

3.0 ORGAN DISTRIBUTION

The following policies apply to the allocation of organs for transplantation.

3.7 ALLOCATION OF THORACIC ORGANS. This policy describes how thoracic organs (hearts, heart-lung combinations, single and double lungs) are to be allocated to patients awaiting a thoracic organ transplant.

3.7.1 Exceptions. Unless otherwise approved according to Policies 3.1.7 (Local and Alternative Local Unit), 3.1.8 (Sharing Arrangement and Sharing Agreement), 3.1.9 (Alternate Point Assignments (Variances)), and 3.4.6 (Application, Review, Dissolution and Modification Processes for Alternative Organ Distribution or Allocation Systems), or specifically allowed by the exceptions described in this Policy 3.7.1, all thoracic organs must be allocated in accordance with Policy 3.7.

3.7.1.1 Exception for Sensitized Patients. The transplant surgeon or physician for a patient awaiting thoracic organ transplantation may determine that the patient is "sensitized" such that the patient's antibodies would react adversely to certain donor cell antigens. It is permissible not to use the allocation policies set forth in Policy 3.7 for allocation of a particular thoracic organ when all thoracic organ transplant centers within an OPO and the OPO agree to allocate the thoracic organ to a sensitized patient because results of a crossmatch between the blood serum of that patient and cells of the thoracic organ donor are negative (i.e., the patient and thoracic organ donor are compatible). The level of sensitization at which a patient may qualify for this exception is left to the discretion of the listing transplant center, and subject to agreement among all thoracic organ transplant centers within an OPO and the OPO. Sensitization is not a qualifying criterion for assigning a patient to a heart status category as described in UNOS Policies 3.7.3 (Adult Patient Status) and 3.7.4 (Pediatric Patient Status).

3.7.2 Geographic Sequence of Thoracic Organ Allocation. Thoracic organs are to be allocated locally first, then within the following zones in the sequence described in Policy 3.7.10 and Policy 3.7.11. Four zones will be delineated by concentric circles of 500, 1,000, and 1,500 nautical mile radii with the donor hospital at the center. Zone A will extend to all transplant centers which are within 500 miles from the donor hospital but which are not in the local area of the donor hospital. Zone B will extend to all transplant centers that are at least 500 miles from the donor hospital but not more than 1,000 miles from the donor hospital. Zone C will extend to all transplant centers that are located beyond 1,000 miles from the donor hospital. Zone D will extend to all transplant centers that are located beyond 1,500 miles from the donor hospital.

3.7.3 Adult Patient Status. Each patient awaiting heart transplantation is assigned a status code which corresponds to how medically urgent it is that the patient receive a transplant. Medical urgency is assigned to a heart transplant patient who is greater than or equal to 18 years of age at the time of listing as follows:

Status	Definition
--------	------------

1A	A patient listed as Status 1A is admitted to the listing transplant center hospital and has at least one of the following devices or therapies in place:
----	--

(a)	Mechanical circulatory support for acute hemodynamic decompensation that includes at least one of the following:
-----	--

(i)	left and/or right ventricular assist device implanted Patients listed under this criterion, may be listed for 30 days at any point after being implanted as Status 1A once the treating physician determines that they are clinically stable. Admittance to the listing transplant center hospital is not required.
-----	---

- (ii) total artificial heart;
- (iii) intra-aortic balloon pump; or
- (iv) extracorporeal membrane oxygenator (ECMO).

Qualification for Status 1A under criterion 1A(a)(ii), (iii) or (iv) is valid for 14 days and must be recertified by an attending physician every 14 days from the date of the patient's initial listing as Status 1A to extend the Status 1A listing.

