TALKING ABOUT TRANSPLANTATION

Questions and Answers for Transplant Professionals about

Lung Allocation

UNITED NETWORK FOR ORGAN SHARING

How does the lung allocation system work?

The lung allocation system determines the order in which lung offers are made to candidates awaiting transplantation based on estimates of each candidate's medical urgency prior to transplant and his or her probability of success following a transplant. This method is based on a "net benefit" concept. It gives priority for lung offers to the candidates who are most urgently in need of a transplant and who are expected to receive the greatest benefit.

The lung allocation system uses clinical information from individual lung transplant candidates ages 12 and older to help determine the order in which lung offers are made. This information includes lab values, test results, and disease diagnosis. The system uses this information in a formula that estimates candidates' medical urgency and their probability of survival following a transplant. These results are used to calculate a lung allocation score (LAS), ranging from 0 to 100, for each candidate. At the time a match is run, the LAS is used along with blood group, donor and candidate age, and distance from the donor hospital to determine the order for making offers to lung candidates. Lungs from pediatric (under 12 years old) and adolescent (12-17 years old) donors are offered first to pediatric and adolescent transplant candidates before they are offered to adults.

How are pediatric candidates prioritized for lung allocation?

Lung candidates under the age of 12 are not prioritized by LAS. Instead pediatric lung candidates are classified as Priority 1 or Priority 2 based on their medical condition. Those who meet the criteria reflecting a more urgent status are listed as a Priority 1. All other lung candidates in this

age range are Priority 2. The candidate's pediatric priority is used along with blood type and distance from the donor hospital to determine the order for making offers to lung candidates. Before a candidate turns 12, you need to enter the data required to calculate their LAS. When the candidate turns 12, the LAS will be used instead of pediatric priority to determine the order in which lung offers are made.

Pediatric Priority assigned based on this criteria:

Priority 1: Candidates that meet one or more of the following criteria:

Respiratory failure, defined as:

- Requiring continuous mechanical ventilation; or,
- Requiring supplemental oxygen delivered by any means to achieve FiO_2 greater than 50% in order to maintain oxygen saturation levels greater than 90%; **or,**
- Having an arterial or capillary PCO_2 greater than 50 mmHg, or a venous PCO_2 greater than 56 mmHg.

Pulmonary hypertension, defined as:

- Having pulmonary vein stenosis involving 3 or more vessels; or
- Exhibiting any of the following, in spite of medical therapy: suprasystemic PA pressure on cardiac catheterization or by echocardiogram estimate, cardiac index less than 2 L/min/m2, recurrent syncope, or hemoptysis

An exception case approved by the Lung Review Board

Priority 2: All other candidates that do not meet the criteria for Priority 1

How is waiting time used on the waiting list?

Waiting time plays a very limited role when allocating lungs to transplant candidates 12 years and older. Candidates receive lung offers based mainly on their LAS or pediatric priority for candidates younger than 12. When two or more lung candidates have the same LAS or pediatric priority and are in the same geographic zone, the length of time on the waiting list determines who receives the offer.

How are lung transplant candidates registered in the system?

When it is time to register a candidate for a lung transplant, you need to schedule them a complete transplant workup that includes tests and labs for the values listed on the chart (*see pg. 9–10)*. You will enter those values into UNet℠, the secure Internet-based system for organ allocation and data collection.

A variable that does not have an actual value or an approved estimated value will be considered incomplete. For most of the data variables, UNet will use a pre-determined value to calculate the score if the fields are left blank.

Four of the clinical data fields (lung diagnosis, date of birth, height, and weight) must be completed with an actual value or you will not be allowed to register the candidate on the waiting list. See the chart on pages 9–10 for a complete description of the clinical data requirements and the corresponding default values.

How often should I update a candidate's clinical data in UNet?

Because the lung allocation system determines priority for lung offers based on each candidate's clinical information, it is important that you enter the most current information in UNet.

You may update a candidate's clinical information in the system at any time to reflect a change in disease severity.

Transplant hospitals must update each candidate's information at least once every six months with intervals based on the date that the candidate is first registered. With the exception of values collected via heart catheterization, each value must have a collection date within the past six months or that variable field will be considered expired. Expired clinical values are replaced with a default value for that variable.

Example: If a candidate was first registered on the waiting list on January 1, 2014, and the most recent six-month anniversary was January 1, 2015, then any clinical variables older than July 1, 2014 will be considered expired.

For candidates with a LAS of 50 or higher, the transplant hospital must update information for the assisted ventilation, supplemental oxygen and current PCO_2 (if collected) every 14 days.

Updating data for candidates younger than 12: You must update your Priority 1 pediatric candidate's medical information at least once every six months. Six months after a candidate's anniversary date, and every six months thereafter, the system checks to see if a Priority 1 candidate's medical information has been updated in UNet. The anniversary date is the day the candidate was added to the waiting list. If the center has not updated a candidate's information within that six-month window, the candidate will revert to Priority 2 until you submit updated, qualifying information.

What if a candidate cannot undergo a diagnostic test?

Much of the clinical information that is needed to calculate the LAS comes from diagnostic tests, medical procedures, and lab values. There may be situations where a candidate's medical team determines that a candidate should not undergo tests or procedures because of the severity of his or her condition. In these situations, the center may submit a request to the Lung Review Board (LRB) to allow an estimated value to be used instead. The estimated value should represent the transplant physician's best medical judgment of what the actual value would be.

