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A Guide to Calculating the Lung Allocation Score

U.S. lung allocation policy prioritizes lung transplant candidates for lung offers by assigning them a lung allocation score.

What is the Lung Allocation Score?

The lung allocation score (LAS) is used to prioritize waiting list candidates based on a combination of waitlist urgency and post-transplant survival. In this context, *waitlist urgency* is defined as what is expected to happen to a candidate, given his or her characteristics, in the next year if he or she doesn't receive a transplant. *Post-transplant survival* is defined as what is expected to happen to a candidate, given his or her characteristics, in the first year after a transplant if he or she does receive the transplant.

What is involved in the LAS calculation?

The LAS involves the following steps:

1. ***Calculate the waiting list survival probability during the next year***
2. ***Calculate the waitlist urgency measure***
3. ***Calculate the post-transplant survival probability during the first post-transplant year***
4. ***Calculate the post-transplant survival measure***
5. ***Calculate the raw allocation score***
6. ***Normalize the raw allocation score to obtain the LAS.***

A detailed explanation for each of the steps follows.

How is the LAS actually calculated?

We've computed the LAS for a hypothetical candidate to help you understand the process.

The following description of the calculation of the LAS in this document assumes that all characteristics are known. With the exception of a few characteristics (e.g., age and diagnosis), the LAS can be computed when characteristics are missing. If a characteristic is missing, such as creatinine level or BMI, a default value is used. For some characteristics the default value is a normal value for that characteristic; for other characteristics the default is the least beneficial value for that characteristic. A normal value is a value that a healthy person would exhibit. The least beneficial value is the value that will yield the lowest LAS. In general the least beneficial value is either the minimum or maximum possible value for the characteristic.

CAUTIONARY NOTES:

- ***We rounded the parameter estimates and survival rates to 6 places after the decimal. These rounded values are used for <u>explanatory purposes only</u>. The parameter estimates and survival rates used in the actual calculation of the LAS will contain up to 16 positions after the decimal, and can be found in Policy 10.1.F, Tables 10-3 and 10-4 (parameter estimates) and Policy 10.5, Tables 10-8 and 10-9 (survival rates). The estimated LAS computed using the method in this document will be close to, but not identical to, that using the actual allocation algorithm. For candidates currently on the lung or heart-lung waiting list, please contact your transplant center to obtain your precise LAS.***
- ***The parameter estimates and baseline survival rates shown in this document are current as of February 19, 2015. Though the characteristics or estimates used in the computation may be modified in the future, the basic method for computing the LAS will not change.***

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Calculating the LAS Step by Step

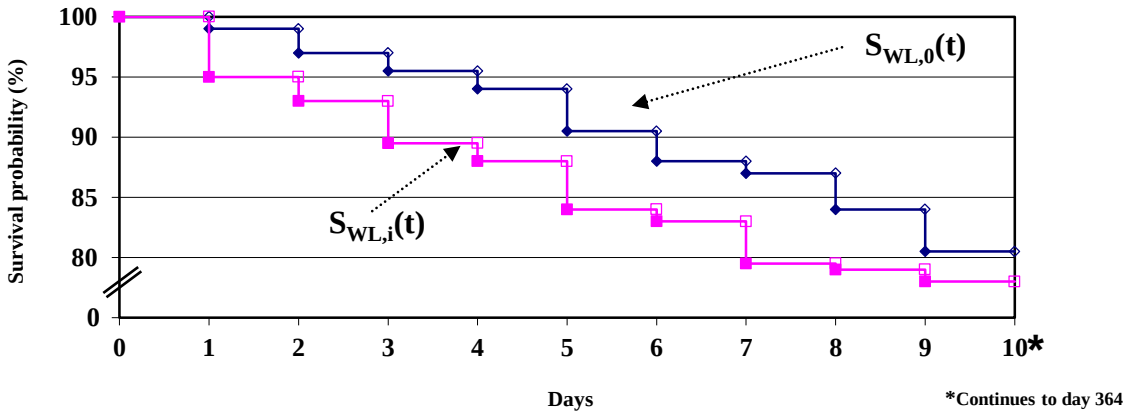
Step 1. Calculate the expected waiting list survival probability during the next year:

$$S_{WL,i}(t) = S_{WL,0}(t)^{e^{\beta_1 X_{1i} + \beta_2 X_{2i} + \ldots + \beta_p X_{pi}}}$$

where

$S_{WL,i}(t)$ is the expected waiting list survival probability at time t for candidate i
$S_{WL,0}(t)$ is the baseline waiting list survival probability at time t
i.e., the survival probability for a candidate with all characteristics at baseline values (Appendix 1)
$\beta_1, \beta_2, \ldots \beta_p$ are the parameter estimates from the waiting list model (Table 1)
X_{ji} is the value of characteristic j for candidate i (j = 1, 2, …, p)
i = 1, 2, …, N is the candidate identifier

This step adjusts the baseline survival at each time point ($S_{WL,0}(t)$) by the candidate's characteristics to yield the expected waiting list survival probability for the candidate, $S_{WL,i}(t)$. The resulting survival may be either higher or lower than the baseline survival. A hypothetical example, in which the expected survival for candidate i is lower than the baseline survival, follows:



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Computing a candidate's expected waiting list survival probability during the next year involves three calculations:

(i) Sum the product of parameter estimates and characteristic values for candidate i: $\beta_1 X_{1i} + \beta_2 X_{2i} + \ldots + \beta_p X_{pi}$ (For β values see Table 1.)

