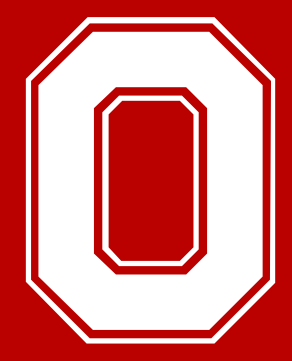


Effectiveness of Short versus Long Course Perioperative Antibiotics in Lung Transplant Recipients with Donor Positive Respiratory Cultures



THE OHIO STATE UNIVERSITY
WEXNER MEDICAL CENTER

Lindsey T. Groff, PharmD; Erica E. Reed, PharmD, BCPS, BCIDP; Kelci E. Coe, MPH; Zeinab El Boghdadly, MBBCh;
Brian C. Keller, MD, PhD, Bryan A. Whitson, MD, PhD; Pamela K. Burcham, PharmD, BCPS
The Ohio State University Wexner Medical Center (OSUWMC), Columbus, Ohio

Contact Information:
Lindsey Taylor Groff
Lindsey.Groff@osumc.edu
(210) 414-9106

*Data are presented as median [IQR] or number (percent) as appropriate

Background

- Lung transplantation is the accepted treatment for end stage lung diseases.
- Despite numerous advancements, infection remains the most common complication following lung transplantation.
 - Infection increases risk of acute and chronic lung allograft rejection, decreases function of the transplanted graft, and increases mortality.
 - Infection can be acquired from the environment or transmitted via the donor graft leading to donor derived bacterial pneumonias.
- Perioperative antibiotics are employed to limit bacterial pneumonias post-operatively. Duration of perioperative antibiotics remains controversial in the literature, ranging from 7 to 14 days.
- The purpose of this study is to evaluate the efficacy of short course (≤ 10 days) perioperative antibiotics compared to long course (≥ 11 days) perioperative antibiotics in lung transplant patients with positive donor cultures.

Study Outcomes

Primary Objective

- 30-day recipient freedom from donor-derived respiratory bacterial infection

Secondary Objectives

- Development of *Clostridioides difficile* infection
- Intensive care unit (ICU) length of stay
- Hospital length of stay
- Cumulative time on ventilator
- Time to extubation postoperatively
- In-hospital all-cause mortality
- Resistance to perioperative antibiotics within 30 days post-transplant

Methods

Study Design

- Retrospective analysis. Study timeframe August 2013 to September 2019.
- Quantitative variables: Wilcoxon rank sum test
- Qualitative variables: Pearson chi-squared test or Fisher's exact test, as appropriate.
- Statistical significance was defined as $p < 0.05$

