LUNG TRANSPLANTATION 2014

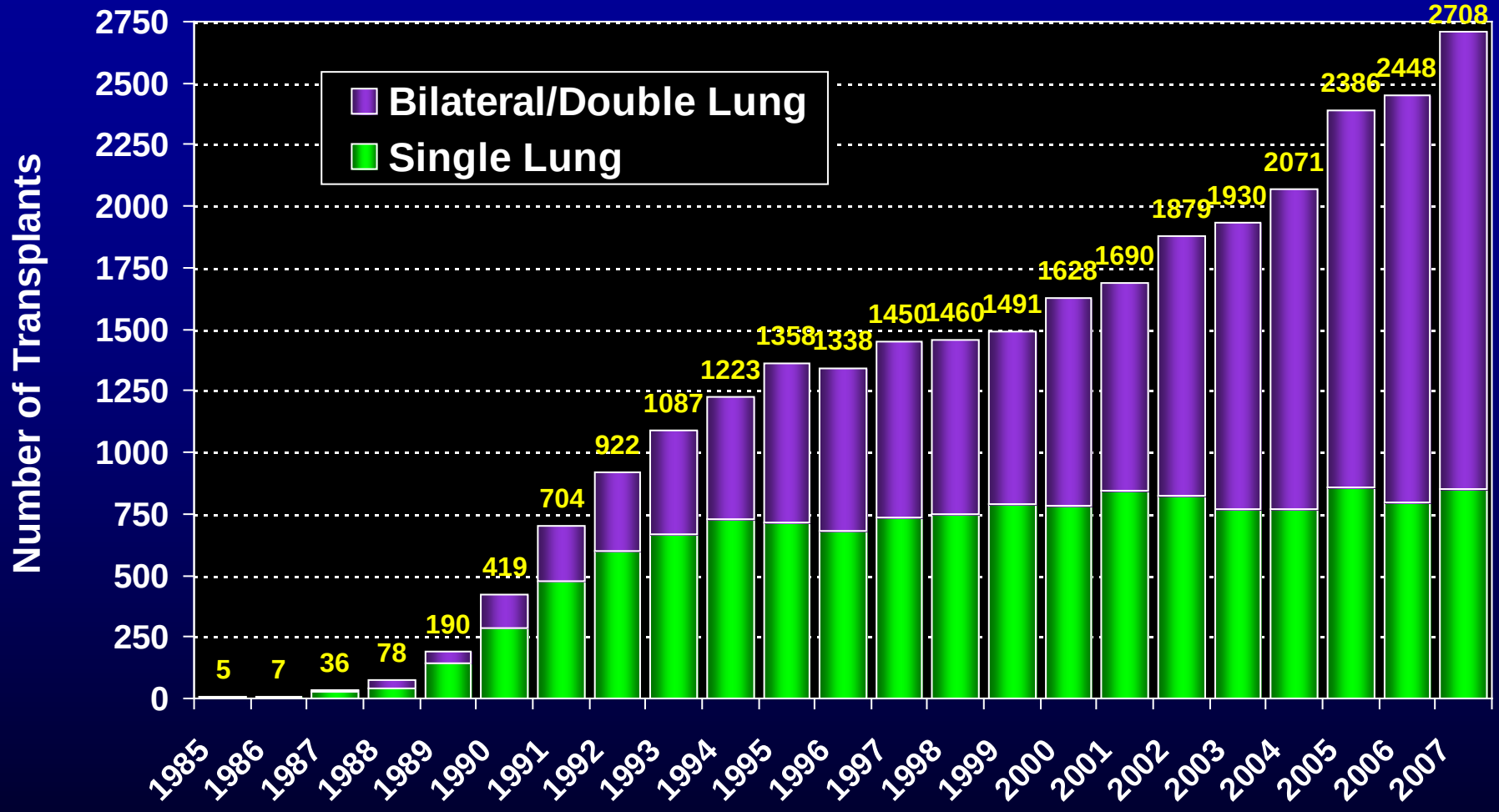
Michael J. Moulton
Professor and Chief
Cardiothoracic Surgery
University of Nebraska Medical Center

History

- Successful SLTx in 1983
- Successful DLTx in 1986
- Joel Cooper, Univ. Toronto

Solid Organ Transplant Survival

NUMBER OF LUNG TRANSPLANTS REPORTED BY YEAR AND PROCEDURE TYPE

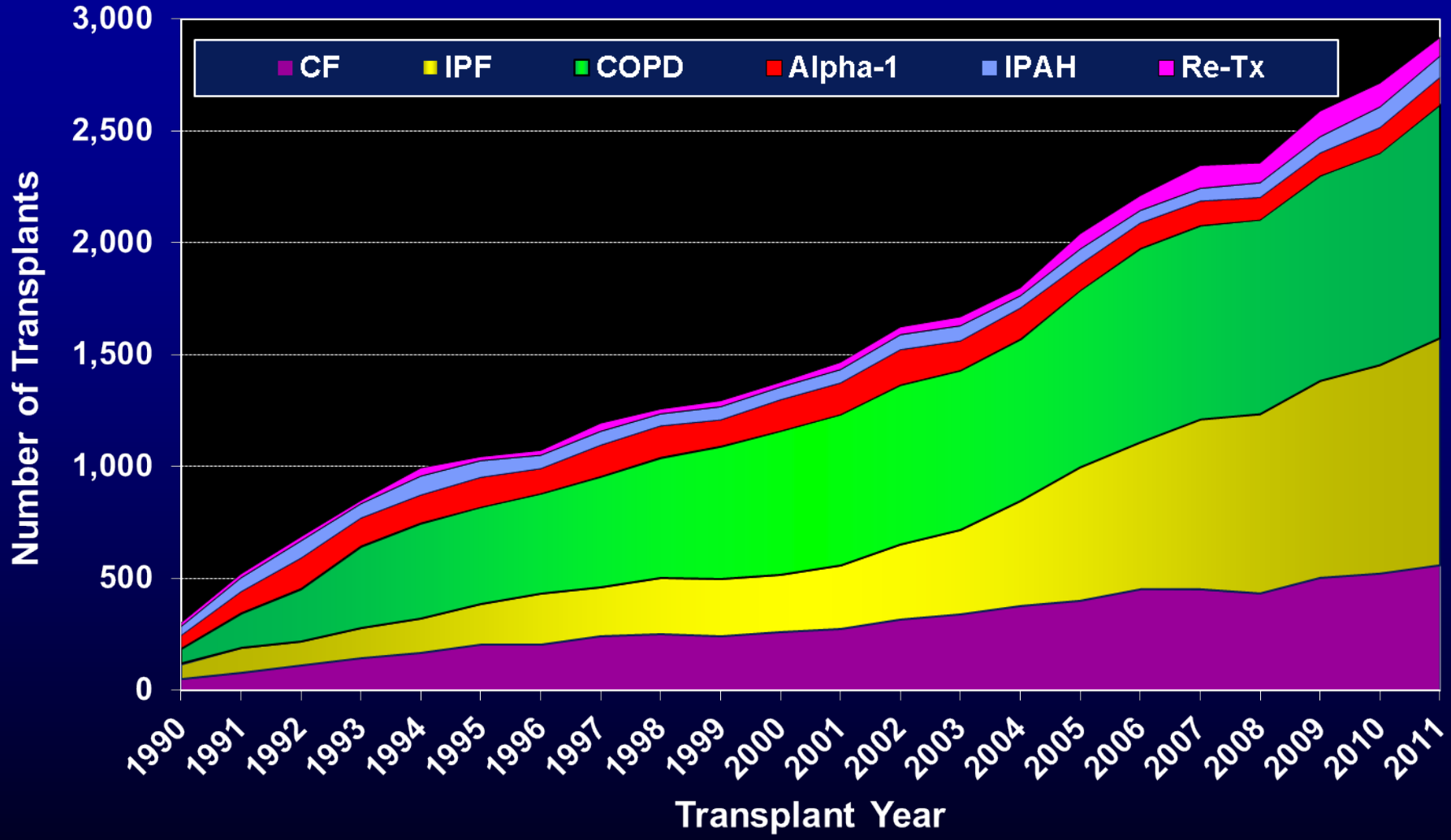


ISHLT

2009

NOTE: This figure includes only the lung transplants that are reported to the ISHLT Transplant Registry. As such, this should not be construed as representing changes in the number of lung transplants performed worldwide.