- (b) Mechanical circulatory support with objective medical evidence of significant device-related complications such as thromboembolism, device infection, mechanical failure and/or life-threatening ventricular arrhythmias (Patient sensitization is not an appropriate device-related complication for qualification as Status 1A under this criterion. The applicability of sensitization to thoracic organ allocation is specified by UNOS Policy 3.7.1.1 (Exception for Sensitized Patients). Qualification for Status 1A under this criterion is valid for 14 days and must be recertified by an attending physician every 14 days from the date of the patient's initial listing as Status 1A to extend the Status 1A listing.
- (c) Continuous Mechanical ventilation. Qualification for Status 1A under this criterion is valid for 14 days and must be recertified by an attending physician every 14 days from the date of the patient's initial listing as Status 1A to extend the Status 1A listing.
- (d) Continuous infusion of a single high-dose intravenous inotrope (e.g., dobutamine ≥ 7.5 mcg/kg/min, or milrinone $\geq .50$ mcg/kg/min), or multiple intravenous inotropes, in addition to continuous hemodynamic monitoring of left ventricular filling pressures; Qualification for Status 1A under this criterion is valid for 7 days and may be renewed for an additional 7 days for each occurrence of a Status 1A listing under this criterion for the same patient.
- (e) ~~A patient who does not meet the criteria specified in (a), (b), (c) or (d) may be listed as Status 1A if the patient is admitted to the listing transplant center hospital and has a life expectancy without a heart transplant of less than 7 days. Qualification for Status 1A under this criterion is valid for 7 days and may be recertified by an attending physician for one additional 7 day period.~~

A patient who does not meet the criteria for Status 1A may nevertheless be assigned to such status upon application by his/her transplant physician(s) and justification to the applicable Regional Review Board that the patient is considered, using acceptable medical criteria, to have an urgency and potential for benefit comparable to that of other patients in this status as defined above. The justification must include a rationale for incorporating the exceptional case as part of the status criteria. The justification must be prospectively reviewed and approved by the Regional Review Board before the patient can be listed as Status 1A. A report of the decision of the Regional Review Board and the basis for it shall be forwarded to UNOS for review by the Thoracic Organ Transplantation Committee to determine consistency in application among and within Regions and continued appropriateness of the patient status criteria. A patient's listing under this exceptional provision is valid for 14 days.

Any further extension of the Status 1A listing under this criterion requires a conference with the applicable UNOS Regional Review Board prospective review and approval by a majority of the Regional Review Board Members. If Regional Review Board approval is not given, the patient's transplant physician may list the patient as Status 1A, subject to automatic referral to the Thoracic

Organ Transplantation and Membership and Professional Standards Committees.

For all adult patients listed as Status 1A, a completed Heart Status 1A Justification Form must be received by UNOS on UNetsm in order to list a patient As Status 1A, or extend their listing as Status 1A in accordance with the criteria listed above in Policy 3.7.3. Patients listed as Status 1A will automatically revert back to Status 1B unless they are re-listed on UNetsm by an attending physician within the time frames described in the definitions of status 1A(a)-(ed) above.

1B A patient listed as Status 1B has at least one of the following devices or therapies in place:

- (aa) left and/or right ventricular assist device implanted; or
- (bb) continuous infusion of intravenous inotropes.

For all adult patients listed as Status 1B, a completed Heart Status 1B Justification Form must be received by UNOS on UNetsm in order to list a patient within one working day of a patient's listing as Status 1B. A patient who does not meet the criteria for Status 1B may nevertheless be assigned to such status upon application by his/her transplant physician(s) and justification to the applicable Regional Review Board that the patient is considered, using accepted medical criteria, to have an urgency and potential for benefit comparable to that of other patients in this status as defined above. The justification must include a rationale for incorporating the exceptional case as part of the status criteria. A report of the decision of the Regional Review Board and the basis for it shall be forwarded to UNOS for review by the Thoracic Organ Transplantation and Membership and Professional Standards Committees to determine consistency in application among and within Regions and continued appropriateness of the patient status criteria.

2 A patient who does not meet the criteria for Status 1A or 1B is listed as Status 2.

7 A patient listed as Status 7 is considered temporarily unsuitable to receive a thoracic organ transplant.

Prior to downgrading any patients upon expiration of any limited term for any listing category, UNOS shall notify a responsible member of the relevant transplant team.

NOTE: Amendments to Policy 3.7.3 1A(e) (Adult Patient Status) shall be implemented pending programming on the UNOS system.

