Lung Transplantation
An Overview

Anupam Kumar MD
Lung Transplant Program

SPECTRUM HEALTH

Dr. James Hardy

University of Mississippi

First lung transplant: 1963

Survival: 18 days

Transplantation of the Lung *

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TRANSPLANTATION of the lung presents special problems. First, it is an intrathoracic organ and one involved in respiration. Second, a degree of neuromuscular activity is essential to adequate respiratory function, without which life ceases abruptly. Third, immunologic rejection of the lung homograft is difficult to detect in its early stages and poor function of the transplant may be incorrectly attributed to organ ischemia during transplantation, to postoperative congestion perhaps secondary to lung denervation, or to the homograft reaction. Various of our series of lung transplants involving more than 400 animals were directed towards solving certain of these several problems.[1, 6-8]

jected intravenously, and an endotracheal tube was inserted to permit rhythmical ventilation of the lung using a positive pressure apparatus. In the initial operations the bronchus, the pulmonary artery and the individual pulmonary veins were anastomosed. (Fig. 1) No attempt was made to restore continuity of the bronchial arteries. Unfortunately, a rather high incidence of postoperative thrombosis of the pulmonary veins was encountered. Thereafter a cuff of the atrium containing the inflowing pulmonary veins was excised with the lung, and the cuff was then used for an atrial anastomosis. This maneuver considerably decreased the incidence of thrombosis of the pulmonary veins and increased the number of chronic survivors. Silk sutures of

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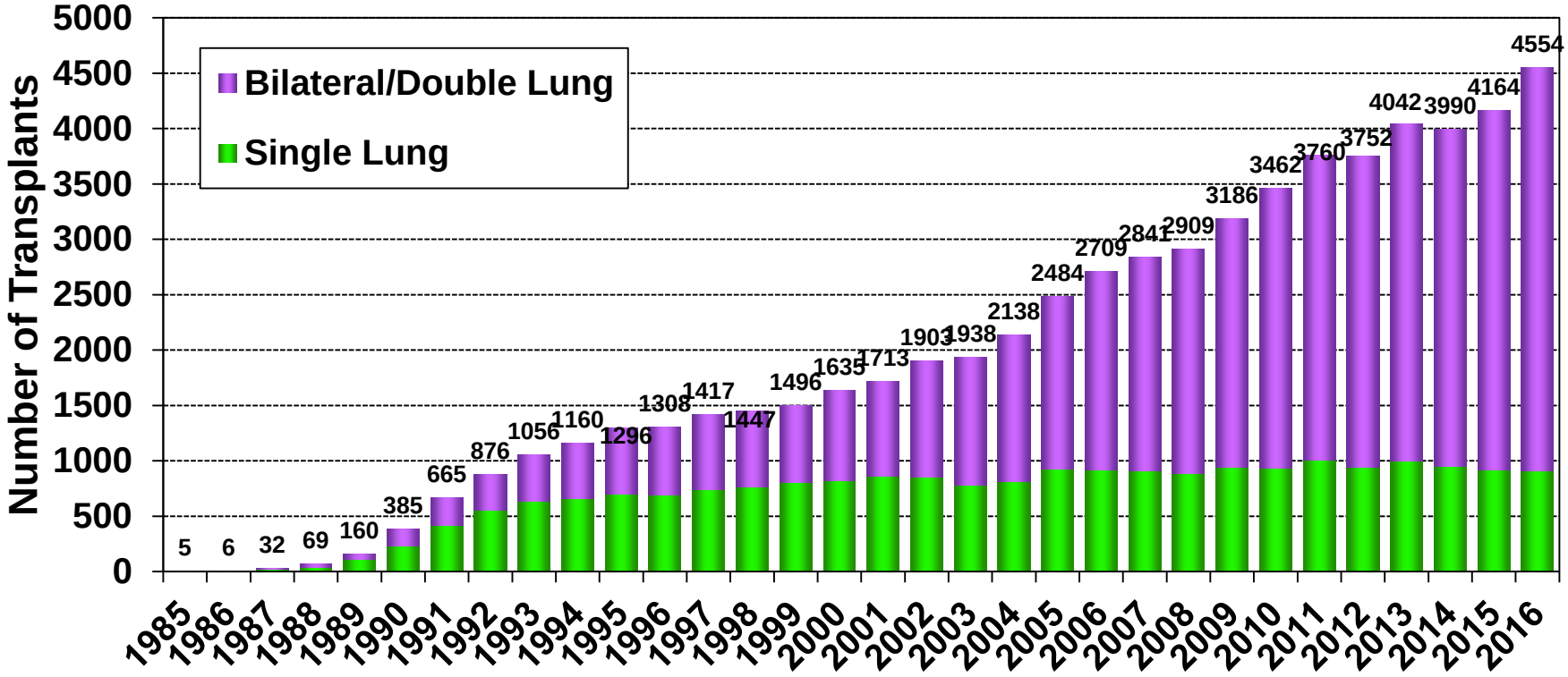
The first successful lung (single) transplantation was performed by Dr. Joel D. Cooper at the University of Toronto on November 7, 1983.

