Lung Transplantation
An Overview

Anupam Kumar MD
Lung Transplant Program
Dr. James Hardy

University of Mississippi

First lung transplant: 1963

Survival: 18 days
The first successful lung (single) transplantation was performed by Dr. Joel D. Cooper at the University of Toronto on November 7, 1983.

Survived more than 7 years
NOTE: This figure includes only the adult lung transplants that are reported to the ISHLT Transplant Registry. As such, this should not be construed as representing changes in the number of adult lung transplants performed worldwide.
Who Gets a Lung Transplantation?

- COPD
- Pulmonary Fibrosis (Interstitial Lung diseases)
- Pulmonary Hypertension
- Cystic Fibrosis
- Sarcoidosis
“Because donated organs are a severely limited resource, the best potential recipients should be identified. The probability of a good outcome must be highly emphasized to achieve the maximum benefit for all transplants.”

OPTN/UNOS Ethics Committee General Considerations in Assessment for Transplant Candidacy. HRSA; 2010.
Donor Shortage

Donor organs:
• donated after brain death
• donated after circulatory death

Ideal donors:
• less than 55 years of age
• smoked less than 20 pack years
• normal chest radiograph & normal gas exchange
• absence of chest trauma, prior cardiothoracic surgery, known aspiration, sepsis, or purulent respiratory secretions
Eligibility for Lung Transplantation

• **High risk of death** ( > 50%) from lung disease without transplantation within two years.

• **High likelihood of survival** ( > 80%) at least 90 days after lung transplantation

• **High likelihood of post-transplant survival** ( > 80%) from a general medical perspective provided that there is adequate graft function.

• Satisfactory **psychosocial profile and support system**
Who May Not be a Transplant Candidate

- Malignancy within 5 years (exceptions)
- Untreatable significant dysfunction of another major organ (unless combined organ transplantation can be performed).
- Acute medical instability (e.g., acute sepsis, myocardial infarction, and liver failure).
- Chronic infection with highly virulent and/or resistant microbes
- BMI greater than 35 (or < 17)
- Significant debility (should be able to rehab)
- Chronic pain or narcotic abuse
- Current tobacco use (minimum of six month abstinence)
- Active drug or alcohol dependence
- Major psychiatric illness
- Current non-adherence to medical therapy or a history of repeated or prolonged episodes of non-adherence to medical therapy that are perceived to increase the risk of non-adherence after transplantation.
Evaluation for Lung Transplantation: The Team

- Social Workers
- Dietitians
- Physicians
- Pharmacists
- RN Coordinators
- Program Managers
Evaluation for Lung Transplantation

- Extensive testing: (Starts with screening)
- Pulmonary Function Tests
- CT scans
- Heart catheterization
- Cancer screening
- Psychosocial assessment
- Nutrition assessment
- Surgeon, Infectious Disease
Waitlist

Lung Allocation Score (LAS)

• LAS is used to determine the candidate's place on the waiting list and likelihood of benefit from lung transplantation.

• Higher scores represent higher urgency and greater potential transplant benefit
Post Transplant Care (including complications)

- **Immediate**: Hospitalization (prolonged hospital stay), graft dysfunction, infections

- **Late**: Rejection, Infection, Malignancies, Organ dysfunction (kidney)
Adult Lung Transplants
Kaplan-Meier Survival by Era
(Transplants: January 1990 – June 2016)

Median survival (years):
1990-1998: 4.3; Conditional=7.1;
1999-2008: 6.1; Conditional=8.6;
2009-6/2016: 6.5; Conditional=NA

1990-1998 vs. 1999-2008: p<0.0001;
1990-1998 vs. 2009-6/2016: p<0.0001;
1999-2008 vs. 2009-6/2016: p<0.0001

Survival (%)
Adult Lung Transplants
Kaplan-Meier Survival by Major Diagnosis
(Transplants: January 1990 – June 2016)

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0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21
Years

Survival (%)

All pair-wise comparisons were significant at p < 0.05 except A1ATD vs. ILD-non IIP, A1ATD vs. IPAH, COPD vs. ILD-non IIP and ILD-non IIP vs. IPAH.

Median survival (years):
A1ATD: 7.0; CF: 9.5; COPD: 5.9; IIP: 5.2; ILD-not IIP: 6.3; IPAH: 6.3.