Adult Lung Transplants
Major Indications By Year (Number)



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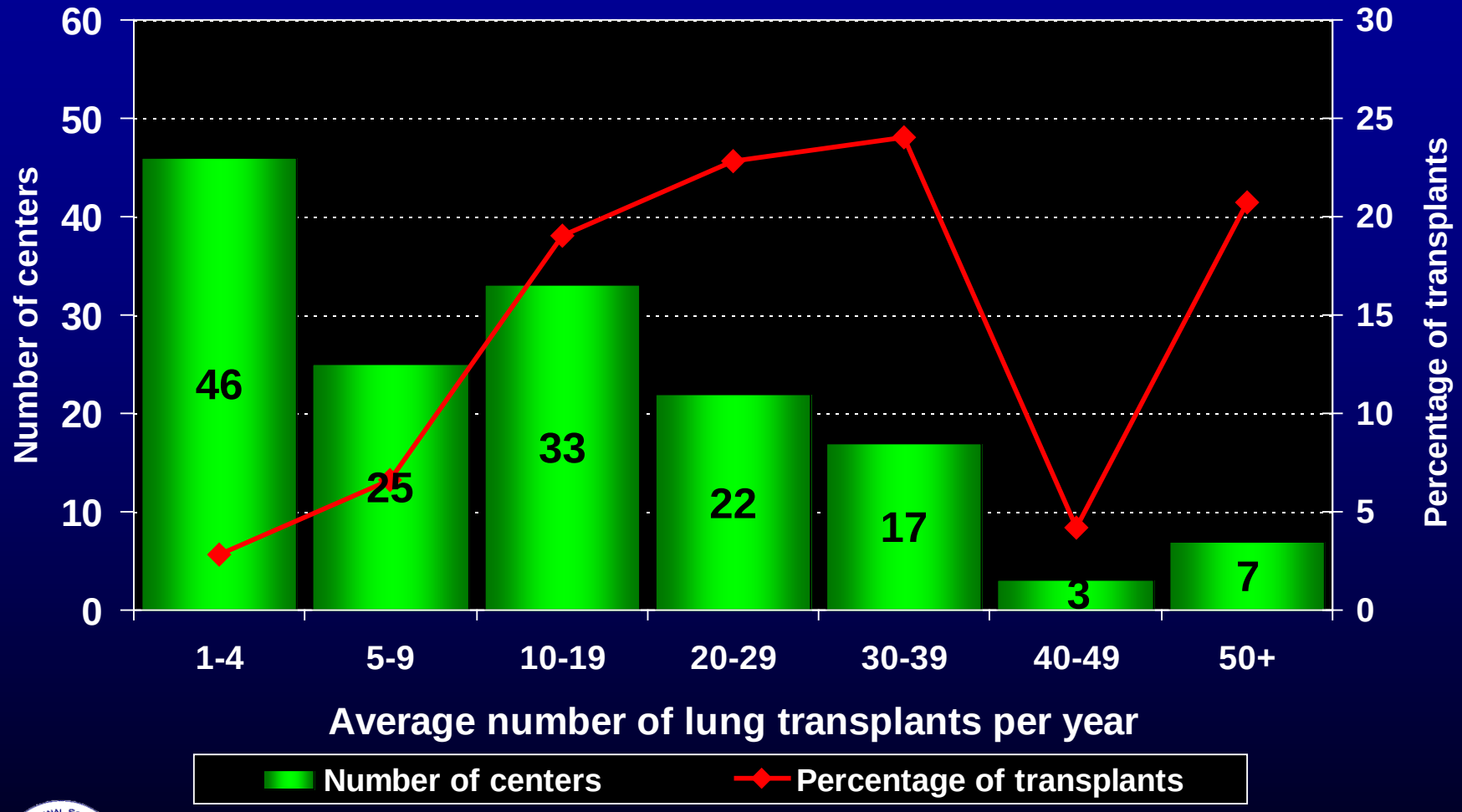
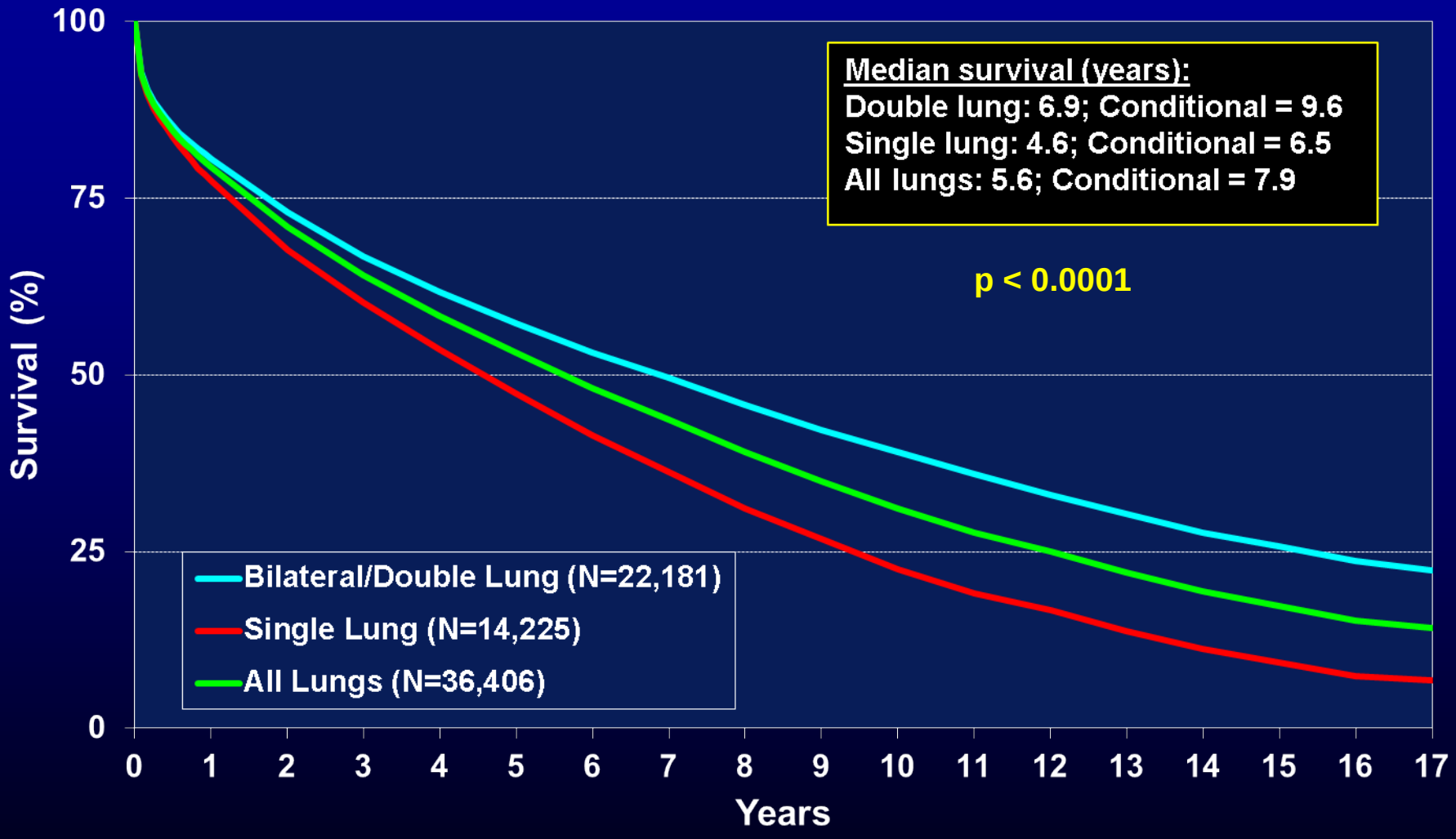
AVERAGE CENTER VOLUME
Lung Transplants: January 1, 2000 - June 30, 2011



ISHLT

2011

Adult Lung Transplants
Kaplan-Meier Survival by Procedure Type
(Transplants: January 1994 – June 2011)