Survived more than 7 years

Adult Lung Transplants

Number of Transplants by Year and Procedure Type



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.

ISHLT • INTERNATIONAL SOCIETY FOR HEART AND LUNG TRANSPLANTATION
2018
JHLT. 2018 Oct; 37(10): 1155-1206

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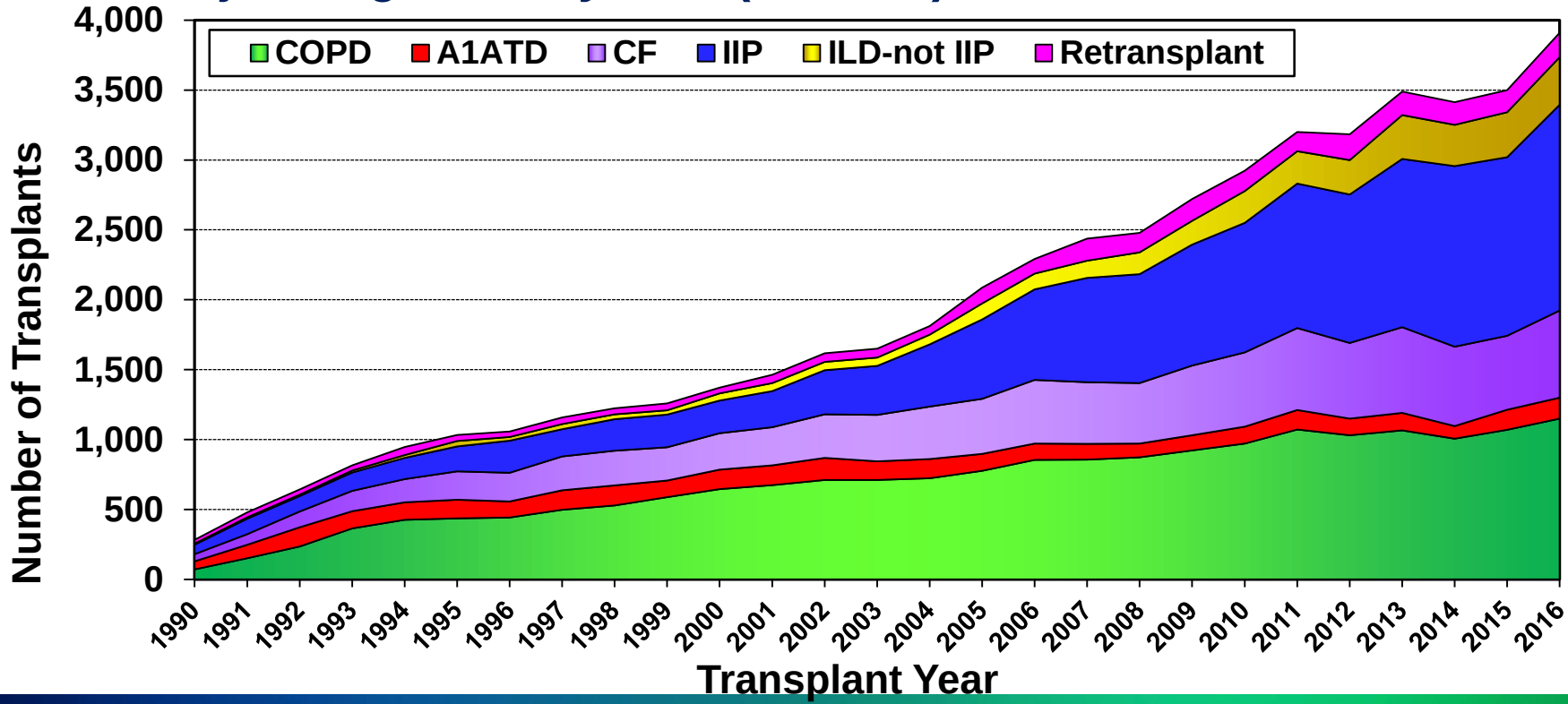
Who Gets a Lung Transplantation?