(ii) Exponentiate this sum: $e^{\beta_1 x_{1i} + \beta_2 x_{2i} + \ldots + \beta_p x_{pi}}$

(iii) Apply the exponent to the baseline survival at all time points during the next year: $S_{WL,0}(t)^{e^{\beta_1 X_{1i} + \beta_2 X_{2i} + \ldots + \beta_p X_{pi}}}$ (For baseline survival values see Appendix 1.)

Table 1. Parameter estimates for waiting list model

CHARACTERISTIC (X)		β and conditions
Age at offer		0.0084*age
Bilirubin (mg/dL)		0.0432*(bilirubin – 1), if bilirubin ≥ 1
Bilirubin increase of at least 50%[1]		1.4144, if diagnosis group B
Body mass index (BMI) (kg/m^2)		0.1261*(20 – BMI), if BMI < 20 kg/m^2
Cardiac index prior to any exercise (L/min/m^2)		0.5435, if cardiac index < 2 L/min/m^2
Central venous pressure (CVP) (mmHg) at rest, prior to any exercise		0.0174*(CVP – 7), if CVP > 7 mmHg and diagnosis group B
Continuous mechanical ventilation, if candidate is hospitalized		1.6771
Creatinine (serum) (mg/dL)		0.5034*creatinine, if candidate at least 18 years old at time of offer
Diabetes (regardless of insulin dependency)		0.4680
Diagnosis[2]	Group A	0
	Group B	1.5774
	Group C	1.2314
	Group D	0.6260
Diagnosis detailed	Bronchiectasis (in Group A)	0.6681
	Eisenmenger's syndrome (in Group B)	-0.6279
	Lymphangioleiomyomatosis (in Group A)	-0.3163
	Obliterative bronchiolitis (not retransplant) (in Group D)	0.4453
	Pulmonary fibrosis, not idiopathic (in Group D)	-0.2091
	Sarcoidosis with PA mean pressure > 30 mmHg (in group D)	-0.4578
	Sarcoidosis with PA mean pressure ≤ 30 mmHg (in group A)	0.9331
Forced vital capacity (FVC) % predicted		0.1829*(80-FVC)/10, if FVC < 80% and diagnosis group D
Functional status		-0.4471, if no assistance needed with activities of daily living
Oxygen need to maintain adequate oxygen saturation (88% or greater) at rest (L/min)		0.0213*O_2, if diagnosis group B; 0.1188*O_2, if diagnosis groups A, C or D
pCO_2		0.1105*pCO_2/10, if $pCO_2 \geq 40$
pCO_2 increase of at least 15%[3]		0.2331
Pulmonary artery (PA) systolic pressure at rest, prior to any exercise (mmHg)		0.4155*(PA systolic – 40)/10, if PA systolic > 40 mmHg and group A; 0.0462*PA systolic/10, if diagnosis groups B, C or D
Six-minute walk distance (feet) obtained while the candidate was receiving supplemental oxygen required to maintain an oxygen saturation of 88% or greater at rest.		-0.0845*six-minute walk distance/100

[1] For details of the bilirubin increase calculation, see Policy 10.1.F.iii
[2] For a listing of diagnoses within each grouping, see Policy 10.1.F.i
[3] For details of the pCO_2 increase calculation, see Policy 10.1.F.ii

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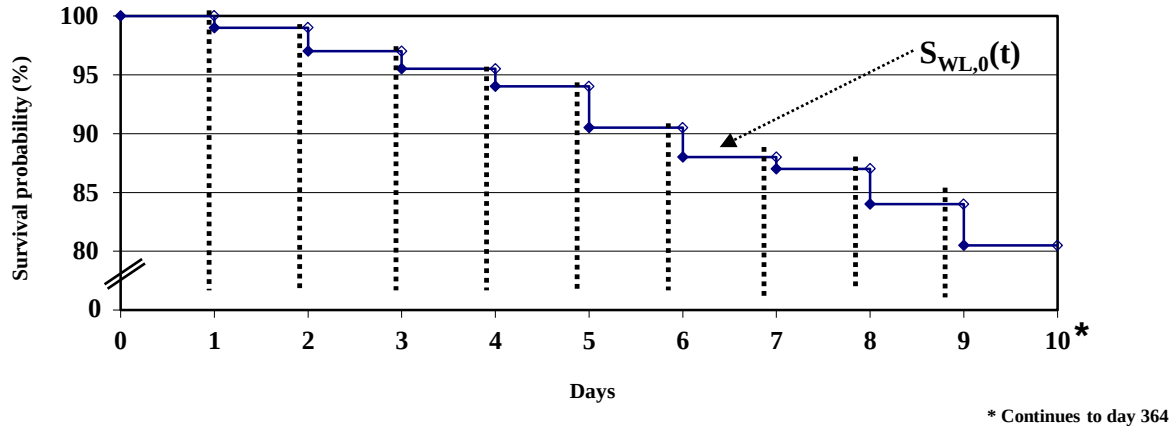
Calculate the waitlist urgency measure:

The ***waitlist urgency measure*** (WL_i) is defined as the area under the waiting list survival probability curve during the next year on the waiting list. This can be interpreted as the number of days a candidate with a specified set of characteristics is expected to live during the next year on the waiting list.

