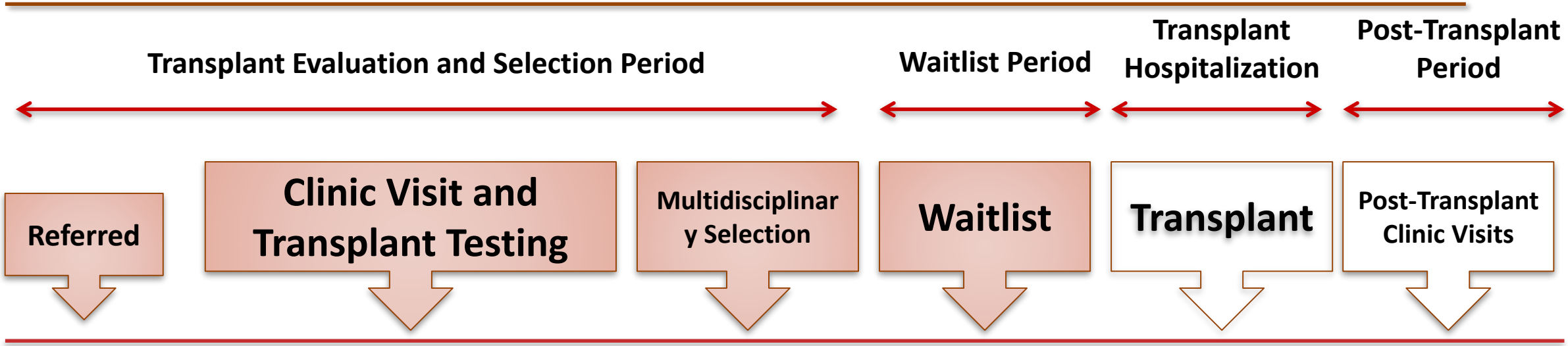
Figure 1: Lung transplant programs within each donor service area.

Donor lungs offered to waitlist candidates by:

- **Geography**
  - Candidates within 250 miles 1st priority
- **Blood type**
- **Lung Allocation Score**
  - Score from 0 to 100 assigned to every adult on the waitlist
  - Higher # = higher priority
  - It's based on how sick a patient is and the degree of benefit they would receive from transplant

Colvin-Adams M, et al. AJT 2012.

A "Typical" Lung Transplant Timeline



Key Points

- **Pulmonary Fibrosis is the most common indication for lung transplant and the number of lung transplants being performed for pulmonary fibrosis continues to increase nationwide.**
- **Early Referral is important.** Referral does not always = need to be on the waitlist.
  - It allows time for any barriers to transplant to be addressed (weight/BMI, conditioning, treatable cardiac disease)