- COPD
- Pulmonary Fibrosis
  (Interstitial Lung diseases)
- Pulmonary Hypertension
- Cystic Fibrosis
- Sarcoidosis

Adult Lung Transplants

Major Diagnoses by Year (Number)



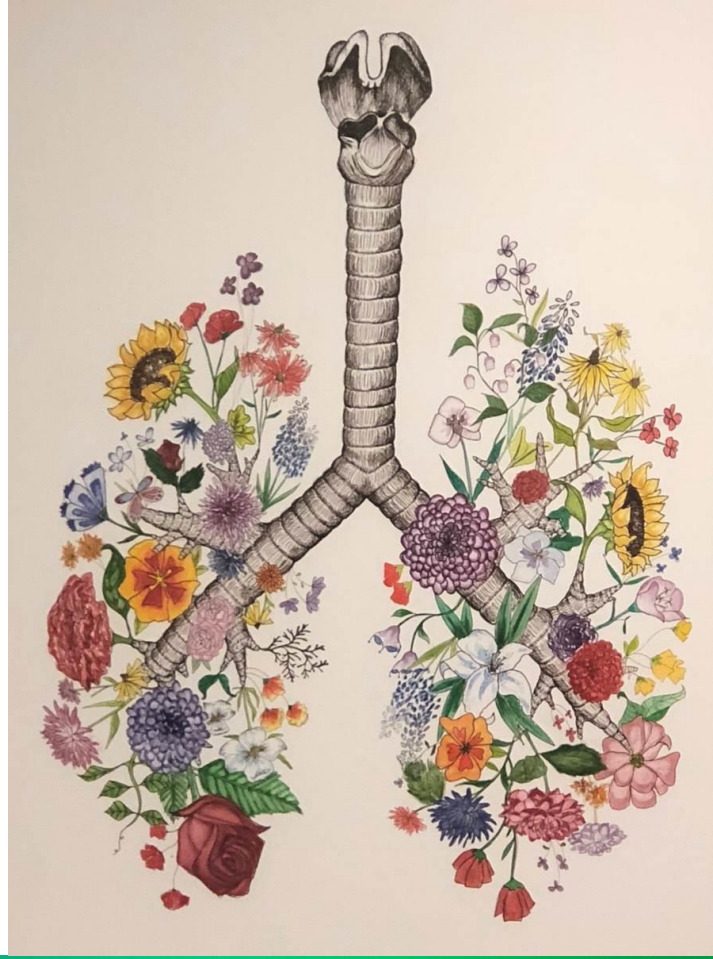
REFERRAL

EVALUATION

WAIT LIST

TRANSPLANT SURGERY

POST TRANSPLANT CARE

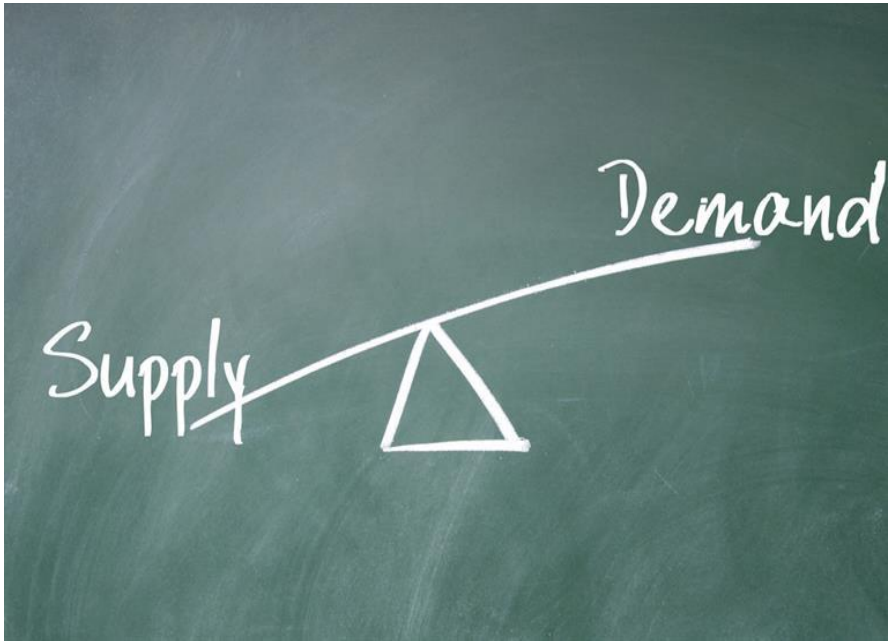