Since the baseline survival, $S_{WL,0}(t)$, is based on information collected on a per-day basis (e.g., patients alive or having died per day) rather than an hourly basis, the survival probability stays the same during an entire day. This results in a "curve" that is actually a large set of stair-steps. Similarly the candidate's waiting list survival curve, $S_{WL,i}(t)$, is also a stair-step function but with different heights for the steps (as shown in the previous figure.)

In this example, the area under the baseline survival curve, $S_{WL,0}(t)$, can be computed as the sum of the areas of the rectangles, where the width is 1 day and the height is the survival rate on that day:



Each candidate's set of characteristics will adjust the height of each rectangle: $S_{WL,0}(t)$ is adjusted by the candidate's characteristics to $S_{WL,i}(t)$. The height of the rectangle for candidate i from 0 to 1 day is $S_{WL,i}(0)$, from 1 to 2 days the rectangle's height is $S_{WL,i}(1)$, and so on. The width of the rectangles remains the same for all candidates: 1 day.

The waiting list urgency measure (WL_i), the area under the waiting list survival probability curve during the next 1 year, can be written mathematically as:

$$WL_i = \sum_{k=1}^{365} Height_k * Width_k = \sum_{k=1}^{365} S_{WL,i}(k-1) * 1\,day, \text{ for candidate i}$$

Theoretically WL_i can range from approximately 0 days (if the expected survival is 0 at day 1) to 365 days (if the expected survival is 100% during the entire next year on the waiting list). But these are the most extreme cases; most candidates will have a WL_i value greater than 0 but less than 365 days.

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Step 2. Calculate the expected post-transplant survival probability during the first post-transplant year:

$$S_{TX,i}(t) = S_{TX,0}(t)^{e^{\alpha_1 Y_{1i} + \alpha_2 Y_{2i} + \ldots + \alpha_q Y_{qi}}}$$

where

$S_{TX,i}(t)$ is the expected post-transplant survival probability at time t for candidate i
$S_{TX,0}(t)$ is the baseline post-transplant survival probability at time t,
i.e., the survival probability for a candidate with all characteristics at the baseline value (Appendix 2)
$\alpha_1, \alpha_2, \ldots \alpha_q$ are the parameter estimates from the post-transplant model (Table 2)
Y_{ji} is the value of characteristic j for candidate i (j = 1, 2, …, q)
i = 1, 2, …, N is the candidate identifier

This is the same calculation as was performed in Step 1, but now the characteristics, parameter estimates and baseline survival are for the post-transplant period rather than for the waiting period.

Table 2. Parameter estimates for post-transplant model

CHARACTERISTIC (Y)		α and conditions
Age at transplant (years)		0.0247*(age – 45.9972602), if candidate age ≥ 46 years
Cardiac index prior to any exercise (L/min/m^2)		0.3499, if cardiac index < 2 L/min/m^2
Continuous mechanical ventilation, if candidate is hospitalized		0.6094
Creatinine at transplant (mg/dl)		0.0896*creatinine, if candidate age ≥ 18 years
Creatinine increase ≥ 150%[4]		0.7709
Diagnosis[5]	Group A	0
	Group B	0.6116
	Group C	0.3627
	Group D	0.4641
Diagnosis detailed	Bronchiectasis (in Group A)	0.1889
	Eisenmenger's syndrome (in Group B)	0.9147
	Lymphangioleiomyomatosis (in Group A)	-1.5194
	Obliterative bronchiolitis (not retransplant) (in Group D)	-1.2051
	Pulmonary fibrosis, not idiopathic (in Group D)	-0.0724
	Sarcoidosis with PA mean pressure > 30 mmHg (in group D)	-0.0438
	Sarcoidosis with PA mean pressure ≤ 30 mmHg (in group A)	-0.1389
Functional status: If no assistance needed to perform activities of daily living		-0.1900
Oxygen need to maintain adequate oxygen saturation (88% or greater) at rest (L/min)		0.0748*O_2, if diagnosis group A; 0.0164*O_2, if diagnosis groups B, C or D
Six-minute walk distance (feet) obtained while the candidate was receiving supplemental oxygen required to maintain an oxygen saturation of 88% or greater at rest.		0.0005*(1200 - six-minute walk distance)

[4] For details of the creatinine increase calculation, see Policy 10.1.F.iv
[5] For a listing of diagnoses within each grouping, see Policy 10.1.F.i

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As with the waiting list survival probability computation in Step 1, the expected post-transplant survival probability computation requires 3 separate calculations:

(i) Sum the product of parameter estimates and characteristic values for candidate i: $\alpha_1 Y_{1i} + \alpha_2 Y_{2i} + \ldots + \alpha_q Y_{qi}$ (For α values see Table 2.)

(ii) Exponentiate this sum: $e^{\alpha_1 y_{1i} + \alpha_2 y_{2i} + \ldots + \alpha_q y_{qi}}$

(iii) Apply the exponent to the baseline survival at all time points during the first post-transplant year: $S_{TX,0}(t)^{e^{\alpha_1 Y_{1i} + \alpha_2 Y_{2i} + \ldots + \alpha_q Y_{qi}}}$ (For baseline survival values see Appendix 2.)