If a heart catheterization is required to obtain an actual value, the heart catheterization does not need to be repeated every six months. If a program performs a heart catheterization within a six-month reporting period, it must report the results in UNet. If heart catheterization is not an option for the candidate, the candidate will receive a default value for the clinical variables obtained by heart catheterization, or the transplant center may submit a request to use estimated values instead.

The LRB must review and approve an estimated value before it is used to calculate a candidate's LAS. Estimated values approved by the LRB will remain valid until they are updated with an actual value or another estimated value is approved.

Does donor age impact lung allocation?

Yes. Donor lungs are offered to candidates in different orders, depending on the age of the donor.

	Donor Age <12	Donor Age 12–17	Donor Age 18+
1	Age <12	Age 12–17	Age 12+
2	Age 12-17	Age <12	Age <12
3	Age 18+	Age 18+	

What if a transplant candidate has an exceptional situation that is not reflected by his or her lung allocation score or pediatric priority?

If a transplant physician or surgeon believes that a candidate's needs are not being met by the lung allocation system because of that candidate's exceptional characteristics, they may request that the LRB approve an LAS. Similarly, in the case of those candidates younger than 12, you may submit a Priority 1 exception request.

Transplant hospitals may submit a request to allow candidates less than 12 years old to have an additional adolescent registration and be prioritized according to their LAS while still maintaining their pediatric registration and pediatric priority. This exception allows the candidate to be prioritized with adolescent candidates for offers from adolescent and adult donors, while also being prioritized as a pediatric candidate for offers from pediatric donors.

How are transplant professionals impacted by the lung allocation system?

You need to monitor your candidates to keep their clinical information current in UNet, so that their LAS/pediatric priority statuses accurately reflect their condition. This involves tracking data collection dates and working with candidates to establish a visit schedule that will permit their data to be updated on time at least once every six months.

UNet will notify you in advance about those candidates whose diagnostic variables are nearing the six-month expiration date.

If you need assistance accessing or using UNet, contact UNOS Customer Service at **800-978-4334** or **unethelpdesk@unos.org.** The Organ Center is also available to assist you during nights and on weekends.

Candidates may have questions. Transplant professionals need to be knowledgeable about the features of the lung allocation system so that they may explain it to candidates and answer their questions.

UNOS' patient brochure, ***Questions and Answers for Transplant Candidates about Lung Allocation,*** is available on the UNOS website.

Will the lung allocation system change in the future?

This system was designed to be flexible and allow for improvements. In organ transplantation, as in all scientific fields, new studies are taking place all the time to learn how to save more lives and how to help people live longer and fuller lives. The lung allocation system is reviewed regularly. Adjustments are made to the way LAS is calculated to better meet the needs of transplant candidates.

Where is more information found?

An LAS calculator is available on the OPTN website for informational purposes. You will find the LAS calculator under Resources. Additional information about OPTN, UNOS and allocation policy is available on the following websites:

http://optn.transplant.hrsa.gov

www.unos.org

www.transplantpro.org

Lung Allocation Score and Clinical Data Requirements

Data variable	Required to add candidate to Waitlist	Value used if data are missing
Lung diagnosis	✓	
Date of birth Used to calculate age	✓	
Height and weight Used to calculate Body Mass Index	✓	
Bilirubin		0.7 mg/dL
Cardiac index prior to exercise		3.0 L/min/m2
Central venous pressure (mmHg) at rest, prior to exercise		5 mmHg
Ventilation status		No mechanical ventilation in waiting list model. Continuous mechanical ventilation while hospitalized in post-transplant survival model.
Creatinine (serum) (mg/dL) Applies for candidates 18 and older only		0.1 mg/dL in waiting list model. 40 mg/dL in post-transplant survival model.
Diabetes		No diabetes
Forced Vital Capacity		150% for Diagnosis Group D
Functional status		No assistance needed in waiting list model. Total assistance needed in post-transplant survival model.
Oxygen needed to maintain adequate oxygen saturation (88% or greater) at rest (L/min)		No oxygen needed in waiting list survival model. 26.33 L/min in post-transplant survival model.
PCO_2 (mmHg)		40 mmHg
Pulmonary artery systolic pressure (10 mmHg) at rest, prior to exercise		20 mmHg
Six-minute-walk distance (feet)		4,000 ft. in waiting list survival model. 0 ft. in post-transplant survival model.

Value used if data are expired	Value used if data are below threshold	Center may request estimated value
100 kg/m2		
0.7 mg/dL	0.7 mg/dL if actual value less than 0.7 mg/dL	
		✓
	5 mmHg if actual value less than 5 mmHg	✓
No mechanical ventilation in waiting list model. Continuous mechanical ventilation while hospitalized in post-transplant survival model.		
0.1 mg/dL in waiting list model. 40 mg/dL in post-transplant survival model.		
No diabetes		
150% for Diagnosis Group D		✓
No assistance needed in waiting list model. Total assistance needed in post-transplant survival model.		
No oxygen needed in waiting list survival model. 26.33 L/min in post-transplant survival model.		
40 mmHg	40 mmHg if actual value is less than 40 mmHg	
20 mmHg	20 mmHg if actual value is less than 20 mmHg	✓
4,000 ft. in waiting list survival model. 0 ft. in post-transplant survival model.		✓

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