

LUNG TRANSPLANTS - Data CYE 2005- CYE 2008

**LUNG**

**AHCCCS Data for Cases Members >21 years**

	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>
Listed During year	10	16	18	8
# listed Dual or TPL	Unknown	None	None	4
Total Members on Wait list for organ	1 single lung (SL); 10 double lung (DLL)	13 DLL	14 DLL	3 SL; 5 DLL
Transplanted	1 SL; 2 DLL	6 DLL	4 DLL	4 SL; 1 DLL
Mortality	1 in 2007	0	0	2 expired while waiting
Approved Costs for Components during contract year	<b>\$463,818.00</b>	<b>\$1,199,920.35</b>	<b>\$717,184.00</b>	<b>\$1,052,139.00</b>

Note- 2005 a transplant log of all members was not maintained  
Wait listed members may drop off from eligibility

***SUMMARY OF FINDINGS:***

***Criteria for listing:***

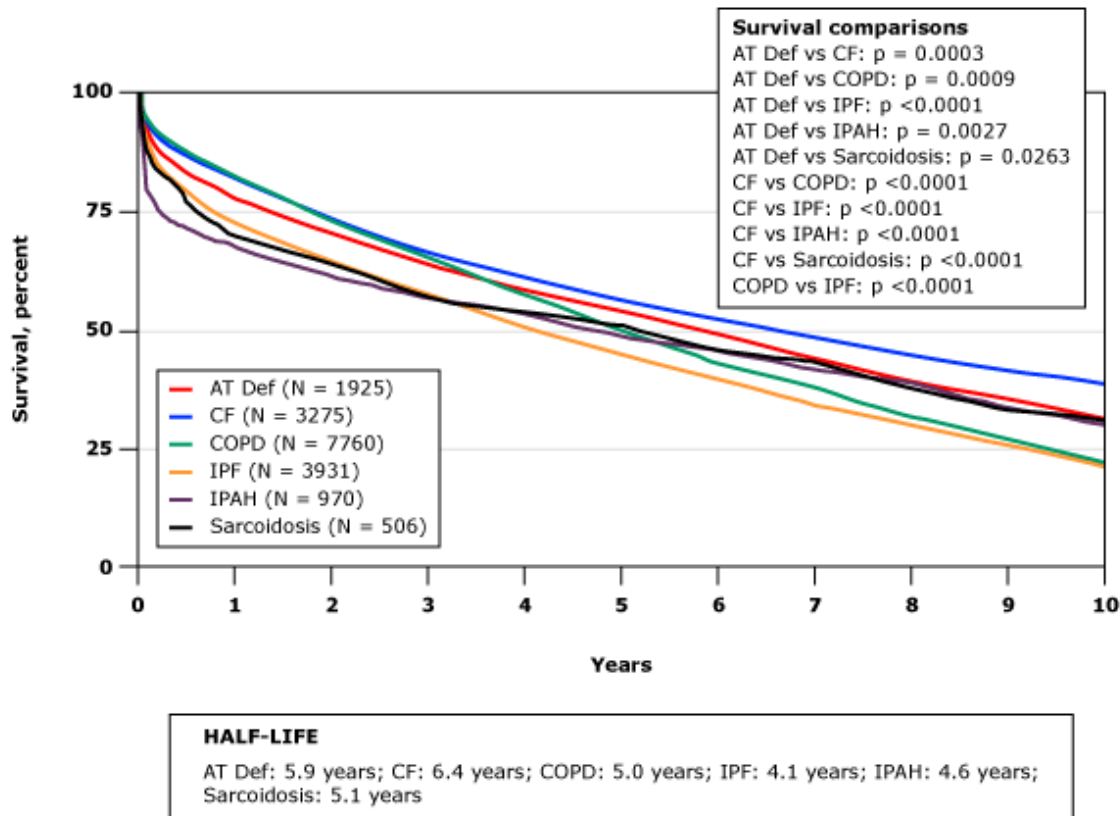
The Pulmonary Scientific council of the International Society for Heart and Lung Transplantation (ISHLT) issued guidance for lung transplants in 2006 stating that, “lung transplantation is indicated for patients with chronic, end-stage lung disease who are failing maximal medical therapy, or for whom no effective medical therapy exists...The primary goal is to provide a survival benefit, particularly in patients with advanced cystic fibrosis, idiopathic pulmonary fibrosis, and primary pulmonary hypertension.” (1)

***Mortality and Morbidity:***

According to the 2007 Registry report, the median survival for all adult recipients is five years, but bilateral lung recipients appear to have a better median survival than single lung recipients (5.9 versus 4.4 years, respectively). However, it is unclear if this survival advantage is directly related to the type of operation or to the underlying recipient characteristics.