3.7.4 Pediatric Patient Status. Each patient awaiting heart transplantation is assigned a status code which corresponds to how medically urgent it is that the patient receive a transplant. Medical urgency is assigned to a heart transplant patient who is less than 18 years of age at the time of listing as follows: Pediatric heart transplant patients who remain on the waiting list at the time of their 18th birthday without receiving a transplant, shall continue to qualify for medical urgency status based upon the criteria set forth in Policy 3.7.4.

Status	Definition
--------	------------

1A	A patient listed as Status 1A meets at least one of the following criteria:
----	---

- (a) Requires assistance with a ventilator;

- (b) Requires assistance with a mechanical assist device (e.g., ECMO);
- (c) Requires assistance with a balloon pump;
- (d) A patient less than six months old with congenital or acquired heart disease exhibiting reactive pulmonary hypertension at greater than 50% of systemic level. Such a patient may be treated with prostaglandin E (PGE) to maintain patency of the ductus arteriosus;
- (e) Requires infusion of high dose (e.g., dobutamine > 7.5 mcg/kg/min or milrinone > .50 mcg/kg/min) or multiple inotropes (e.g., addition of dopamine at > 5 mcg/kg/min); or
- (f) A patient who does not meet the criteria specified in (a), (b), (c), (d), or (e) may be listed as Status 1A if the patient has a life expectancy without a heart transplant of less than 14 days, such as due to refractory arrhythmia. Qualification for Status 1A under this criterion is valid for 14 days and may be recertified by an attending physician for one additional 14-day period. Any further extension of the Status 1A listing under this criterion requires a conference with the applicable UNOS Regional Review Board.

Qualification for Status 1A under criteria (a) through (e) is valid for 14 days and must be recertified by an attending physician every 14 days from the date of the patient's initial listing as Status 1A to extend the Status 1A listing.

For all pediatric patients listed as Status 1A, a completed Heart Status 1A Justification Form must be received by UNOS on UNetsm in order to list a patient As Status 1A, or extend their listing as Status 1A in accordance with the criteria listed above in Policy 3.7.4. Patients who are listed as Status 1A will automatically revert back to Status 1B after 14 days unless these patients are re-listed on UNetsm as Status 1A by an attending physician within the time frames described in the definitions of status 1A(a)-(e) above

1B A patient listed as Status 1B meets at least one of the following criteria:

- (a) Requires infusion of low dose single inotropes (e.g., dobutamine or dopamine < 7.5 mcg/kg/min);
- (b) Less than six months old and does not meet the criteria for Status 1A; or
- (c) Growth failure *i.e.*, + 5th percentile for weight and/or height, or loss of 1.5 standard deviations of expected growth (height or weight) based on the National Center for Health Statistics for pediatric growth curves.

Note: This criterion defines growth failure as either < 5th percentile for weight and/or height, or loss of 1.5 standard deviation score of expected growth (height or weight). The first measure looks at relative growth as of a single point in time. The second alternative accounts for cases in which a substantial loss in growth occurs between two points in time. Assessment of growth failure using the standard deviation score decrease can be derived by, first, measuring (or using a measure of) the patient's growth at two different times, second, calculating the patient's growth velocity between these times, and, third, using the growth velocity to calculate the standard deviation score (*i.e.*, (patient's growth rate - mean growth rate for age and sex) divided by standard deviation of growth rate for age and sex).

For all pediatric patients listed as Status 1B, a completed Heart Status 1B Justification Form must be received by UNOS on UNetsm in order to list a patient as Status 1B. A patient who does not meet the criteria for Status 1B may nevertheless be assigned to such status upon application by his/her transplant physician(s) and justification to the applicable Regional Review Board that the patient is considered, using accepted medical criteria, to have an urgency and potential for benefit comparable to that of other patients in this status as defined above. The justification must include a rationale for incorporating the exceptional case as part of the status criteria. A report of the decision of the Regional Review Board and the basis for it shall be forwarded to UNOS for review by the Thoracic Organ Transplantation and Membership and Professional Standards Committees to determine consistency in application among and within Regions and continued appropriateness of the patient status criteria.