Step 3. Calculate the post-transplant survival measure:

The logic for this computation is identical to the waiting list side. The ***post-transplant survival measure*** for candidate i (PT_i) is the area under the post-transplant curve during the first year. It can be calculated by summing the area of rectangles with height of $S_{TX,i}(t)$ and width of 1day.

$$PT_i = \sum_{k=1}^{365} Height_k * Width_k = \sum_{k=1}^{365} S_{TX,i}(k-1) * 1\,day, \text{ for candidate i}$$

As with WL_i, the theoretical range of PT_i is 0 days to 365 days, though most candidates will fall somewhere in between.

Step 4. Calculate the raw allocation score:

The ***transplant benefit measure*** for candidate i ($Benefit_i$) is:

$Benefit_i$ = $PT_i - WL_i$
= expected days lived during 1st year post-transplant – expected days lived during additional year on waiting list
= additional days of life lived with a transplant than without a transplant

The ***raw allocation score*** for candidate i ($Raw\ score_i$) is:

$Raw\ score_i$ = $Benefit_i - WL_i$
= $PT_i - 2*WL_i$

Since WL_i and PT_i both range from 0 to 365 the range of the raw score is -730 to 365.

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Step 5. Normalize the raw allocation score to obtain the LAS:
To obtain a final score that ranges from 0 to 100, the raw score must be normalized.

After normalization, the raw score of -730 should correspond to an LAS of 0; and a raw score of 365 will correspond to an LAS of 100.

Therefore the normalization is:

$$LAS_i = 100*\frac{[\text{Raw score}_i - \textit{minimum}]}{\textit{range}}$$

$$= 100*\frac{[\text{Raw score}_i - (-730)]}{1095}$$

$$= 100*\frac{[\text{Raw score}_i + 730]}{1095}$$

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EXAMPLE

Assume that Candidate Z has the following set of characteristics:

Characteristic	Value for Candidate Z
Age at offer	51 years
Bilirubin (mg/dL)	1.5 mg/dL
Bilirubin increase of at least 50%	No
Height	5 ft 8 in (1.727 m)
Weight	165 lbs (74.84 kg)
Cardiac index prior to any exercise	2 L/min/m^2
Central venous pressure (CVP) (mmHg) at rest, prior to any exercise	5 mmHg
Continuous mechanical ventilation, if candidate is hospitalized	Not on continuous mechanical ventilation
Creatinine (serum) (mg/dL)	1.0 mg/dL
Diabetes (regardless of insulin dependency)	Not diabetic
Diagnosis	Emphysema (group A)
Forced vital capacity (FVC) % predicted	50%
Functional status	Requires some assistance to perform activities of daily living
Oxygen need to maintain adequate oxygen saturation (88% or greater) at rest (L/min)	4 L/min
pCO_2	52 mmHg
pCO_2 increase of at least 15%	Yes
Pulmonary artery (PA) systolic pressure at rest, prior to any exercise (mmHg)	40 mmHg
Six-minute walk distance (feet) obtained while the candidate was receiving supplemental oxygen required to maintain an oxygen saturation of 88% or greater at rest.	800 feet

BMI = weight (kg)/height $(m)^2$
$=.84 \text{ kg}/(1.727 \text{ m})^2$
$= 25.092799 \text{ kg}/m^2$

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Step 1. Calculate the waiting list survival probability:

$$S_{WL,Z}(t) = S_{WL,0}(t)^{e^{\beta_1 X_{1z} + \beta_2 X_{2z} + \ldots + \beta_p X_{pz}}}$$

a) First, calculate the exponent: $\beta_1 X_{1z} + \beta_2 X_{2z} + \ldots + \beta_p X_{pz}$