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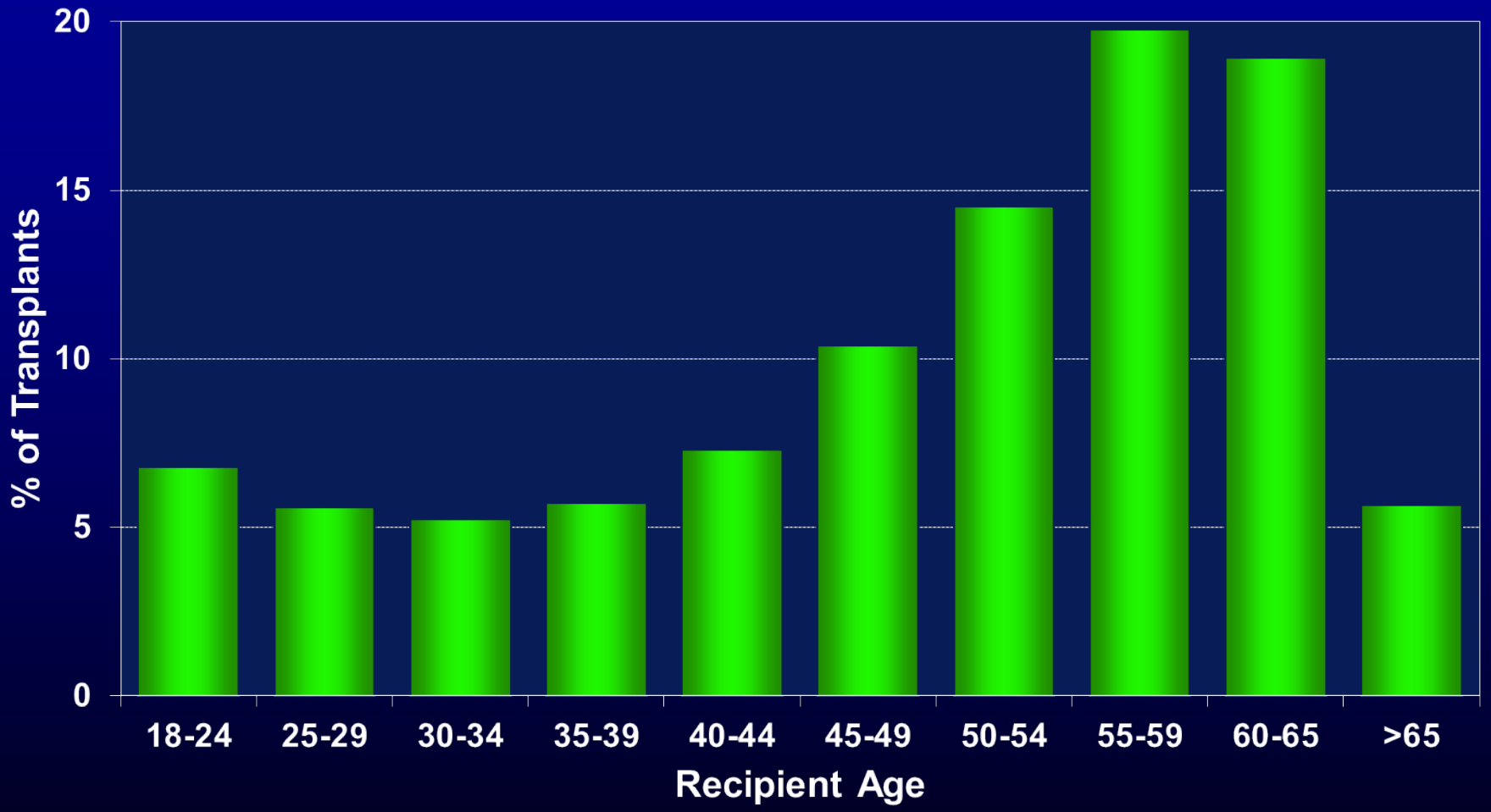
Adult Lung Transplants

Recipient Age Distribution (Transplants: January 1985 – June 2012)



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2013

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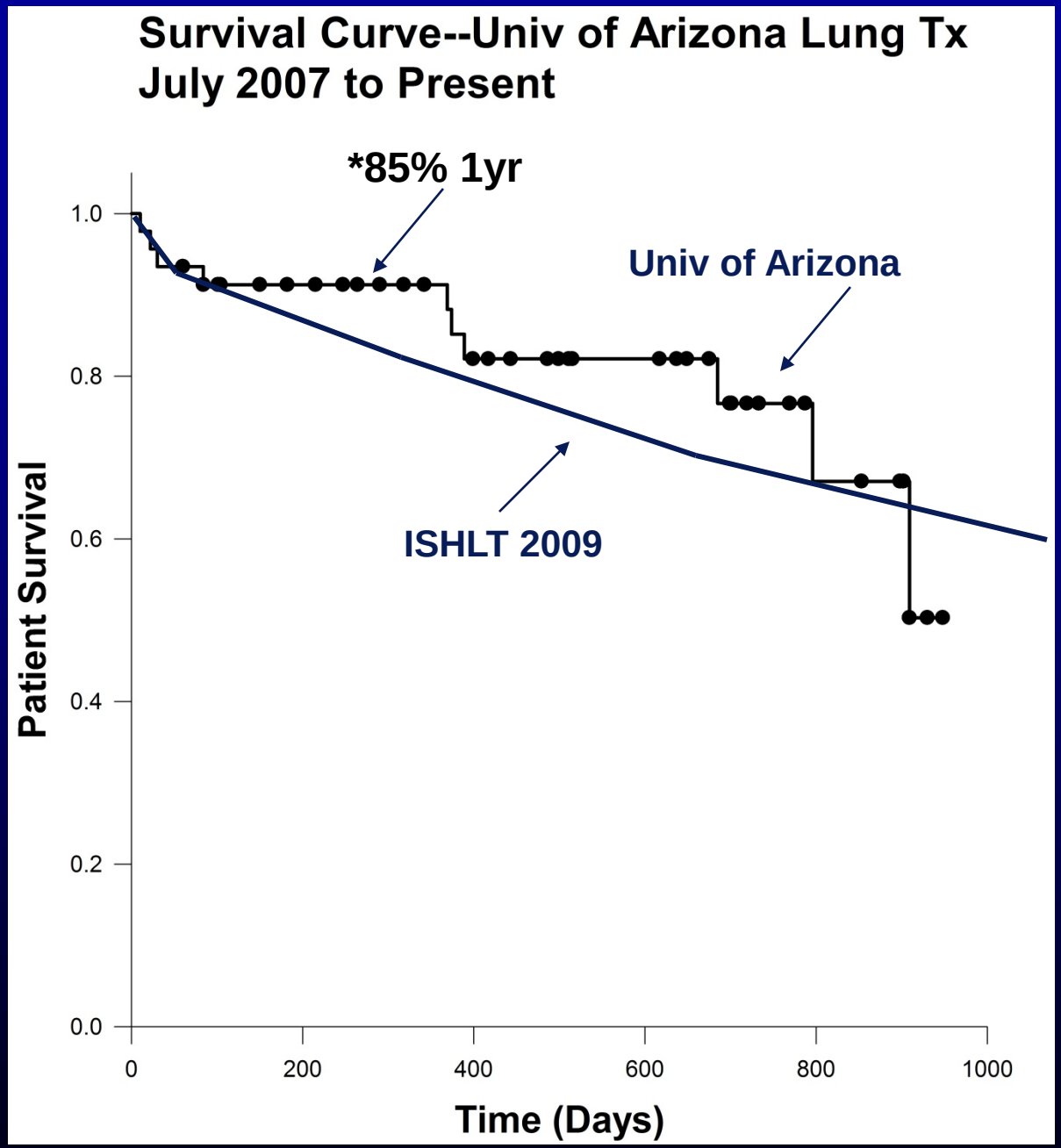
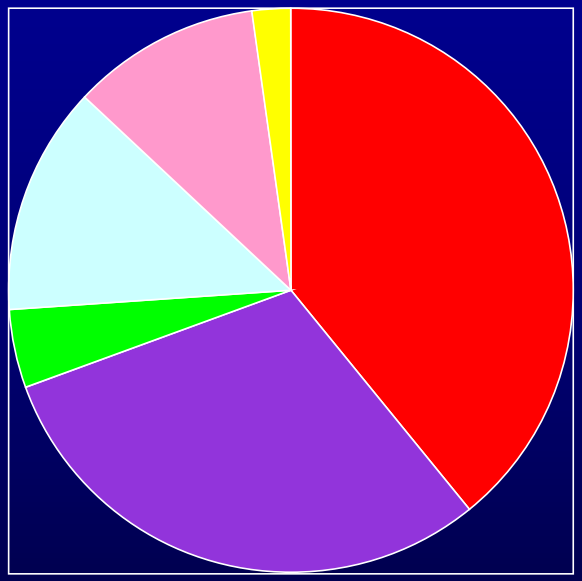
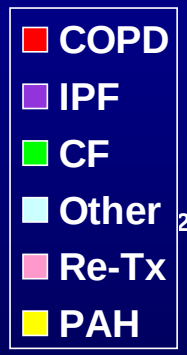
University of Arizona