Ethical Considerations: Donor Shortage

"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

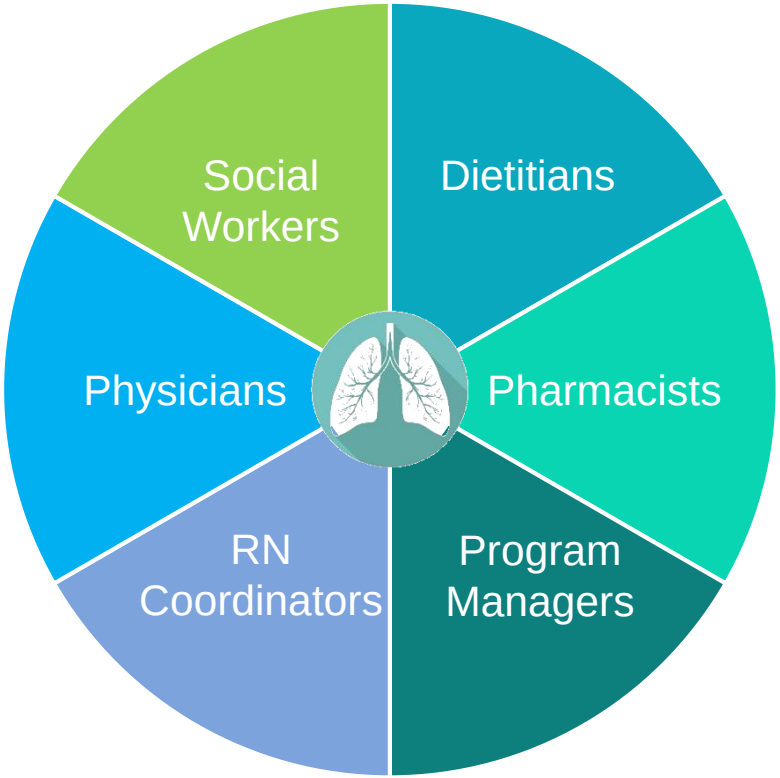
Eligibility for Lung Transplantation

- **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 (eg: 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