Adverse predictors of survival in patients who have lung transplants are lengthy and have been evaluated extensively based on diagnosis.

**Kaplan-Meier survival by diagnosis for adult lung transplants performed between January 1990 and June 2006**



AT Def:  $\alpha_1$ -anti-trypsin deficiency emphysema; COPD: chronic obstructive pulmonary disease; IPF: idiopathic pulmonary fibrosis; IPAH: idiopathic pulmonary arterial hypertension; CF: cystic fibrosis.

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**Causes of death:**

Graft failure, a form of ARDS/diffuse alveolar damage (DAD), which occurs in the early hours to days after transplant, is the leading cause of death in the first 30 days after transplantation, accounting for almost 30 percent of deaths.

Chronic allograft rejection or chronic graft dysfunction, which manifests as bronchiolitis obliterans syndrome (BOS), is the leading cause of mortality after the first year, accounting for over 40 percent of deaths. This remains the primary obstacle to better long-term outcomes after lung transplantation. The incidence of BOS approaches 50 percent within five years of transplantation. Survival three years after the onset of BOS is only 50 percent, and drops to 30 to 40 percent at five years. Superimposed infections and malignancies due to immunosuppressive therapy often further complicate the course. (2)

### ***Quality Of Life after Transplantation:***

After the postoperative recovery, most recipients are able to resume an unencumbered lifestyle. Over 80 percent report no activity limitations and almost 40 percent of five-year survivors are working at least part-time. Furthermore, multiple studies have documented improved overall and health-related quality of life after lung transplantation. One study showed comparable health-related quality of life results between lung transplant recipients and a normative sample of healthy people, with the exception of the social functioning domain.

Postoperative complications hamper this improvement in quality of life. Recipients who have developed BOS report more physical restrictions and depressive and anxiety symptoms than those who have not and have decrements in health-related quality of life compared to their pre-BOS evaluation. Similarly, infections and episodes of acute rejection have a negative impact on health-related quality of life. Nonetheless, even if the survival advantage itself is modest, the prospect of improving quality of life and quality-adjusted survival is often the motivation for transplantation for many recipients and almost 90 percent of survivors are satisfied with their decision to have a transplant. (2)

Existing studies, conditioned upon survival, show that in general patients with cystic fibrosis have a higher post-transplantation QOL than patients transplanted for other diagnoses. Apparent QOL for survivors wanes with length of time since transplantation and substantially further decreases with bronchiolitis obliterans or other complications that increase the burden of care, such as increasing hypoxemia and declining tolerance for physical activity. Lung transplantation is palliative rather than curative for most patients. Due to the shortage of organs it is not currently possible to support transplantation for the purpose of quality of life reasons. (3)

There is no information that can assist patients who are willing to sacrifice longer survival for improved quality of life. While current survival models for cystic fibrosis can predict whether a patient will likely have an increase or decrease in survival with transplantation, no model can predict which patients will have an increase in QOL sufficient to justify a decrease in survival. (2)

### **Lung Patient Care Cost Analysis of Medical Management or other interventions to Lung Transplant:**

Milliman reports in 2007 that the average cost of a single lung transplant is: \$399,500 while a double lung transplant is \$557,400. Milliman costs for 2008 are as follows:

Single Lung: total cost of \$450,400; \$7,500 for the timeframe of 30 days pre-transplant, \$53,600 for organ procurement, \$256,600 for hospital transplant admission, \$27,900 for physician costs during transplant, \$84,300 for the period of 180 post-transplant admission and \$20,500 for immunosuppressants and other prescriptions.

Double Lung: total cost of \$657,800; \$20,700 for the timeframe of 30 days pre-transplant, \$96,500 for organ procurement, \$344,700 for hospital transplant admission, \$59,300 for physician costs during transplant, \$113,800 for the period of 180 post-transplant admission and \$22,800 for immunosuppressants and other prescriptions.