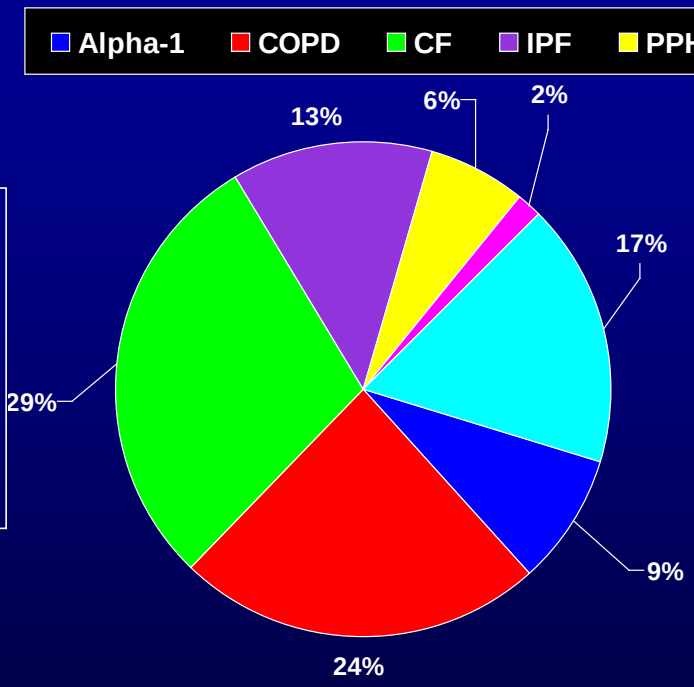
- July 2007 to October 2010
- 56 lung transplants
- 52 bilateral sequential transplants
- 4 single lung transplants
- 5 redo transplants
- 1 year actual survival 85%
- UNOS expected 1 year survival 80%


Survival Curve--Univ of Arizona Lung Tx
July 2007 to Present
*85% 1yr
Univ of Arizona
ISHLT 2009
Patient Survival
1.0
0.8
0.6
0.4
0.2
0.0
0
200
400
600
800
1000
Time (Days)

Type of Transplant



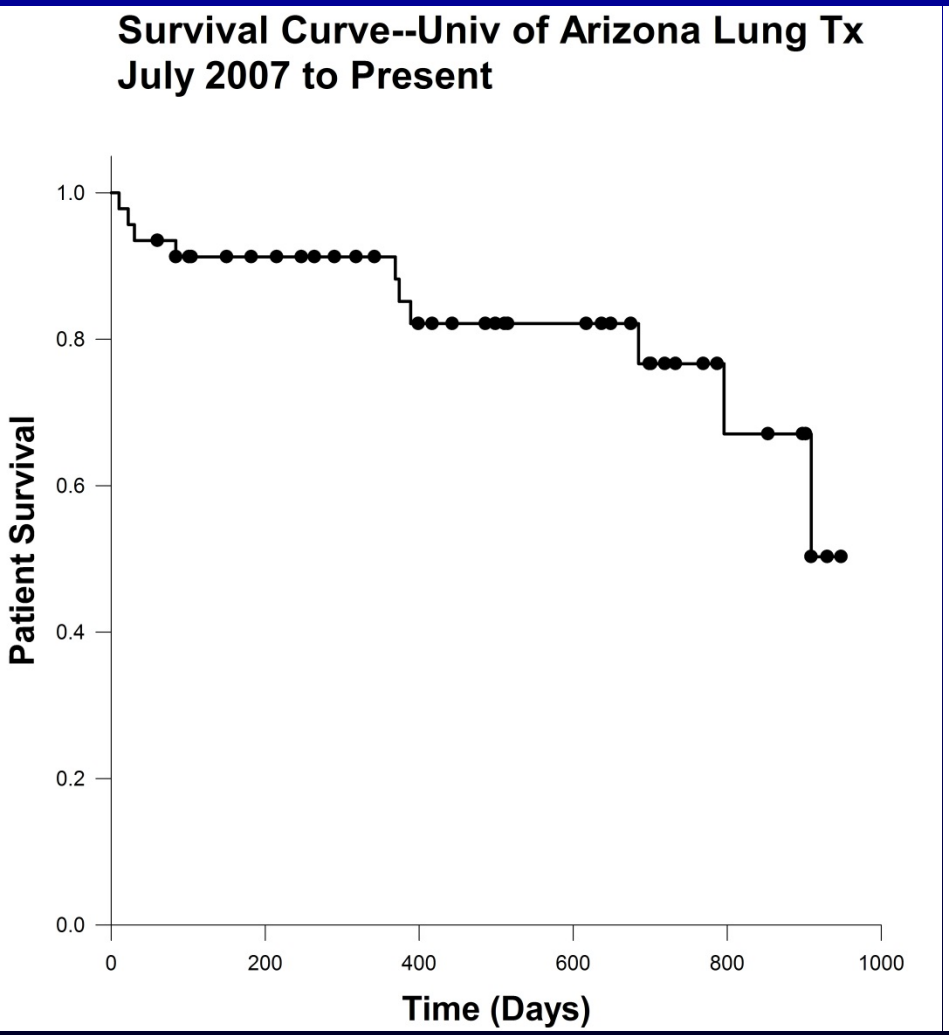




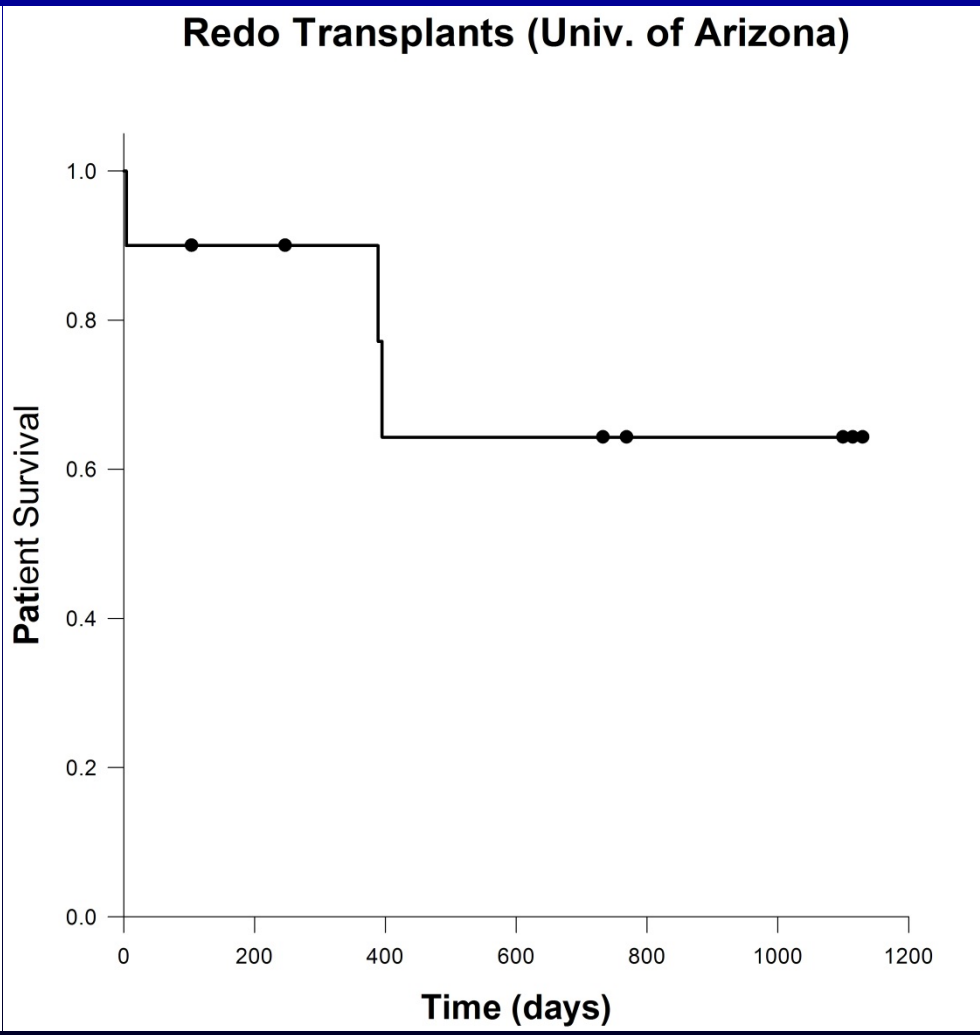
Univ. of Arizona

ISHLT 2013

All Patients (n=56)