- 2 A patient who does not meet the criteria for Status 1A or 1B is listed as Status 2.
- 7 A patient listed as Status 7 is considered temporarily unsuitable to receive a thoracic organ transplant.

Prior to downgrading any patients upon expiration of any limited term for any listing category, UNOS shall notify a responsible member of the relevant transplant team.

3.7.5 Allocation of Adolescent Donor Hearts to Pediatric Heart Candidates. Within each heart status, a heart retrieved from an adolescent organ donor shall be allocated to a pediatric heart candidate (i.e., less than 18 years old at the time of listing) before the heart is allocated to an adult candidate. For the purpose of Policy 3.7, an adolescent organ donor is defined as an individual who is 11 years of age or older, but less than 18 years of age.

3.7.6 Status of Patients Awaiting Lung Allocation Transplantation. ~~All patients awaiting isolated lung transplantation are considered to be the same urgency status for the purposes of thoracic organ allocation. Candidates are assigned priority in lung allocation as follows:~~

3.7.6.1 Candidates Age 12 and Older. ~~Candidates age 12 and older are assigned priority for lung offers based upon Lung Allocation Score, which is calculated using the following measures: (i) waitlist urgency measure (expected number of days lived without a transplant during an additional year on the waitlist), (ii) post-transplant survival measure (expected number of days lived during the first year post-transplant), and (iii) transplant benefit measure (post-transplant survival measure minus waitlist urgency measure). Waitlist urgency measure and post-transplant survival measure (used in the calculation of transplant benefit measure) are developed using Cox proportional hazards models. Factors determined to be important predictors of waitlist mortality and post-transplant survival are listed below in Tables 1 and 2. It is expected that these factors will change over time as new data are available and added to the models. The OPTN/UNOS Thoracic Organ Transplantation Committee will review these data in regular intervals of approximately six months and will propose changes to Tables 1 and 2 as appropriate.~~

Table 1

**Factors Used to Predict
Risk of Death on the Lung Transplant Waitlist**

1. Forced vital capacity (FVC)
2. Pulmonary artery (PA) systolic (Group A, C, D)¹
3. O₂ required at rest (A, C, D)
4. Age
5. Body mass index (BMI)
6. Insulin dependent diabetes
7. Functional status (New York Heart Association (NYHA) class)
8. Six-minute walk distance
9. Ventilator use
10. Diagnosis

¹Group A includes candidates with obstructive lung disease, including without limitation, chronic obstructive pulmonary disease (COPD), alpha-1-antitrypsin deficiency, emphysema, lymphangiomyomatosis, bronchiectasis, and sarcoidosis with mean pulmonary artery (PA) pressure \leq 30 mmHg.

Group B includes candidates with pulmonary vascular disease, including without limitation, primary pulmonary hypertension (PPH), Eisenmenger's syndrome, and other uncommon pulmonary vascular diseases.

Group C includes, without limitation, candidates with cystic fibrosis (CF) and immunodeficiency disorders such as hypogammaglobulinemia.

Group D includes candidates with restrictive lung diseases, including without limitation, idiopathic pulmonary fibrosis (IPF), pulmonary fibrosis (other causes), sarcoidosis with mean PA pressure $>$ 30 mmHg, and obliterative bronchiolitis (non-retransplant).

Table 2

**Factors That Predict
Survival After Lung Transplant**

1. FVC (Group B, D)⁹
2. PCW pressure \geq 20 (Group D)⁹
3. Ventilator use
4. Age
5. Creatinine
6. Functional Status (NYHA class)
7. Diagnosis

The calculations define the difference between transplant benefit and waitlist urgency: Raw Allocation Score = Transplant Benefit Measure – Waitlist Urgency Measure.

Raw allocation scores range from -730 days up to +365 days, and are normalized to a continuous scale from 0 – 100 to determine Lung Allocation Scores. The higher the score, the higher the priority for receiving lung offers. Lung Allocation Scores are calculated to sufficient decimal places to avoid assigning the same score to multiple patients.