CHARACTERISTIC (X)		Value for Candidate Z (X_{pz}†)	β_p	$\beta_p * X_{pz}$
Age at offer		51 years	0.0084	0.4284
Bilirubin (mg/dL)		1.5 mg/dL	0.0432*(bilirubin – 1), if bilirubin ≥ 1	0.0216
Bilirubin increase of at least 50%		0	1.4144	0
Body mass index (BMI) (kg/m^2)		25.092799	0.1261*BMI if BMI < 20	0
Cardiac index prior to any exercise (L/min/m^2)		2 L/min/m^2	0.5435, if cardiac index < 2 L/min/m^2	0
Central venous pressure (CVP) (mmHg) at rest, prior to any exercise		5 mmHg	0.0174*(CVP – 7), if CVP > 7 mmHg and diagnosis group B	0
Continuous mechanical ventilation, if candidate is hospitalized		Not on continuous mechanical ventilation	1.6771	0
Creatinine (serum) (mg/dL)		1.0 mg/dL	0.5034*creatinine, if candidate at least 18 years old at time of offer	0.5034
Diabetes (regardless of insulin dependency)		Not diabetic	0.4680	0
Diagnosis	Group A	Yes	0	0
	Group B	No	1.5774	0
	Group C	No	1.2314	0
	Group D	No	0.6260	0
Diagnosis detailed	Bronchiectasis	No	0.6681	0
	Eisenmenger's syndrome	No	-0.6279	0
	Lymphangioleiomyomatosis	No	-0.3163	0
	Obliterative bronchiolitis (not retransplant)	No	0.4453	0
	Pulmonary fibrosis, not idiopathic	No	-0.2091	0
	Sarcoidosis with PA mean pressure > 30 mmHg	No	-0.4578	0
	Sarcoidosis with PA mean pressure ≤ 30 mmHg	No	0.9331	0
Forced vital capacity (FVC) % predicted		50%	0.1829*(80-FVC)/10, if FVC < 80% and diagnosis group D	0
Functional status		Requires some assistance to perform activities of daily living	-0.4471, if no assistance need with activities of daily living	0
Oxygen need to maintain adequate oxygen saturation (88% or greater) at rest (L/min)		4 L/min	0.0213*O_2, if diagnosis group B; 0.1188*O_2, if diagnosis groups A, C or D	0.4752
pCO_2		52 mmHg	0.1105*PCO_2/10, if $PCO_2 \geq 40$	0.5746
pCO_2 increase of at least 15%		Yes	0.2331	0.2331
Pulmonary artery (PA) systolic pressure at rest, prior to any exercise (mmHg)		40 mmHg	0.4155*(PA systolic – 40)/10, if PA systolic > 40 mmHg and group A; 0.0462*PA systolic/10, if diagnosis groups B, C or D	0
Six-minute walk distance (feet) obtained while the candidate was receiving supplemental oxygen required to maintain an oxygen saturation of 88% or greater at rest.		800 ft	-0.0845*six-minute walk distance/100	-0.6760
TOTAL		$\beta_1 X_{1z} + \beta_2 X_{2z} + \ldots + \beta_p X_{pz} =$		1.5603

Note: If the characteristic is dichotomous (e.g., Yes/No) and the candidate does not have the characteristic, the value of X is 0. If the candidate does have the characteristic X = 1.

b) Exponentiate the result: $e^{\beta_1 X_{1i} + \beta_2 X_{2i} + \ldots + \beta_p X_{pi}} = e^{1.5603} = 4.76025$

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c) Compute the waiting list survival probabilities at each time point for Candidate Z.

(Baseline waiting list survival excerpted from Appendix 1)

Time (days) = t	Baseline waiting list survival = $S_{WL,O}(t)$	$S_{WL,Z}(t) = S_{WL,O}(t)^{4.76025}$
0	1.000000	1
1	0.999991	0.999957
2	0.999925	0.999643
3	0.999867	0.999367
4	0.999746	0.998791
5	0.999598	0.998088
6	0.999499	0.997617
7	0.999371	0.997009
8	0.999305	0.996696
9	0.999218	0.996283
10	0.999085	0.995652
…	…	…
364	0.976709	0.893882
$\sum S_{WL}$ = WL	360.6841 days	345.0430 days

Step 2. Calculate the waitlist urgency measure:

$$WL_z = \sum_{k=1}^{365} S_{WL,Z}(k-1) * 1\,day = 345.0430\,days$$

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Step 3. Calculate the post-transplant survival probability during the first post-transplant year:

$$S_{TX,Z}(t) = S_{TX,0}(t)^{e^{\alpha_1 Y_{1z} + \alpha_2 Y_{2z} + \ldots + \alpha_q Y_{qz}}}$$

a) First, calculate the exponent: $\alpha_1 Y_{1z} + \alpha_2 Y_{2z} + \ldots + \alpha_q Y_{qz}$

CHARACTERISTIC (Y)		Value for Candidate Z (Y_{qz}†)	α_q	$\alpha_q * Y_{qz}$
Age at transplant		51 years	0.0247*(age – 45.9972602), if candidate age ≥ 46 years	0.1236
Cardiac index prior to any exercise (L/min/m^2)		2 L/min/m^2	0.3499, if cardiac index < 2 L/min/m^2	0
Continuous mechanical ventilation, if candidate is hospitalized		Not on continuous mechanical ventilation	0.6094	0
Creatinine (serum) (mg/dL)		1.0 mg/dL	0.0896*creatinine, if candidate age ≥ 18 years	0.0896
Creatinine increase ≥ 150%		No	0.7709	0
Diagnosis	Group A	Yes	0	0
	Group B	No	0.6116	0
	Group C	No	0.3627	0
	Group D	No	0.4641	0
Diagnosis detailed	Bronchiectasis	No	0.1889	0
	Eisenmenger's syndrome	No	0.9147	0
	Lymphangioleiomyomatosis	No	-1.5194	0
	Obliterative bronchiolitis (not retransplant)	No	-1.2051	0
	Pulmonary fibrosis, not idiopathic	No	-0.0724	0
	Sarcoidosis with PA mean pressure > 30 mmHg	No	-0.0438	0
	Sarcoidosis with PA mean pressure ≤ 30 mmHg	No	-0.1389	0
Functional status		Requires some assistance to perform activities of daily living	-0.1900, if no assistance needed to perform activities of daily living	0
Oxygen need to maintain adequate oxygen saturation (88% or greater) at rest (L/min)		4 L/min	0.0748*O_2, if diagnosis group A; 0.0164*O_2, if diagnosis groups B, C or D	0.2992
Six-minute walk distance (feet) obtained while the candidate was receiving supplemental oxygen required to maintain an oxygen saturation of 88% or greater at rest.		800 ft	0.0005*(1200 - six-minute walk distance)	0.2000
TOTAL			$\alpha_1 Y_{1z} + \alpha_2 Y_{2z} + \ldots + \alpha_q Y_{qz} =$	0.7124