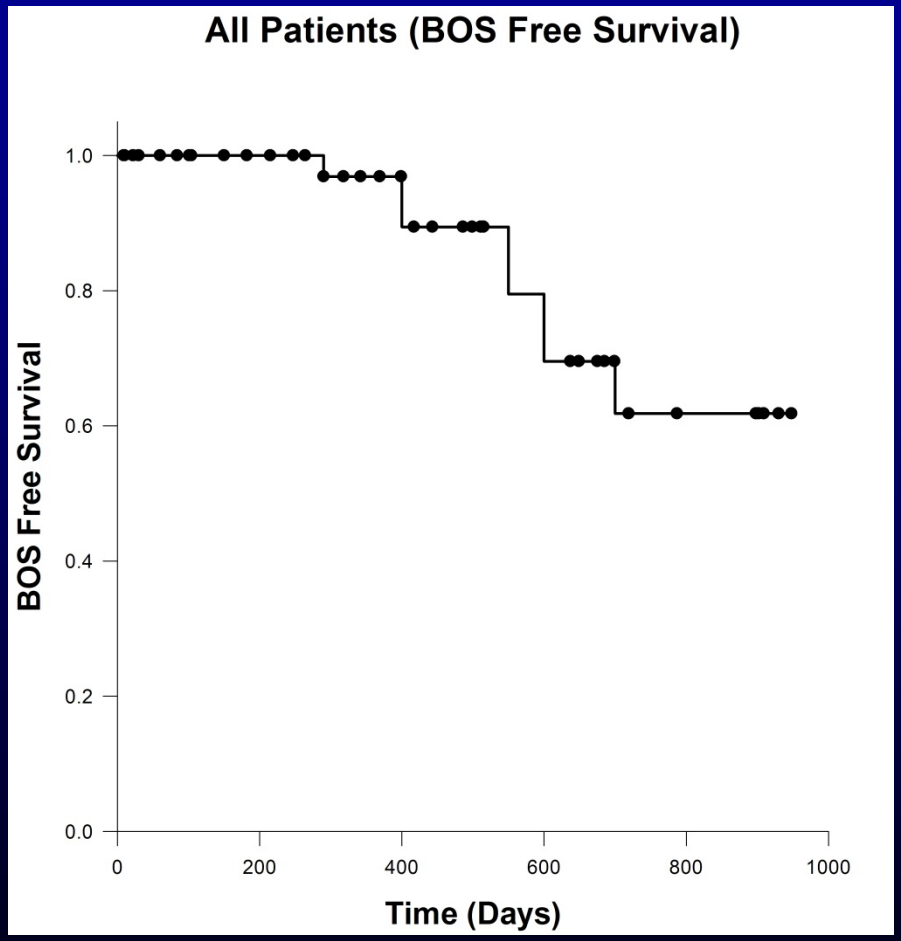


Redo Transplants (n=10)

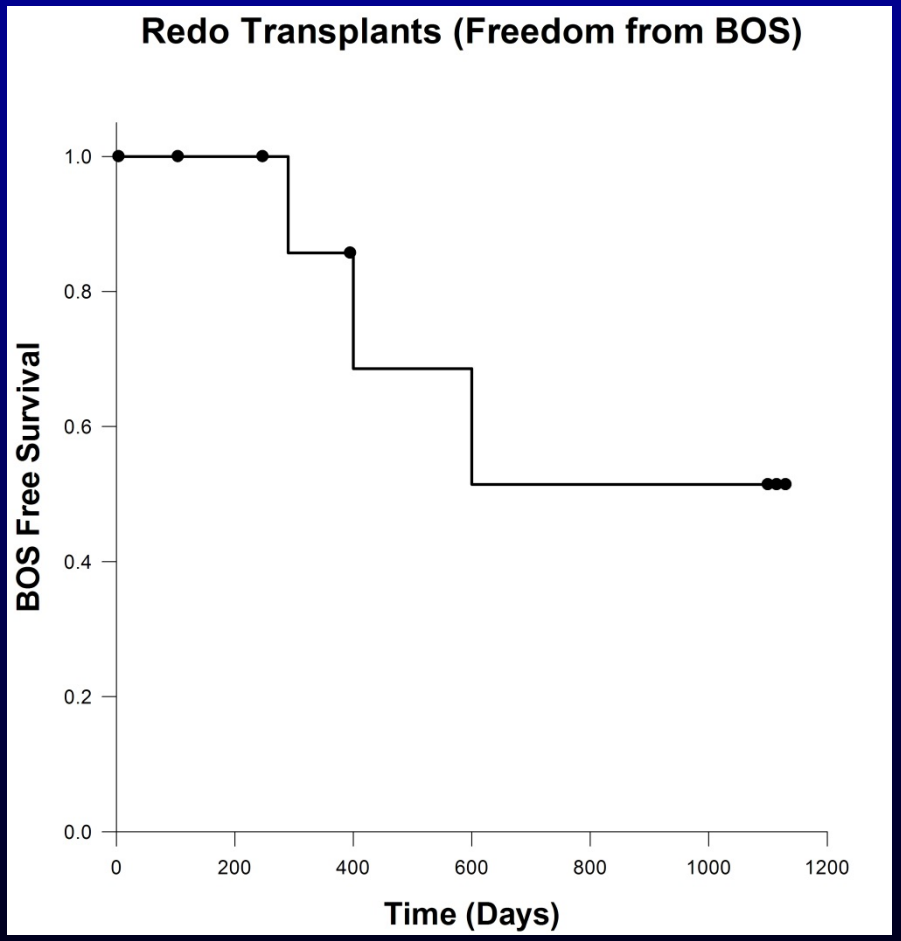


Freedom from BOS (Redo vs. All Transplants)

All Patients (n=56)



Redo Transplants (n=10)



Indications

- International Guidelines for the Selection of Lung Transplant Candidates: 2006 Update—A Consensus Report From the Pulmonary Scientific Council of the International Society for Heart and Lung Transplantation

Indications

- “Lung transplantation is indicated for patients with chronic, end-stage lung disease who are failing maximal medical therapy, or for whom no effective medical therapy exists. Potential candidates should be well informed and demonstrate adequate health behavior and a willingness to adhere to guidelines from health care professionals.”

COPD

Guidelines for Transplantation

- Patients with a BODE index* of 7 to 10 or at least 1 of the following:
- History of hospitalization for exacerbation associated with acute hypercapnia (PCO2 exceeding 50 mm Hg).
- Pulmonary hypertension or cor pulmonale, or both, despite oxygen therapy.
- FEV1 of less than 25% and either DLCO of less than 25% or homogenous distribution of emphysema.

CF/Bronchiectasis

- FEV1 below 30% predicted or a rapid decline in FEV1—in particular in young female patients.
- Exacerbation of pulmonary disease requiring ICU stay.
- Increasing frequency of exacerbations requiring antibiotic therapy.
- Refractory and/or recurrent pneumothorax.
- Recurrent hemoptysis not controlled by embolization.
- Oxygen-dependent respiratory failure.
- Hypercapnia.
- Pulmonary hypertension.

Pulmonary Fibrosis

- Histologic or radiographic evidence of UIP and any of the following:
- A DLCO of less than 40% predicted.
- A 10% or greater decrement in FVC during 6 months of follow-up.
- A decrease in pulse oximetry below 88% during a 6-MWT.
- Honeycombing on HRCT (fibrosis score of 2).
- Histologic evidence of NSIP and any of the following:
- A 10% or greater decrement in FVC or 15% decrease in DLCO during 6 months of follow-up.