As an example, assume that a donor lung is available, and both Patient X and Patient Y are on the waiting list. Taking into account all diagnostic and prognostic factors, Patient X is expected to live 101.1 days during the following year without transplant. Also using available predictive factors, Patient X is expected to live 286.3 days during the following year if transplanted today. On the other hand, Patient Y is expected to live 69.2 days during the following year on the waitlist and 262.9 days post-transplant during the following year if transplanted today. Computationally, the proposed system would prioritize patients based on

the difference between each patient's transplant benefit measure and the waitlist urgency as measured by the expected days of life lived during the next year.

	Patient X	Patient Y
a. Post-transplant survival (days)	286.3	262.9
b. Waitlist survival (days)	101.1	69.2
c. Transplant benefit (a-b)	185.2	193.7
d. Raw allocation score (c-b)	84.1	124.5
e. Lung Allocation Score	74.3	78.0

In the example here, Patient X's raw allocation score would be 84.1 and Patient Y's raw allocation score would be 124.5.

Similar to the mathematical conversion of temperature from Fahrenheit to Centigrade, once the raw score is computed, it will be normalized to a continuous scale from 0-100 for easier interpretation by patients and caregivers (see formula above). A higher score on this scale indicates a higher priority for a lung offer. Conversely, a lower score on this scale indicates a lower priority for organ offers. Therefore, in the example above, Patient X's raw allocation score of 84.1 normalizes to a Lung Allocation Score of 74.3. Patient Y's raw score of 124.5 normalizes to a Lung Allocation Score of 78.0. As in the example of raw allocation scores, Patient Y has a higher Lung Allocation Score and will therefore receive a higher priority for a lung offer than Patient X that results in the lowest contribution to the Lung Allocation Score for that variable field will be selected for the candidate. Programs are permitted to override the system and enter a value deemed medically reasonable in the event a test needed to obtain an actual value for a variable cannot be performed due to the medical condition of a specific candidate. Use of the override feature results in an automatic review by the Thoracic Organ Transplantation Committee to determine whether the override values selected are appropriate and whether further action is warranted.

3.7.6.2 Candidates Age 0 - 11. Candidates 0 – 11 years old are assigned priority for lung offers based upon waiting time.

3.7.6.3 Candidate Variables in UNetsm. Entry into UNetsm of candidate clinical data responding to the variables shown in Tables 1 and 2 above, as they may be amended from time to time, is required when listing a candidate for lung transplantation. Candidates with no clinical data upon listing are assigned a Lung Allocation Score of zero, the score with the lowest priority. Candidates with incomplete clinical data upon listing are assigned a default value for each incomplete variable field. The value

3.7.6.3.1 Candidate Variables in UNetsm upon Implementation of Lung Allocation Scores Described in Policy 3.7.6. Candidates registered on the lung Waiting List at the time of implementation of the Lung Allocation Score described in Policy 3.7.6 with no or incomplete clinical data will receive a Lung Allocation Score of zero, the score with the lowest priority.

3.7.6.3.2 Updating Candidate Variables. Programs may update their candidates' clinical data at any time they believe a change in patient medical condition warrants such modification. Programs must update every candidate variable, except those candidate variables that are obtainable only by heart catheterization, for each candidate at least once every six months beginning on the date of initial listing on the lung waitlist. The frequency of updating those candidate variables that are obtainable only by heart catheterization will be left to the discretion of the transplant center.

Deleted: 3.7.6.3.2

3.7.6.4 Lung Candidates **With**

[Exceptional Cases. Special cases require review by the Lung Regional Review Board. The transplant center will accompany each request for special case review with a supporting narrative. The Thoracic Committee shall establish guidelines for special case review by the Lung RRB's.](#)

3.7.7 Allocation of Thoracic Organs to Heart-Lung Candidates. Candidates for a heart-lung transplant shall be registered on the individual UNOS Patient Waiting list for each organ. When the patient is eligible to receive a heart in accordance with Policy 3.7, or an approved variance to this policy, the lung shall be allocated to the heart-lung candidate from the same donor. When the patient is eligible to receive a lung in accordance with Policy 3.7, or an approved variance to this policy, the heart shall be allocated to the heart-lung candidate from the same donor if no suitable Status 1A isolated heart candidates are eligible to receive the heart.

