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

Valapour M, et al. AJT 2019
What Type of Patients Are Undergoing Lung Transplant?

In 2017, ~57% of lung transplant recipients had pulmonary fibrosis.
A “Typical” Lung Transplant Timeline

1. Referred
2. Clinic Visit and Transplant Testing
3. Multidisciplinary Selection
4. Waitlist
5. Transplant
6. Post-Transplant Clinic Visits

Timeline:
- Transplant Evaluation and Selection Period
- Waitlist Period
- Transplant Hospitalization
- Post-Transplant Period
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

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Points</th>
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<tbody>
<tr>
<td>G</td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>0</td>
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<tr>
<td>Male</td>
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<tr>
<td>A</td>
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<tr>
<td>Age, y</td>
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<tr>
<td>≤60</td>
<td>0</td>
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<tr>
<td>61–65</td>
<td>1</td>
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<tr>
<td>&gt;65</td>
<td>2</td>
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<tr>
<td>Physiology</td>
<td></td>
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<tr>
<td>FVC, % predicted</td>
<td></td>
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<tr>
<td>&gt;75</td>
<td>0</td>
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<td>50–75</td>
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<td>&lt;50</td>
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<td>DLco, % predicted</td>
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<td>&gt;55</td>
<td>0</td>
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<td>36–55</td>
<td>1</td>
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<td>≤35</td>
<td>2</td>
</tr>
<tr>
<td>Cannot perform</td>
<td>3</td>
</tr>
<tr>
<td>Total Possible Points</td>
<td>8</td>
</tr>
</tbody>
</table>

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

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

GAP = gender, age, and 2 lung physiology variables (FVC and DLco).
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 $\geq 10\%$ within 6 months
  - Decline in DLCO $\geq 15\%$ within 6 months
  - Decline in 6-minute walk test of $>50$m
  - 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?
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?

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

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

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)