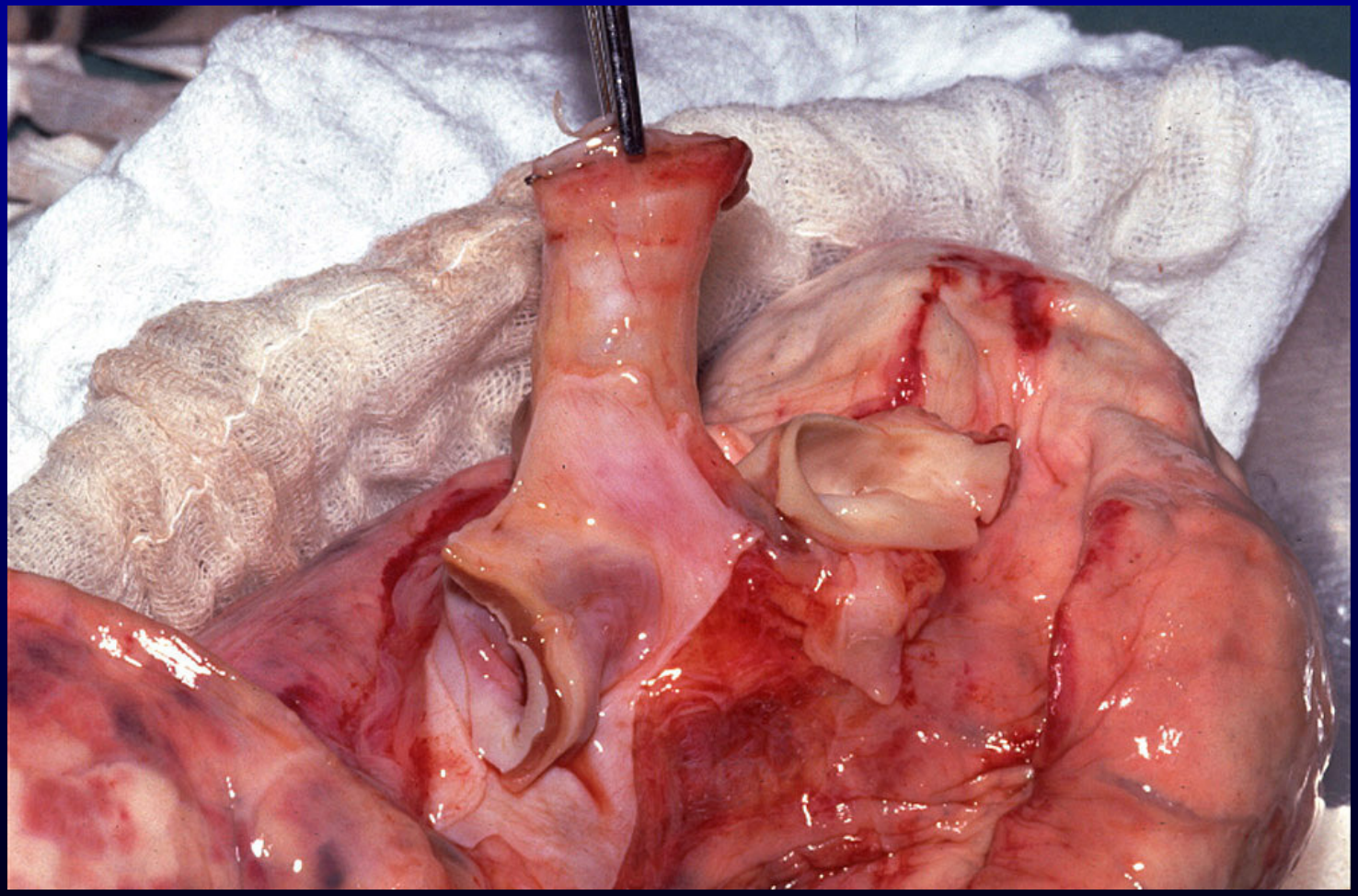
Lung Allocation Score

Table 5: Factors used to calculate LAS when the allocation system was implemented

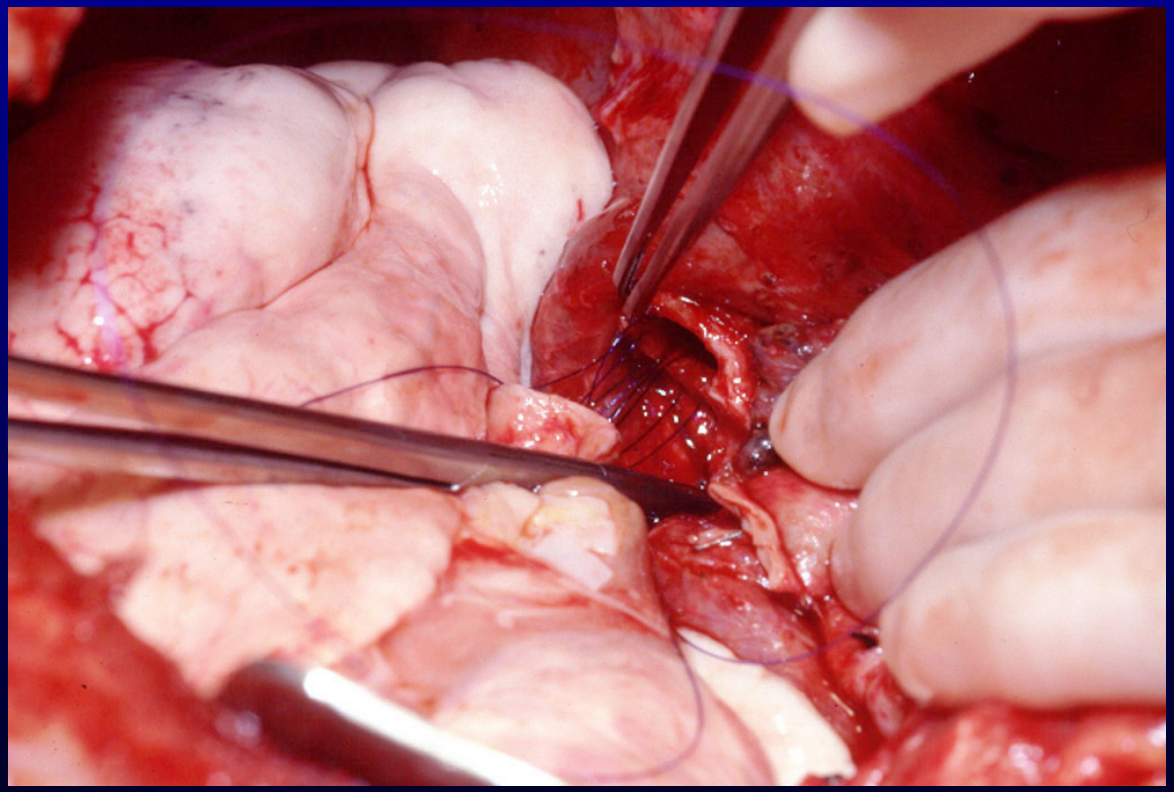
Factors used to predict weight list survival	Factors used to predict posttransplant survival
FVC (% predicted)	FVC (% predicted)
PA systolic pressure	PCW mean pressure ≥ 20 mmHg
O2 required at rest (L/min)	Continuous mechanical ventilation
Age at offer	Age at transplant
Body mass index (BMI)	Serum creatinine (mg/dL)
NYHA functional status	NYHA functional status
Diagnosis	Diagnosis
Six-minute walk distance <150 feet	
Continuous mechanical ventilation	
Diabetes	

Source: SRTR.