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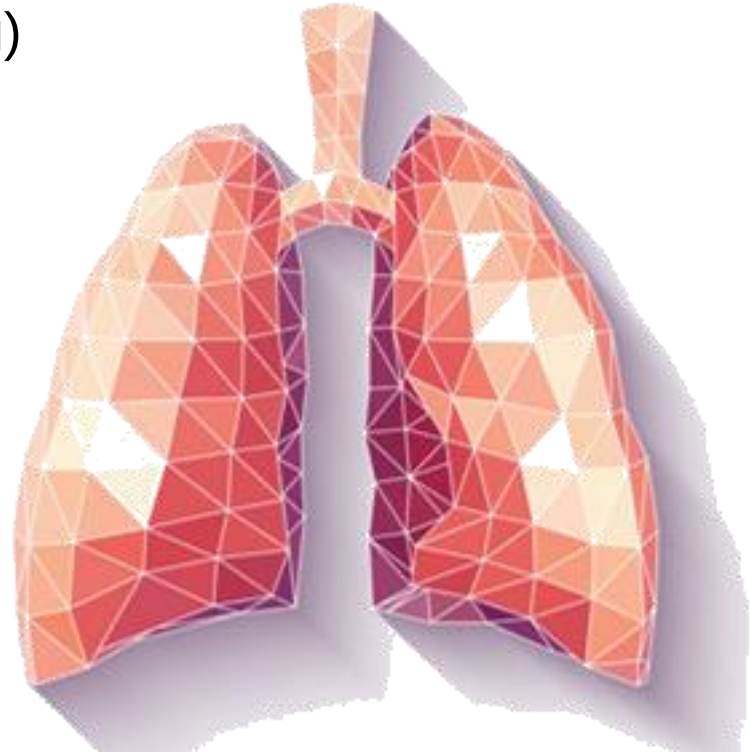
Evaluation for Lung Transplantation

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

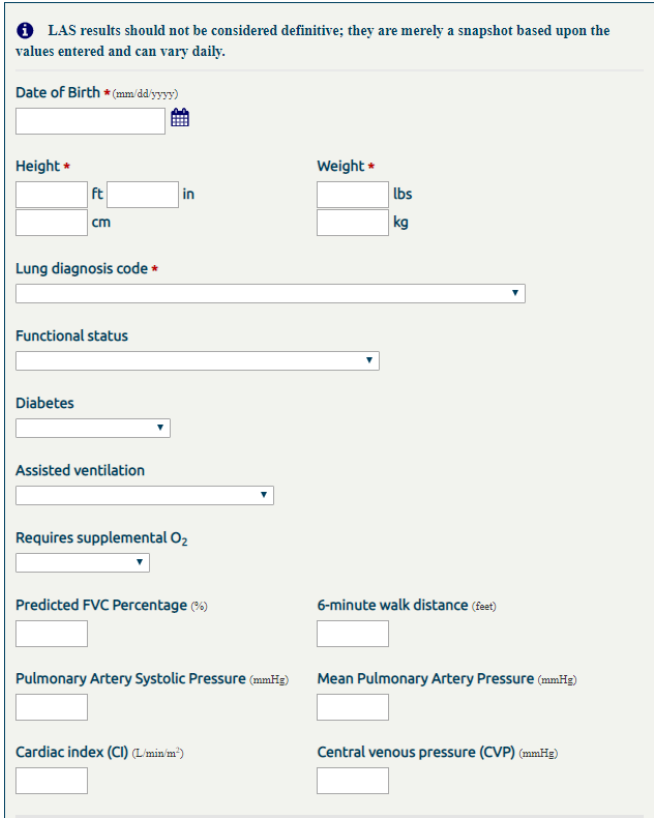


Waitlist

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



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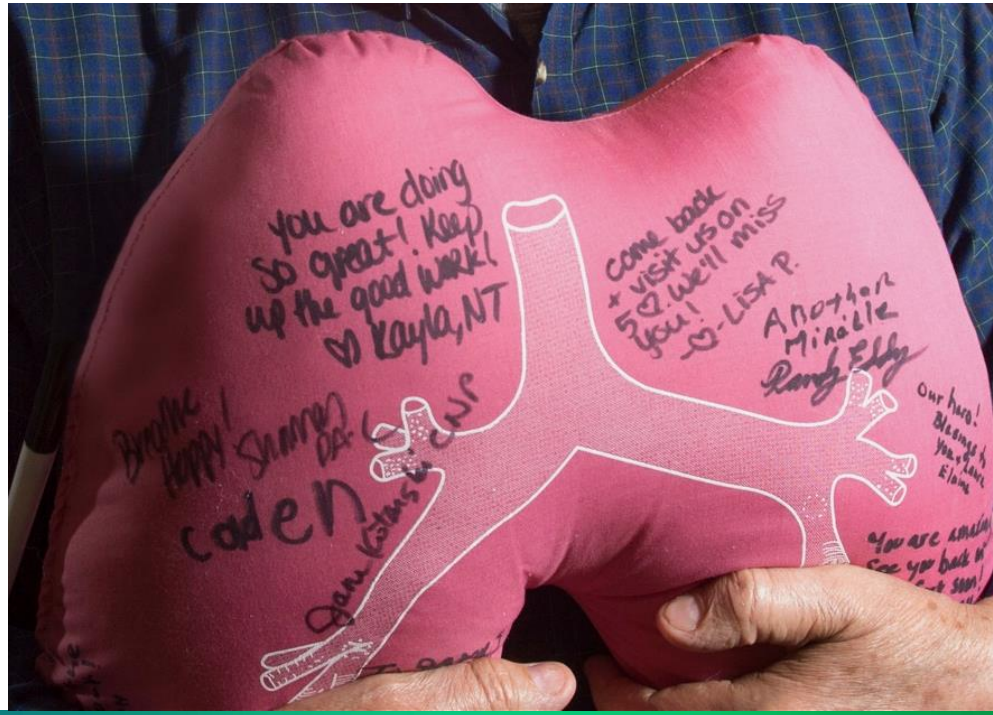
Post Transplant Care (including complications)