†**Note**: If the characteristic is dichotomous (e.g., Yes/No) and the candidate does not have the characteristic, the value of Y is 0. If the candidate does have the characteristic Y = 1.

b) Exponentiate the result: $e^{\alpha_1 Y_{1i} + \alpha_2 Y_{2i} + \ldots + \alpha_q Y_{qi}} = e^{0.7124} = 2.03888$

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c) Compute the post-transplant survival probabilities at each time point for Candidate Z.

(Baseline post-transplant survival excerpted from Appendix 2.)

Time (days) = t	Baseline post-transplant survival = $S_{TX,0}(t)$	$S_{TX,Z}(t) = S_{TX,0}(t)^{2.03888}$
0	0.998946	0.997852
1	0.997558	0.995028
2	0.996895	0.99368
3	0.996364	0.992601
4	0.995498	0.990843
5	0.995165	0.990167
6	0.994565	0.98895
7	0.994164	0.988138
8	0.993963	0.98773
9	0.993360	0.986509
10	0.993159	0.986102
…	…	…
364	0.941315	0.883997
$\sum S_{TX}$ = PT	351.4394 days	337.9676 days

Step 4. Calculate the post-transplant survival measure:

$$PT_i = \sum_{k=1}^{365} S_{TX,i}(k-1) * 1\,day = 337.9676\,\text{days}$$

Step 5. Calculate the raw allocation score:

Raw $score_i$ = $PT_i - 2*WL_i$
= 337.9676 – 2*345.0430
= -352.1184

Step 6. Normalize the raw allocation score to obtain the LAS:

LAS = $\frac{100*[\text{Raw score}_i + 730]}{1095}$
= $\frac{100*[-352.1184 + 730]}{1095}$
= 34.5097

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Appendix 1. Baseline waiting list (WL) survival probability[6]