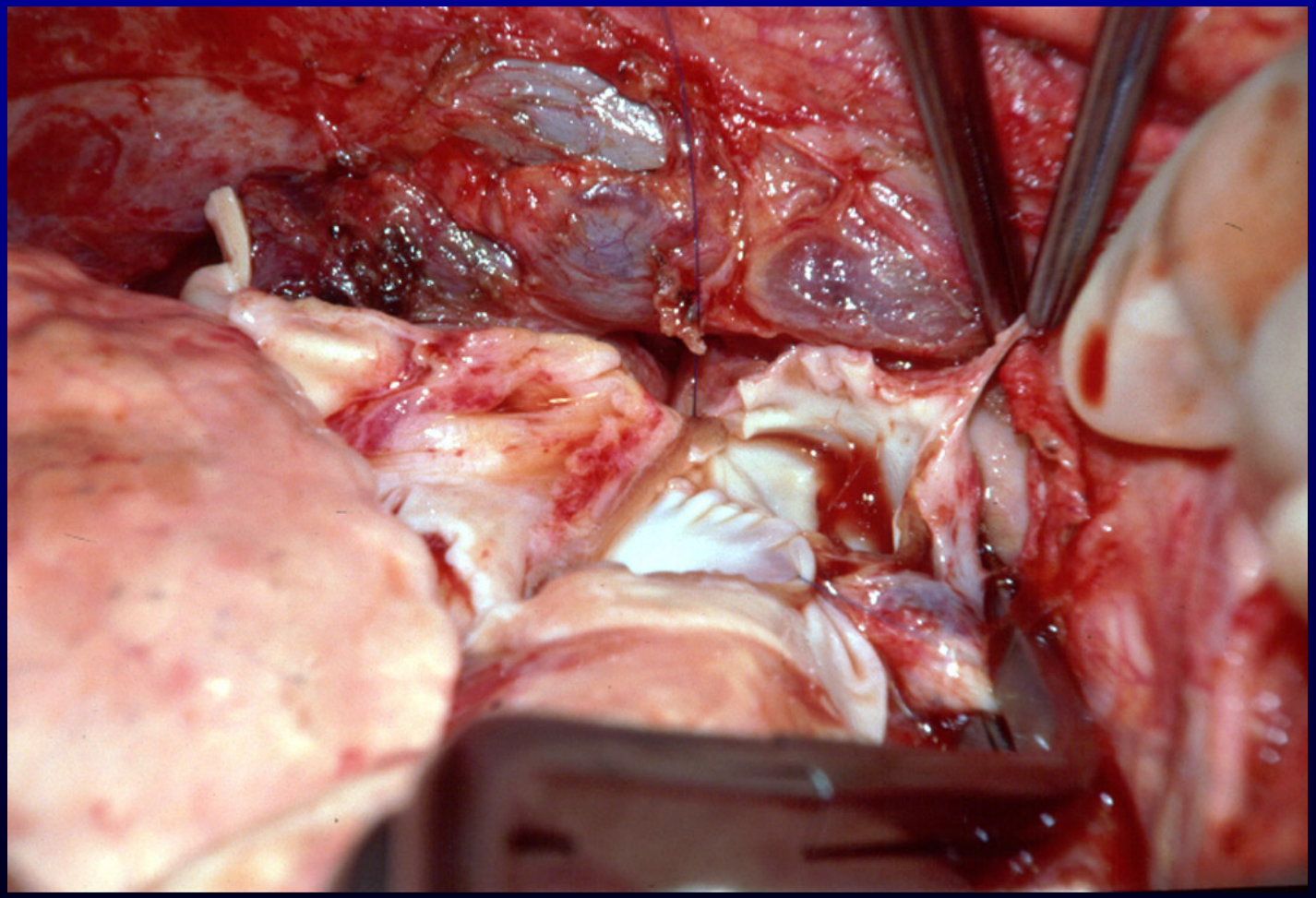
Operation



Operation



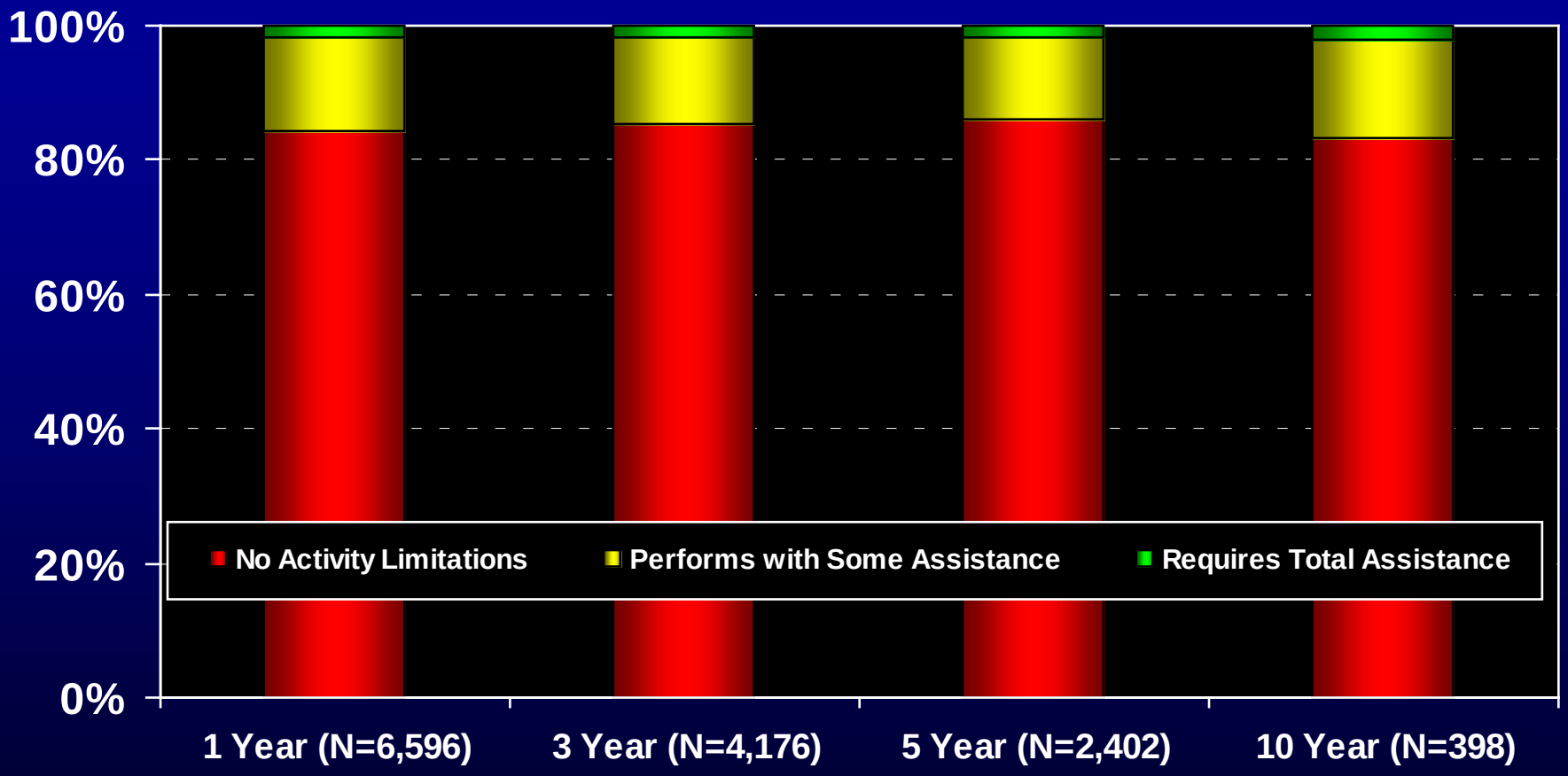
Operation



ADULT LUNG RECIPIENTS

Functional Status of Surviving Recipients

(Follow-ups: April 1994 – June 2011)