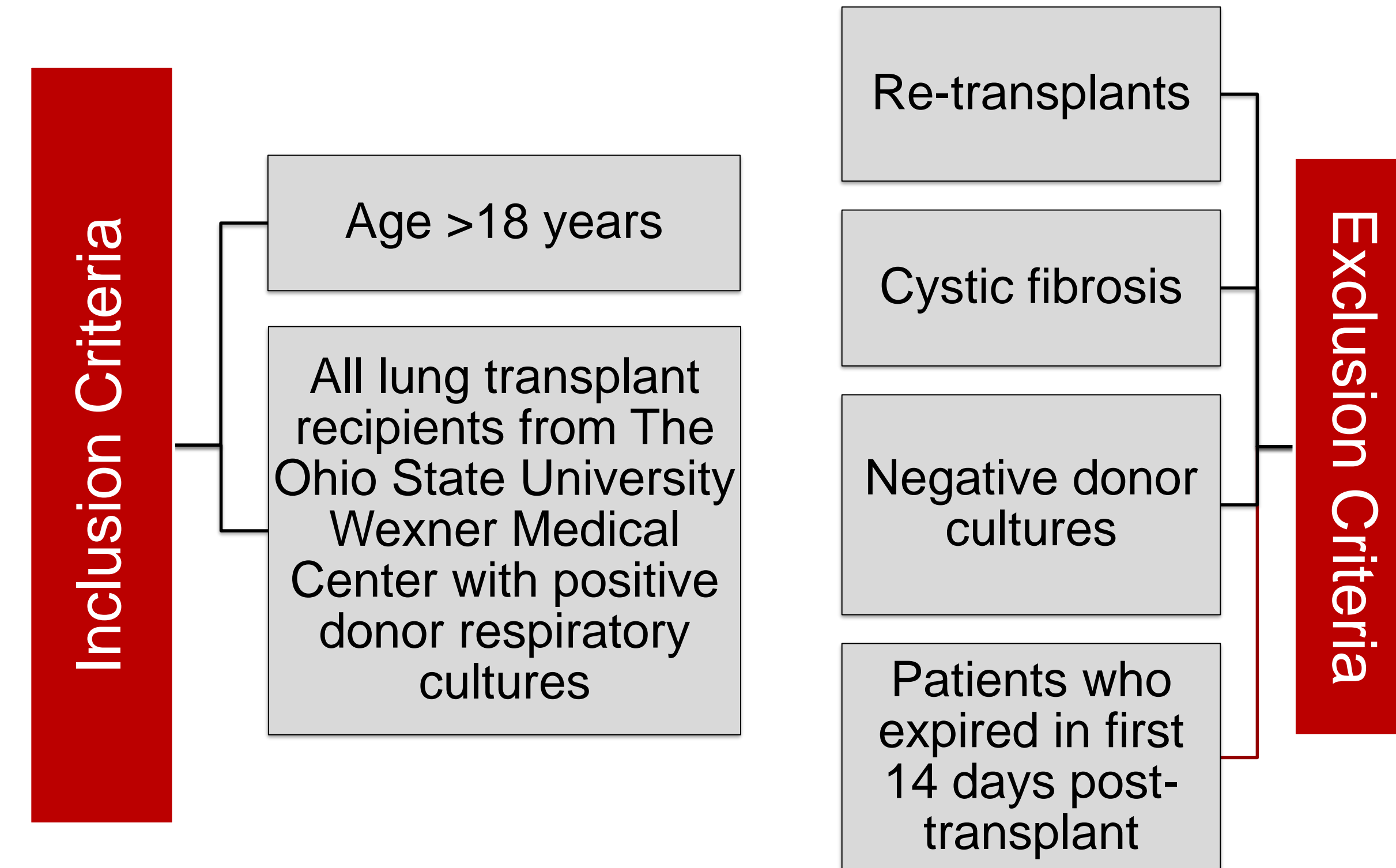
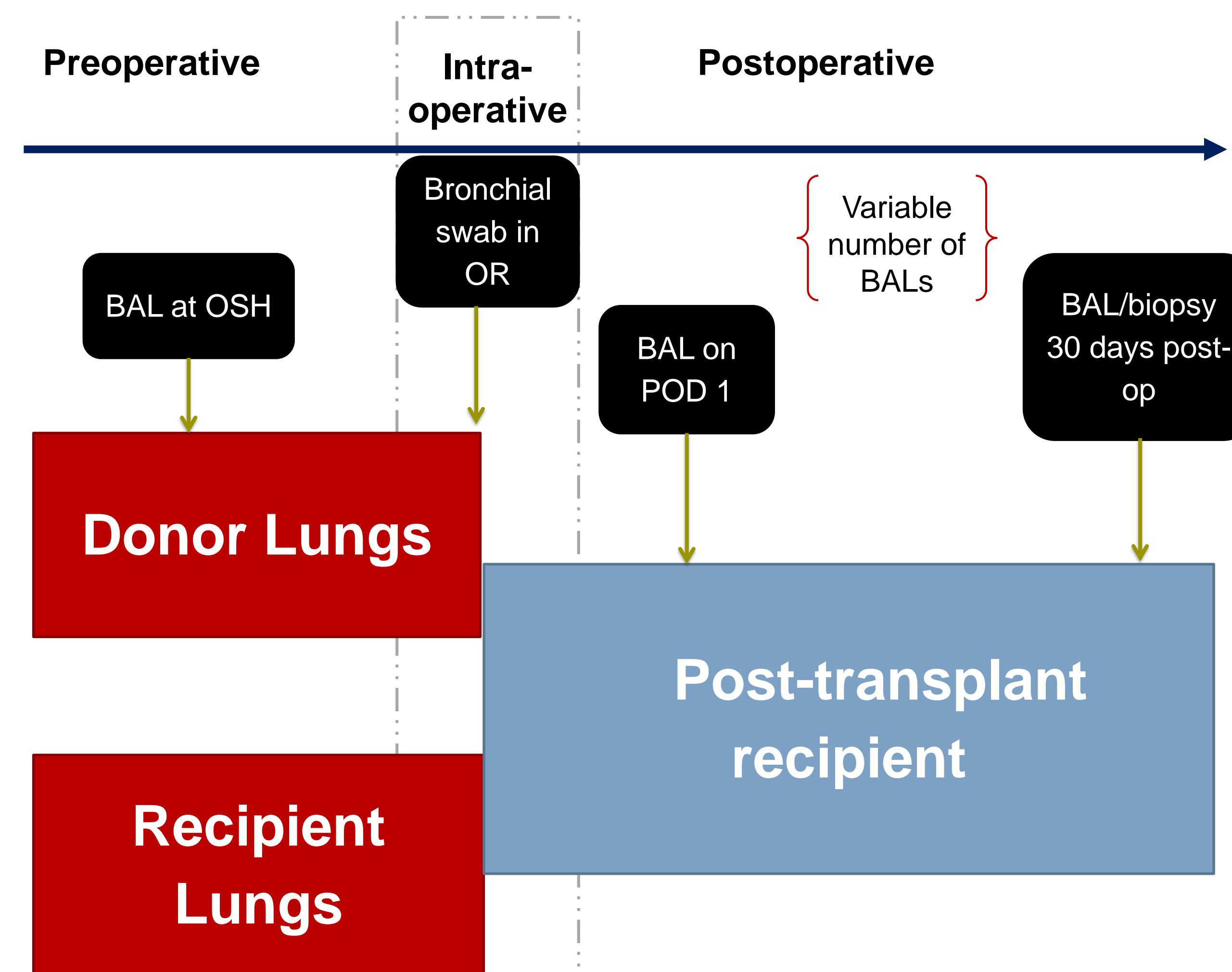