3.7.8 ABO Typing for Heart Allocation. Within each heart status category, hearts will be allocated to patients according to the following ABO matching requirements:

- (i) Blood type O donor hearts shall only be allocated to blood type O or blood type B patients;
- (ii) Blood type A donor hearts shall only be allocated to blood type A or blood type AB patients;
- (iii) Blood type B donor hearts shall only be allocated to blood type B or blood type AB patients;
- (iv) Blood type AB donor hearts shall only be allocated to blood type AB patients.
- (v) If there is no patient available who meets these matching requirements, donor hearts shall be allocated first to patients who have a blood type that is compatible with the donor's blood type.

Following allocation for all born transplant candidates who have blood types that are compatible with donors hearts will be allocated locally first and then within zones in the sequence described in Policy 3.7.10, by heart status category to pediatric heart candidates less than one year of age who have a blood type that is incompatible with the donor's blood type if the candidate is listed with the blood type "Z" designation. Following allocation for incompatible pediatric heart candidates less than one year of age, hearts will be allocated, locally first and then within zones in the sequence described in Policy 3.7.10, to patients listed *in utero*.

3.7.8.1 Heart Allocation to Pediatric Candidates Registered Under Blood Type "Z". For pediatric candidates who will accept a heart from a donor of any blood type, the blood type "Z" designation may be added as a suffix to the actual blood type (e.g., "AZ") of a pediatric patient less than one year of age, or used alone if actual blood type is not known for *in utero* candidates.

3.7.8.2 ABO Typing for Lung Allocation. Patients who have the identical blood type as the donor and are awaiting an isolated lung transplant will be allocated thoracic organs before patients who have a compatible (but not identical) blood type with that of the donor and are awaiting an isolated lung transplant

3.7.9 Time Waiting for Thoracic Organ Candidates. Calculation of the time a patient has been waiting for a thoracic organ transplant begins with the date and time the patient is first registered as active on the UNOS Patient Waiting List. Waiting time will not be accrued by patients awaiting a thoracic organ transplant while they are registered on the UNOS Patient Waiting List as inactive. When time waiting is used for thoracic organ allocation, a patient will receive a preference over other patients who have accumulated less waiting time within

the same status category. ~~Where applicable,~~ ~~W~~waiting time accrued by a patient for a single thoracic organ transplant (heart or single lung) while waiting on the UNOS Patient Waiting List also may be accrued for a second thoracic organ, when it is determined that the patient requires a multiple thoracic organ (heart-lung or double lung) transplant. In addition, ~~where applicable,~~ waiting time accrued by a patient for a multiple thoracic organ transplant while waiting on the UNOS Patient Waiting List may be transferred to the waiting list for a single thoracic organ transplant.

3.7.9.1 Waiting Time Accrual for Heart Candidates. Patients listed as a Status 1A, 1B, or 2 will accrue waiting time within each heart status; however, waiting time accrued while listed at a lower status will not be counted toward heart allocation if the patient is upgraded to a higher status. For example, a patient who is listed as a Status 2 for 3 months and then is upgraded to a Status 1A for one week will accrue one week of waiting time as a Status 1A. If the patient is downgraded to a Status 2 for another 3 weeks, then the patient will have 4 months of total accrued time. If the patient subsequently is upgraded for another week as a Status 1A, then the patient's Status 1A waiting time will be 2 weeks.