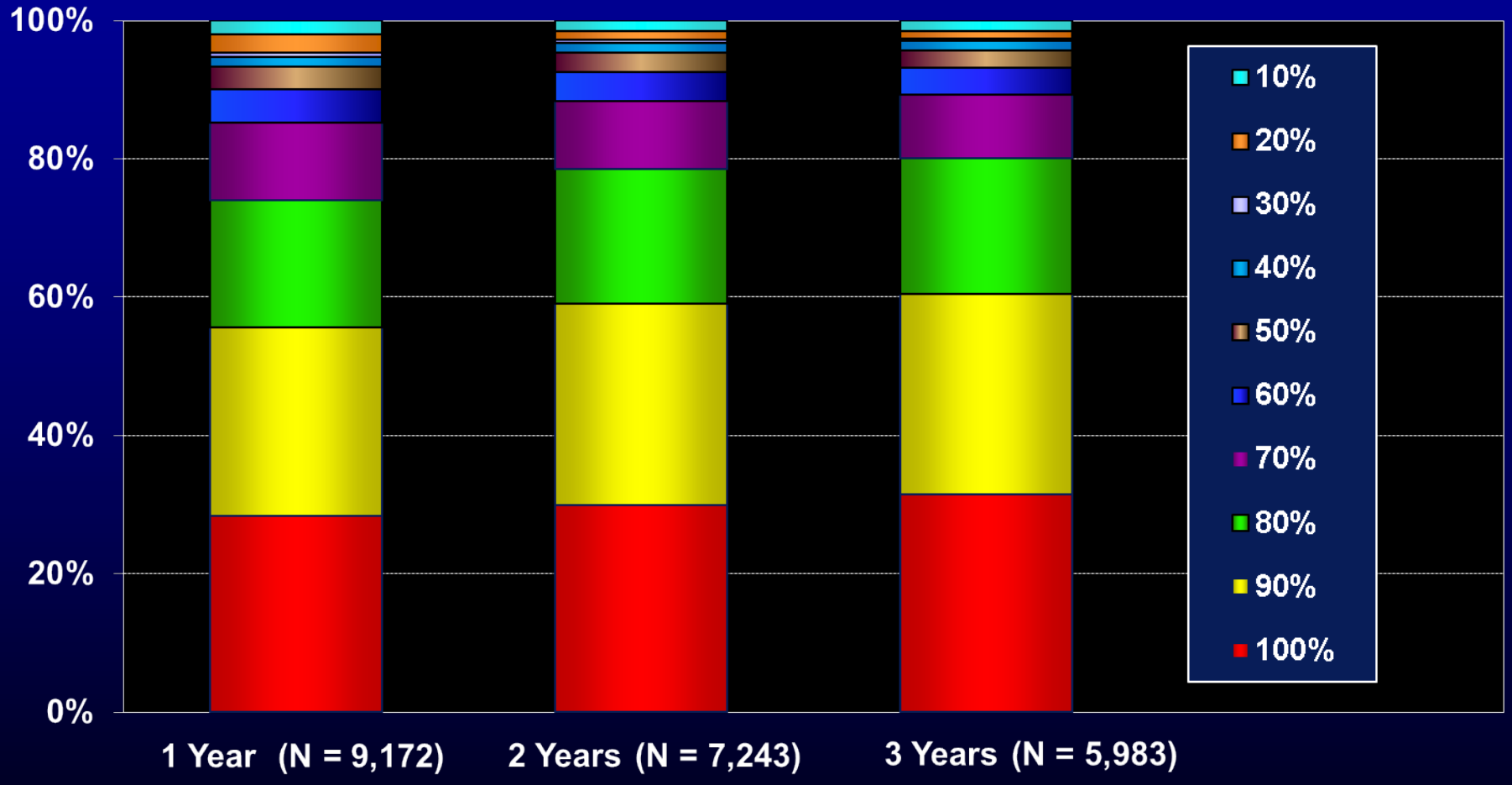


ISHLT

2013

J Heart Lung Transplant 2013;26: 782-795

Adult Lung Transplants
Functional Status of Surviving Recipients
(Follow-ups: March 2005 – June 2012)



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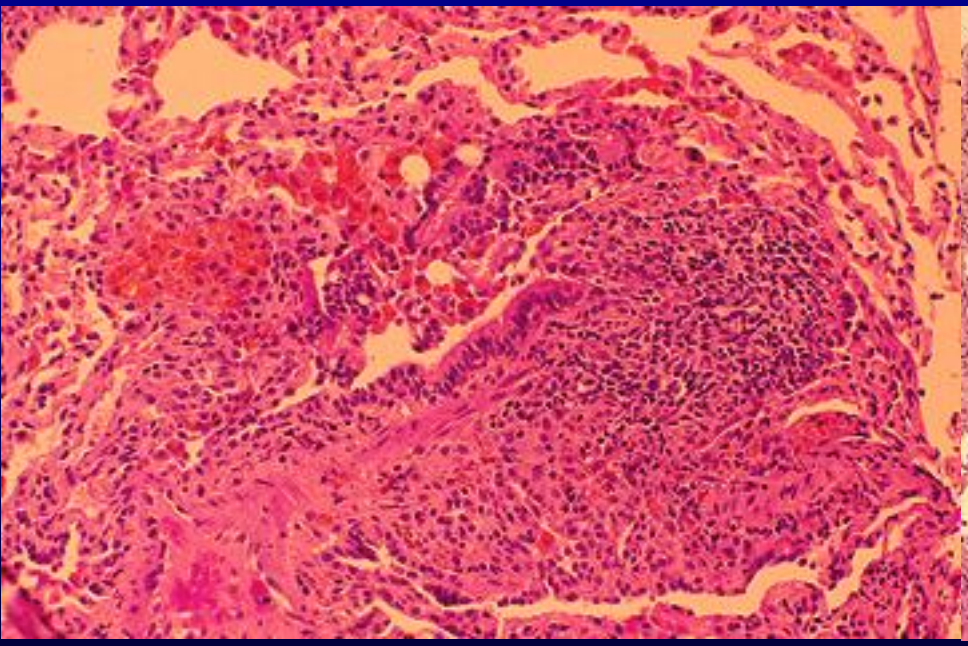
Bronchiolitis Obliterans

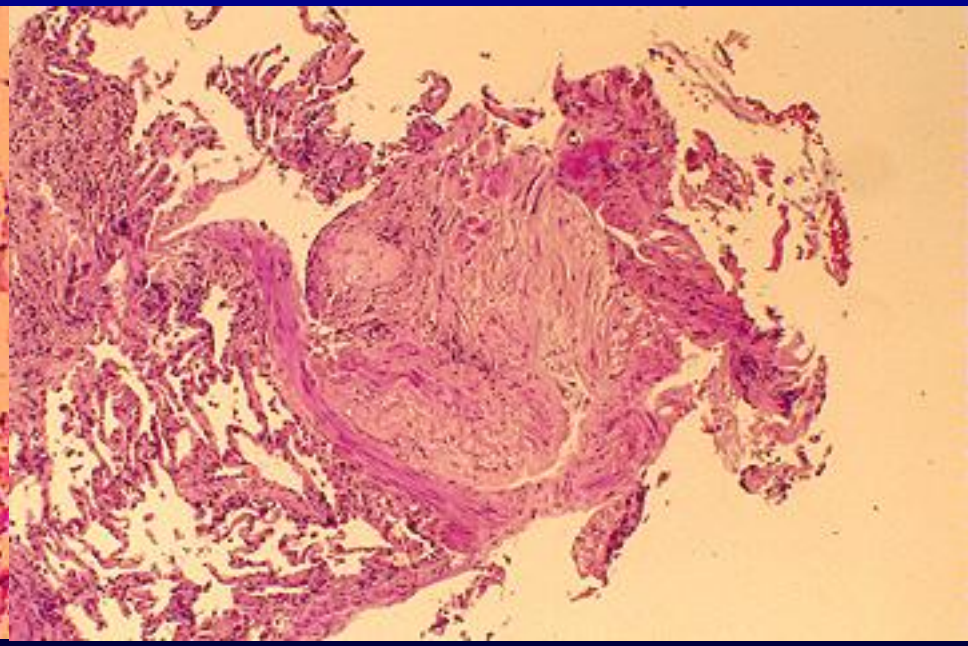
- BOS is also defined as
- irreversible decline in FEV1 of at least 20% of the predicted baseline value, and, according to the 1993 staging system of the International Society of Heart and Lung Transplantation (ISHLT), it is graded as

- BOS stage 1, FEV1 between 66 and 80% of the baseline;
  BOS stage 2, FEV1 between 51 and 65% of the baseline; and
- BOS stage 3, FEV1 between 0 and 50% of the baseline.

OB



Early



Late

Etiology--BOS

- Acute rejection—Antigen dependent factors
- Alloantigen-independent factors
  - Infections-fungal/CMV
  - Airway ischemia
  - Gastric aspiration

‘response to injury’ suggests that injury induces a stereotyped injury response that promotes immune recognition.

Treatment

- Modification of immunosuppression therapy
- Immune modulation therapies
- Macrolides
- Statins
- Fundoplication
- Retransplantation

Summary

- Lung transplant is effective therapy for those with end stage lung disease
- However, the development of BOS in a high proportion of patients limits the long-term benefit