Figure 1. Lung transplant timeline



Results

Table 1. Baseline Characteristics

	Short Course (n= 58)	Long Course (n= 89)	P-value
Cumulative perioperative antibiotic duration, days	6.5 [5-10]	13 [12-17]	<0.0001
Recipient age at transplant, years	62 [59-66]	60 [55-64]	0.03
Male recipient	36 (62)	50 (56)	0.5
Bilateral Lung Transplant	31 (53)	59 (66)	0.11
Lung allocation score	35 [33-42]	35 [33-45]	0.64
Lung allocation score ≥ 50	4 (7)	17 (19)	0.05
Ischemic time total, min	356.5 [253-568]	418 [273-593]	0.54
Reoperation	7 (12)	27 (30)	0.01
Hospital length of stay, days	15.5 [11-26]	21 [15-39]	0.001
ICU length of stay, days	4 [2-8]	6 [3-17]	0.02

Table 2. Microorganisms isolated from donor and recipient respiratory cultures

	Donor Cultures		Recipient Cultures	
	Short Course (n= 58)	Long Course (n= 89)	Short Course (n= 58)	Long Course (n= 89)
MRSA	7 (12)	9 (10)	0 (0)	2 (2)
MSSA	23 (40)	48 (54)	1 (2)	5 (6)
Streptococcus spp.	17 (29)	19 (21)	3 (5)	9 (10)
Other Gram-Positive	19 (33)	24 (27)	8 (14)	18 (20)
A. baumannii	0 (0)	2 (2)	0 (0)	1 (1)
Enterobacterales	14 (24)	29 (33)	11 (19)	16 (18)
Pseudomonas spp.	1 (2)	7 (8)	7 (12)	17 (19)
S. maltophilia	3 (5)	0 (0)	0 (0)	6 (7)
Other Gram-Negative	11 (19)	14 (16)	4 (7)	10 (11)

Table 3. Clinical outcomes in lung transplant patients receiving short vs long course perioperative antibiotics

	Short Course (n= 58)	Long Course (n= 89)	P-Value
Primary Outcome			
Thirty-day freedom from donor-derived infection	56 (97)	85 (96)	1
Secondary Outcomes			
Development of <i>Clostridioides difficile</i> infection	1 (2)	5 (6)	0.4
Cumulative mechanical ventilation time (hours)	22 [10 – 81]	35 [26 – 166]	0.002
Time to postoperative extubation (hours)	19.5 [10 – 71]	32.0 [23 – 77]	0.007
In-hospital all-cause mortality	3 (5)	4 (4)	1
Isolation of resistant organisms in post-transplant recipient respiratory cultures	5 (9)	13 (15)	0.28

Conclusions

- Among lung transplant recipients with positive donor cultures, no increased risk of donor derived bacterial pneumonia was identified in patients receiving short (≤ 10 days) versus long (≥ 11 days) course perioperative antibiotics. A larger multi-center cohort study or randomized controlled trial comparing treatment durations determined a priori is warranted to validate these results.