Time (days)	WL survival	Time (days)	WL survival	Time (days)	WL survival	Time (days)	WL survival	Time (days)	WL survival	Time (days)	WL survival
0	1.000000	61	0.995909	122	0.991514	183	0.988021	244	0.983753	305	0.980397
1	0.999991	62	0.995873	123	0.991514	184	0.987934	245	0.983753	306	0.980397
2	0.999925	63	0.995846	124	0.991514	185	0.987885	246	0.983753	307	0.980339
3	0.999867	64	0.995846	125	0.991488	186	0.987885	247	0.983697	308	0.980339
4	0.999746	65	0.995614	126	0.991462	187	0.987885	248	0.983636	309	0.980339
5	0.999598	66	0.995553	127	0.991393	188	0.987885	249	0.983636	310	0.980339
6	0.999499	67	0.995553	128	0.991307	189	0.987856	250	0.983636	311	0.980339
7	0.999371	68	0.995553	129	0.991307	190	0.987856	251	0.983636	312	0.980339
8	0.999305	69	0.995500	130	0.991270	191	0.987856	252	0.983243	313	0.980339
9	0.999218	70	0.995479	131	0.991236	192	0.987856	253	0.983243	314	0.980339
10	0.999085	71	0.995349	132	0.991236	193	0.987856	254	0.983243	315	0.980218
11	0.998990	72	0.995293	133	0.991053	194	0.987608	255	0.983097	316	0.980218
12	0.998887	73	0.995136	134	0.991012	195	0.987359	256	0.983097	317	0.980218
13	0.998816	74	0.994965	135	0.991012	196	0.987299	257	0.983097	318	0.980129
14	0.998730	75	0.994821	136	0.990978	197	0.987263	258	0.983097	319	0.980129
15	0.998660	76	0.994774	137	0.990978	198	0.987155	259	0.983097	320	0.980016
16	0.998588	77	0.994702	138	0.990978	199	0.987122	260	0.983097	321	0.980016
17	0.998455	78	0.994702	139	0.990936	200	0.986530	261	0.983097	322	0.980016
18	0.998362	79	0.994634	140	0.990901	201	0.986530	262	0.983052	323	0.979773
19	0.998259	80	0.994565	141	0.990901	202	0.986480	263	0.983052	324	0.979773
20	0.998220	81	0.994547	142	0.990811	203	0.985963	264	0.983052	325	0.979671
21	0.998068	82	0.994465	143	0.990739	204	0.985926	265	0.983052	326	0.979671
22	0.998036	83	0.994465	144	0.990595	205	0.985926	266	0.983052	327	0.979164
23	0.997972	84	0.994297	145	0.990595	206	0.985820	267	0.983052	328	0.979164
24	0.997868	85	0.994297	146	0.990540	207	0.985820	268	0.982960	329	0.979164
25	0.997770	86	0.994297	147	0.990540	208	0.985742	269	0.982960	330	0.979164
26	0.997742	87	0.994297	148	0.990540	209	0.985742	270	0.982960	331	0.979100
27	0.997667	88	0.994181	149	0.990540	210	0.985742	271	0.982797	332	0.979100
28	0.997626	89	0.994077	150	0.990540	211	0.985708	272	0.982797	333	0.978935
29	0.997540	90	0.994035	151	0.990540	212	0.985708	273	0.982797	334	0.978935
30	0.997473	91	0.994008	152	0.990384	213	0.985541	274	0.982797	335	0.978817
31	0.997391	92	0.993866	153	0.990333	214	0.985541	275	0.982700	336	0.978817
32	0.997327	93	0.993831	154	0.990333	215	0.985541	276	0.982603	337	0.978817
33	0.997297	94	0.993807	155	0.990333	216	0.985450	277	0.982603	338	0.978817
34	0.997274	95	0.993715	156	0.990245	217	0.985450	278	0.982511	339	0.978817
35	0.997242	96	0.993308	157	0.990245	218	0.985450	279	0.982457	340	0.978817
36	0.997242	97	0.993220	158	0.990245	219	0.985330	280	0.982457	341	0.978597
37	0.997181	98	0.993160	159	0.990145	220	0.985265	281	0.982457	342	0.978597
38	0.997137	99	0.993098	160	0.989689	221	0.985265	282	0.982413	343	0.978301
39	0.997121	100	0.993061	161	0.989689	222	0.985265	283	0.982323	344	0.978250
40	0.997121	101	0.993005	162	0.989652	223	0.985265	284	0.982323	345	0.978250
41	0.997019	102	0.993005	163	0.989575	224	0.985265	285	0.982323	346	0.978250
42	0.996946	103	0.992938	164	0.989575	225	0.984621	286	0.982323	347	0.978117
43	0.996916	104	0.992938	165	0.988903	226	0.984549	287	0.982323	348	0.978037
44	0.996849	105	0.992883	166	0.988873	227	0.984549	288	0.982323	349	0.978037
45	0.996849	106	0.992883	167	0.988873	228	0.984549	289	0.982323	350	0.978037
46	0.996820	107	0.992851	168	0.988784	229	0.984549	290	0.982323	351	0.978037
47	0.996780	108	0.992762	169	0.988722	230	0.984489	291	0.981916	352	0.977937
48	0.996731	109	0.992724	170	0.988695	231	0.984489	292	0.981878	353	0.977937
49	0.996644	110	0.992643	171	0.988695	232	0.984396	293	0.981827	354	0.977937
50	0.996543	111	0.992643	172	0.988695	233	0.984324	294	0.981827	355	0.977855
51	0.996518	112	0.992562	173	0.988655	234	0.984280	295	0.981573	356	0.977855
52	0.996397	113	0.992089	174	0.988655	235	0.984079	296	0.981319	357	0.977855
53	0.996397	114	0.992064	175	0.988655	236	0.984079	297	0.980775	358	0.977710
54	0.996363	115	0.992040	176	0.988625	237	0.984015	298	0.980775	359	0.977710
55	0.996305	116	0.991997	177	0.988548	238	0.984015	299	0.980519	360	0.976881
56	0.996191	117	0.991966	178	0.988548	239	0.984015	300	0.980397	361	0.976881
57	0.996119	118	0.991940	179	0.988548	240	0.984015	301	0.980397	362	0.976881
58	0.995942	119	0.991940	180	0.988062	241	0.983835	302	0.980397	363	0.976709
59	0.995942	120	0.991940	181	0.988062	242	0.983835	303	0.980397	364	0.976709
60	0.995909	121	0.991514	182	0.988062	243	0.983792	304	0.980397		

[6] For more detailed waiting list survival probabilities, see Policy 10.5, Table 10-8.

A Guide to Calculating the Lung Allocation Score

Appendix 2. Baseline post-transplant (TX) survival probability[7]