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

- **Late:** Rejection, Infection, Malignancies, Organ dysfunction (kidney)



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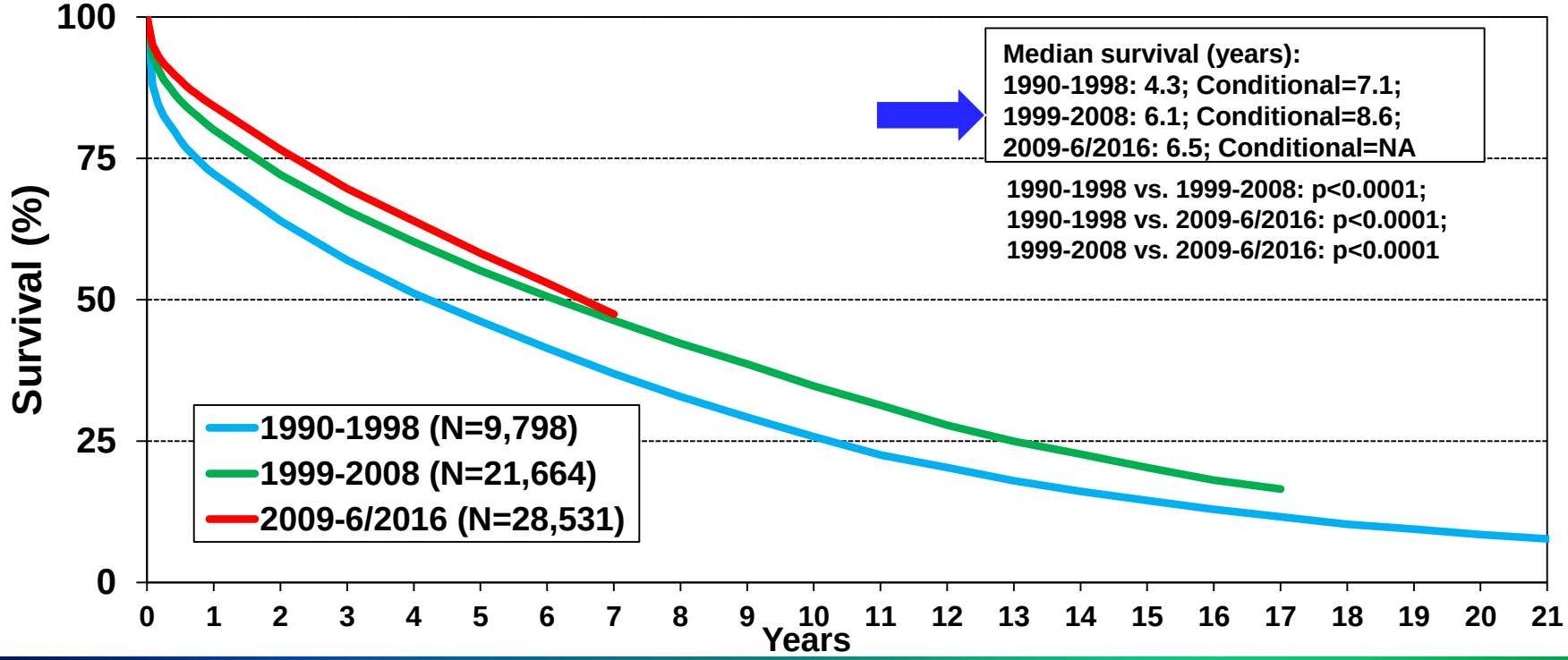
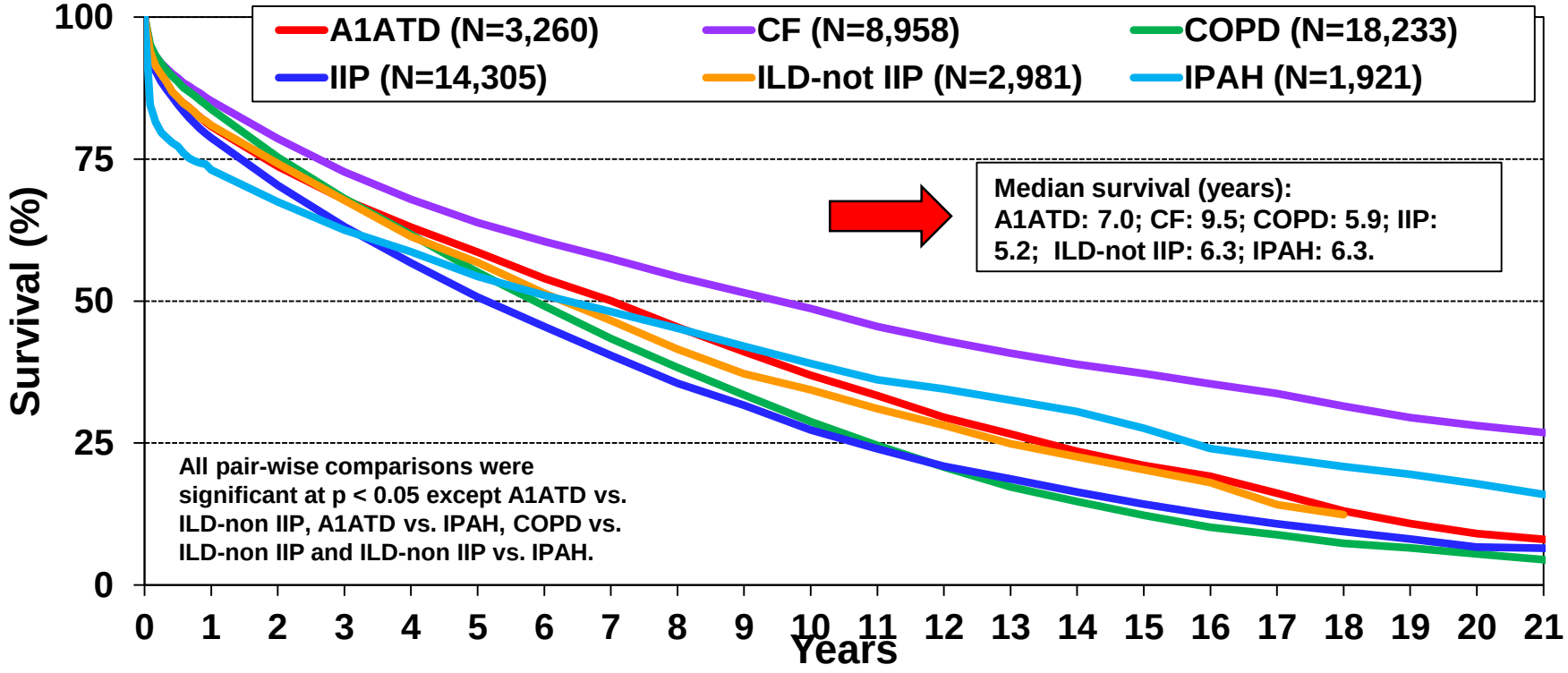
Adult Lung Transplants
Kaplan-Meier Survival by Era
(Transplants: January 1990 – June 2016)



Adult Lung Transplants

Kaplan-Meier Survival by Major Diagnosis

(Transplants: January 1990 – June 2016)

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