

Association of Operative Day of Week with Outcomes After Lung Transplantation

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Introduction

Lung transplantation is frequently performed during weekends or off hours

Safety of lung transplants performed during the weekends compared to those performed during the week are unknown

We sought to characterize the short-term outcomes and long-term survival of weekend lung transplantation

We hypothesized that lung transplants performed during weekends have worse outcomes than those performed during weekdays

Objectives

Analyze the short-term (30 day) and long-term (10-year) outcomes among patients who receive lung transplants during weekends

Compare weekend lung transplant outcomes to transplants performed during the week

Identify factors associated with short and long-term outcomes among patients who receive transplants during the weekend versus weekdays

Materials and Methods

We queried the Scientific Registry of Transplant Recipients (SRTR) national database for all lung transplants that occurred in the United States between 1987 and 2019

Recipients were stratified by whether they received their transplant during the weekday (Monday through Friday afternoon) versus weekend (Friday evening through Sunday night)

Baseline donor and recipient characteristics, and outcomes were compared between groups

The **primary outcomes** were 10-year overall patient survival, overall graft survival, and death-censored graft survival. **Secondary outcomes** included post-operative complications, length of stay, readmission, and rejection within the first year of transplant

Results

Of the 38,963 lung transplants performed in the United States between 1987 and 2019, 10286 (36%) were performed during the weekend and 28,677 (64%) were performed during the week

Recipients transplanted during the weekend were slightly older (50.6 years vs. 49.9 years, p=0.0002), more likely to be male (57.8% vs 55.2%, p=0.006), and spent less time on the wait list (100 days vs 105 days, p=0.0008)

There were no significant differences in donor characteristics

There was no significant association between weekend transplant and 10-year overall patient survival, allograft survival, or death-censored graft survival in the adjusted analysis. (HR 1.0, (95% CI 0.99-1.01), 1.01 (95% CI 0.99-1.02), 1.0)

No significant association was noted between weekend transplant and length of stay, renal dysfunction, stroke, or rejection within the first year

Characteristic	Weekend 10,286 (36%)	Weekday 28,677 (64%)	P-value
Age	50.6	49.9	0.0002
Gender Female	43.2%	44.8%	0.006
Race			0.73
-White	8744 (85)	24179 (84.3)	
-Black	771 (7.5)	2294 (8.0)	
-American Indian or Alaskan	39 (0.4)	90 (0.31)	
-Asian			
-Native Hawaiian	135 (1.3)	400 (1.4)	
-Hispanic/Latino	7 (0.07)	24 (0.08)	
	567 (5.5)	1623 (5.7)	
BMI	24.4	23.3	0.14
Diagnosis of ESLD			0.67
-CF	1359 (13.2)	3955 (13.8)	
-ILD	2908 (28.3)	7642 (26.7)	
-COPD	2723 (26.5)	7628 (26.6)	
Diabetes (yes)	222 (8.4)	727 (9.3)	0.53
HTN	1461 (22.1%)	4075 (21.9%)	0.966
On IS or anti-viral therapy (No)	1223 (16.8%)	3342 (16.2%)	0.092
Prior lung txp (Y)	384 (3.7)	1086 (3.79)	0.806
COPD treatment (Yes)	1568 (56.1%)	4559 (55.2%)	0.185
Dialysis (yes)	39 (0.4%)	128 (0.47%)	0.251
Steroids	4509 (46.5)	12540 (46.4)	0.115
Cigarette > 20py (yes)	1385 (14.2)	3839 (4.4)	0.232
Recip pCO2	47.4	47.5	0.4314
Cr	0.87	0.87	0.91
Life support	920 (9.04)	2612 (9.2)	0.627

Table 1 – Baseline Characteristics By Weekend versus Weekday Transplant

Pretransplant Pulmonary Variables	Weekend 10,286 (36%)	Weekday 28,677 (64%)	P-value
O2 req, median	3 (2-5)	3 (2-5)	0.15
6 min walk test, mean (SD), f	850 (492-1150)	820 (450-1120)	0.0011
FEV1, %	37	36.8	0.50
FVC, %	48.6	49.0	0.042
Vent dependent	581 (5.6)	1660 (5.8)	0.6
Rec cardiac output	5.3L/M	5.3 L/M	0.6990
Total Ischemic time, median	267 210-330	264 (207-332)	0.068
ECMO	260 (2.53)	717 (2.5)	0.88
Donor age	32.9	32.8	0.6257
Donor gender (F)	3991 (38.8)	11222 (39.1)	0.554
Donor race			0.001
-White	6665 (64.8)	18997 (66.2)	
-Black	1864 (18.1)	5008 (17.5)	
-American Indian or Alaskan	44 (0.4)	108 (0.38)	
-Asian			
-Native Hawaiian	215 (2.09)	699 (2.44)	
-Hispanic/Latino	21 (0.2)	64 (0.22)	
	1452 (14.1)	3742 (13.1)	
Donor Cr	1.3	1.3	0.69
Donor HTN	2040 (21.1%)	5391 (20.3%)	0.096
Cigarette	1135 (53.0%)	3212 (53.6)	0.795
Donor DM (yes)	588 (6.04)	1523 (5.71)	0.294
Donor ionotropic support	4439 (44.2)	12447 (45.1)	0.006
Days on waiting list (median (IQR))	100 (25-305)	105 (28-315)	0.0008

Table 2 – Pre-transplant Characteristics By Weekend versus Weekday Transplant

Post op stroke	215 (2.2)	592 (2.2)	0.547
Post op dialysis	611 (6.3)	1699 (6.3)	0.71
Reoperation	210 (3.2)	638 (3.5)	0.09
Rejection with drug	598 (24.5)	1908 (26.0)	0.12
Hospital LOS (days)	25.8	26.6	0.13

Table 3 – Secondary Outcomes By Weekend versus Weekday Transplant

Outcomes for lung transplantation in the USA are not affected by day of surgery

Weekends do not confer an increased risk for mortality, graft failure/rejection, or post-operative complications