Time (days)	TX survival	Time (days)	TX survival	Time (days)	TX survival	Time (days)	TX survival	Time (days)	TX survival	Time (days)	TX survival
0	0.998946	61	0.978452	122	0.968956	183	0.960075	244	0.953850	305	0.947360
1	0.997558	62	0.978382	123	0.968667	184	0.959852	245	0.953850	306	0.947283
2	0.996895	63	0.978170	124	0.968594	185	0.959778	246	0.953774	307	0.947283
3	0.996364	64	0.978100	125	0.968377	186	0.959703	247	0.953774	308	0.947206
4	0.995498	65	0.977959	126	0.968159	187	0.959629	248	0.953698	309	0.947129
5	0.995165	66	0.977818	127	0.968086	188	0.959554	249	0.953623	310	0.946975
6	0.994565	67	0.977818	128	0.967868	189	0.959480	250	0.953395	311	0.946821
7	0.994164	68	0.977536	129	0.967796	190	0.959256	251	0.953319	312	0.946821
8	0.993963	69	0.977254	130	0.967504	191	0.959107	252	0.953016	313	0.946821
9	0.993360	70	0.977042	131	0.967359	192	0.959033	253	0.953016	314	0.946744
10	0.993159	71	0.976971	132	0.967140	193	0.959033	254	0.952712	315	0.946590
11	0.992487	72	0.976901	133	0.967140	194	0.958735	255	0.952712	316	0.946436
12	0.992353	73	0.976759	134	0.966994	195	0.958585	256	0.952712	317	0.946359
13	0.991949	74	0.976547	135	0.966702	196	0.958585	257	0.952484	318	0.946359
14	0.991679	75	0.976476	136	0.966483	197	0.958511	258	0.952408	319	0.946204
15	0.991207	76	0.976193	137	0.966483	198	0.958361	259	0.952332	320	0.946204
16	0.990531	77	0.975909	138	0.966410	199	0.958062	260	0.952256	321	0.946127
17	0.990260	78	0.975767	139	0.966263	200	0.958062	261	0.952180	322	0.946050
18	0.989921	79	0.975625	140	0.966190	201	0.957987	262	0.952104	323	0.946050
19	0.989582	80	0.975483	141	0.966190	202	0.957987	263	0.951876	324	0.945896
20	0.989514	81	0.975483	142	0.965971	203	0.957913	264	0.951800	325	0.945818
21	0.988902	82	0.975483	143	0.965751	204	0.957763	265	0.951648	326	0.945587
22	0.988220	83	0.974985	144	0.965678	205	0.957613	266	0.951648	327	0.945432
23	0.987810	84	0.974985	145	0.965311	206	0.957538	267	0.951572	328	0.945432
24	0.987469	85	0.974700	146	0.965165	207	0.957388	268	0.951495	329	0.945355
25	0.987263	86	0.974700	147	0.965018	208	0.957313	269	0.951190	330	0.945278
26	0.987058	87	0.974415	148	0.965018	209	0.957238	270	0.950961	331	0.945123
27	0.986578	88	0.973987	149	0.964724	210	0.957163	271	0.950656	332	0.945123
28	0.986304	89	0.973845	150	0.964651	211	0.957163	272	0.950579	333	0.944968
29	0.986030	90	0.973630	151	0.964504	212	0.956938	273	0.950427	334	0.944891
30	0.985961	91	0.973416	152	0.964357	213	0.956863	274	0.950274	335	0.944736
31	0.985755	92	0.973416	153	0.964063	214	0.956788	275	0.950121	336	0.944581
32	0.985480	93	0.973202	154	0.963843	215	0.956713	276	0.950121	337	0.944504
33	0.985136	94	0.973059	155	0.963696	216	0.956638	277	0.949815	338	0.944194
34	0.984929	95	0.972916	156	0.963475	217	0.956488	278	0.949662	339	0.944039
35	0.984515	96	0.972629	157	0.963328	218	0.956263	279	0.949662	340	0.943961
36	0.984446	97	0.972415	158	0.963107	219	0.956263	280	0.949585	341	0.943729
37	0.984170	98	0.972415	159	0.962738	220	0.956187	281	0.949585	342	0.943651
38	0.983825	99	0.972128	160	0.962517	221	0.956112	282	0.949432	343	0.943573
39	0.983479	100	0.971984	161	0.962443	222	0.956037	283	0.949355	344	0.943418
40	0.983202	101	0.971769	162	0.962296	223	0.955887	284	0.949279	345	0.943341
41	0.983063	102	0.971697	163	0.962074	224	0.955736	285	0.949279	346	0.943108
42	0.982855	103	0.971553	164	0.961927	225	0.955736	286	0.949202	347	0.943030
43	0.982716	104	0.971337	165	0.961705	226	0.955736	287	0.949202	348	0.943030
44	0.982578	105	0.971265	166	0.961631	227	0.955661	288	0.949126	349	0.942952
45	0.982300	106	0.971193	167	0.961557	228	0.955661	289	0.949049	350	0.942719
46	0.982160	107	0.971121	168	0.961483	229	0.955510	290	0.948896	351	0.942719
47	0.981952	108	0.971049	169	0.961483	230	0.955510	291	0.948819	352	0.942719
48	0.981882	109	0.970977	170	0.961409	231	0.955209	292	0.948819	353	0.942641
49	0.981394	110	0.970761	171	0.961113	232	0.955209	293	0.948589	354	0.942485
50	0.981115	111	0.970689	172	0.961113	233	0.955134	294	0.948359	355	0.942485
51	0.980836	112	0.970617	173	0.961039	234	0.954983	295	0.948282	356	0.942173
52	0.980416	113	0.970545	174	0.960965	235	0.954832	296	0.948128	357	0.942017
53	0.980207	114	0.970473	175	0.960891	236	0.954681	297	0.948052	358	0.941783
54	0.980137	115	0.970329	176	0.960743	237	0.954530	298	0.947975	359	0.941705
55	0.979926	116	0.969968	177	0.960595	238	0.954455	299	0.947821	360	0.941627
56	0.979646	117	0.969824	178	0.960446	239	0.954228	300	0.947667	361	0.941549
57	0.979436	118	0.969679	179	0.960446	240	0.954228	301	0.947667	362	0.941549
58	0.979085	119	0.969607	180	0.960372	241	0.954077	302	0.947360	363	0.941315
59	0.978874	120	0.969390	181	0.960298	242	0.954077	303	0.947360	364	0.941315
60	0.978733	121	0.969101	182	0.960149	243	0.953925	304	0.947360		

[7] For more detailed post-transplant survival probabilities, see Policy 10.5, Table 10-9.