A relatively small number of studies have examined the cost and the cost-effectiveness of lung transplantation. In a 1995 analysis, the mean charge for lung transplantation was \$164,989 (median, \$152,071). The elements were organ acquisition (16 percent), physician fees (18 percent), and hospital and pharmacy charges (66 percent). The average charges for post-transplantation care were \$16,628 per month during the first six months, \$5440 per month during the second six months, and \$4525 per month after the first year. Medication charges alone frequently exceeded \$1000 per month.

During the same period, the average monthly charge for patients on the transplant waiting list was \$3395 (median, \$2610). The lifetime cost for the care of a lung transplant recipient was projected to be \$424,853, and the incremental cost per quality-adjusted life year gained through lung transplantation was calculated to be \$176,817. The main barriers to better cost-effectiveness were the high cost of postoperative care and the marginal survival benefit.

In the study conducted by the University of Washington, 1996, the following results were reported: Transplantation charges averaged \$164,989 (median, \$152,071). Average monthly charges post-transplant

were \$11,917 in year 1 and \$4,525 thereafter, vs. \$3,395 for waiting-list patients. Post-transplant utility scores were significantly higher than waiting-list scores (0.80 vs. 0.68;  $p < 0.001$ ). Life expectancy was not greater for lung transplant vs. waiting-list patients (5.89 vs. 5.32 years;  $p > 0.05$ ), although quality-adjusted life expectancy did improve significantly. After converting charges to costs, the incremental cost per QALY gained for post-transplant compared with waiting-list patients was \$176,817. The study therefore concluded that lung transplantation is very expensive, although it can substantially improve quality of life. Two-thirds of care costs are incurred after transplantation. The principal barriers to cost-effectiveness at present are the high cost of post-recovery care and marginal gains in life expectancy compared with conservative care. (7)

Thus, lung transplantation is an expensive treatment with perhaps only modest improvements in quality-adjusted survival. Nonetheless, there is no social consensus on the monetary value of a quality-adjusted life year gained through lung transplantation or any other treatment. (2, 8)

**AHCCCS Experience with Single Lung Transplants- 8 members (based on Data Warehouse numbers eff. 5/09)**

	Average Encounter Based Allowed Costs for time frame of 2 years pre-transplant	Average Encounter Based Allowed Costs for time frame for 1 year pre-transplant	Average Cost of member during transplant year	Average Cost per member for 1 <sup>st</sup> year post transplant	Average Cost per member for 2 <sup>nd</sup> year post transplant
Billed Amount	\$65,154.05	\$358,016.67	\$1,789,051.99	\$329,250.76	\$831,840.47
Allowed Amount	\$23,452.58	\$71,773.61	\$212,354.53	\$81,427.74	\$206,091.05
Paid Amount	\$12,456.71	\$54,920.05	\$171,450.91	\$67,351.39	\$185,297.71
Health Plan Paid Amount	\$14,442.00	\$58,064.93	\$296,482.60	\$67,971.70	\$70,315.98

**AHCCCS Experience with Double Lung Transplants involving 2 members (based on Data Warehouse numbers eff. 5/09)**

	Average Encounter Based Allowed Costs for time frame of 2 years pre-transplant	Average Encounter Based Allowed Costs for time frame for 1 year pre-transplant	Average Cost of member during transplant year	Average Cost per member for 1 <sup>st</sup> year post transplant	Average Cost per member for 2 <sup>nd</sup> year post transplant
Billed Amount	\$3,035.96	\$16,650.92	\$1,697,681.62	\$138,492.19	No data to report
Allowed Amount	\$2,158.81	\$10,094.38	\$230,282.27	\$52,470.66	No data to report
Paid Amount	\$1,989.66	\$7,503.60	\$142,172.96	\$.48,157.80	No data to report
Health Plan Paid Amount	\$2,011.58	\$7,282.46	\$232,683.77	\$47,699.60	No data to report

***Insurance Coverage Summary:*** Aetna covers including retransplantation for rejection;

**Medicaid:** Kansas discontinued coverage for adults in October 6, 2000; Oregon covers up to one transplant and bases criteria on survival rate of at least 20% supported by literature; Hawaii covers lung transplants in adults for certain conditions; Florida does not cover adult lung transplants;

***Recommendations:*** Adult lung transplant should be eliminated as a benefit based on the literature findings that it is primarily a palliative treatment that does not extend life expectancy. Conventional medical management yields the same long term survival in a more cost effective manner. Lung transplantation is palliative rather than curative for most patients. Due to the shortage of organs it is not currently possible to support transplantation for the purpose of quality of life reasons.

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