3.7.9.2 Waiting Time Accrual for Lung Candidates Age 12 and Older Following Implementation of Lung Allocation Scores Described in Policy 3.7.6 with Idiopathic Pulmonary Fibrosis (IPF). ~~Waiting time accrued by lung candidates age 12 and older at the time of implementation of the Lung Allocation Score described in Policy 3.7.6 will be used to determine priority in lung allocation among candidates with Lung Allocation Scores of zero. A lung transplant candidate diagnosed with IPF shall be assigned 90 days of additional waiting time upon the candidate's registration on the UNOS Patient Waiting List~~

3.7.10 Sequence of Heart Allocation. Donor hearts shall be allocated in the following sequence in accordance with Policies 3.7.3, 3.7.4, 3.7.5, 3.7.7, 3.7.8, and 3.7.9:

Local

1. Status 1A patients
2. Status 1B patients
3. Status 2 patients

Zone A

4. Status 1A patients
5. Status 1B patients

Zone B

6. Status 1A patients
7. Status 1B patients

Zone A

8. Status 2 patients

Zone B

9. Status 2 patients

Zone C

10. Status 1A patients
11. Status 1B patients
12. Status 2 patients

Zone D

13. Status 1A patients

14. Status 1B patients
15. Status 2 patients

3.7.11 Sequence of Adult Donor Lung Allocation of Lungs. ~~Patients~~ Candidates age 12 and older awaiting a lung transplant whether it is a single lung transplant or a double lung transplant will be grouped together for adult (18 years old and older) donor lung allocation purposes. If one lung is allocated to a patient candidate needing a single lung transplant, the other lung will be then allocated to another patient candidate waiting for a single lung transplant.

Lungs from adult donors will first be offered to candidates age 12 and older, and then to candidates 0 – 11 years old. Lungs from adult donors will be allocated locally first, then to patientscandidates in Zone A, then to patientscandidates in Zone B, then to patientscandidates in Zone C, and finally to patientscandidates in Zone D. In each of those five geographic areas, patientscandidates will be grouped so that patientscandidates who have an ABO blood type that is identical to that of the donor are ranked according to applicable allocation priority; the lungs will be allocated in descending order to patientscandidates in that ABO identical type. If the lungs are not allocated to patientscandidates in that ABO identical type, they will be allocated in descending order according to applicable allocation priority to the remaining patientscandidates in that geographic area who have a blood type that is compatible (but not identical) with that of the donor. In summary, the allocation sequence for adult donor lungs is as follows:

- i. First locally to ABO identical patientscandidates age 12 and older according to Lung Allocation Score in descending order;
- ii. Next, locally to ABO compatible patientscandidates age 12 and older according to Lung Allocation Score in descending order;
- iii. Next, locally to ABO identical candidates 0 – 11 years old according to length of waiting time;
- iv. Next, locally to ABO compatible candidates 0 – 11 years old according to length of waiting time;
- v. Next, to ABO identical patientscandidates age 12 and older in Zone A according to Lung Allocation Score in descending order;
- vi. Next, to ABO compatible patientscandidates age 12 and older in Zone A according to Lung Allocation Score in descending order;
- vii. Next, to ABO identical candidates 0 – 11 years old in Zone A according to length of waiting time;
- viii. Next, to ABO compatible candidates 0 – 11 years old in Zone A according to length of waiting time;
- ix. Next, to ABO identical patientscandidates age 12 and older in Zone B according to Lung Allocation Score in descending order;
- x. Next, to ABO compatible patientscandidates age 12 and older in Zone B according to Lung Allocation Score in descending order;
- xi. Next, to ABO identical candidates 0 – 11 years old in Zone B according to length of waiting time;
- xii. Next, to ABO compatible candidates 0 – 11 years old in Zone B according to length of waiting time;
- xiii. Next, to ABO identical patientscandidates age 12 and older in Zone C according to Lung Allocation Score in descending order;
- xiv. Next, to ABO compatible patientscandidates age 12 and older in Zone C according to Lung Allocation Score in descending order;
- xv. Next, to ABO identical candidates 0 – 11 years old in Zone C according to length of waiting time;
- xvi. Next, to ABO compatible candidates 0 – 11 years old in Zone C according to length of waiting time;
- xvii. Next, to ABO identical patientscandidates age 12 and older in Zone D according to Lung Allocation Score in descending order;
- xviii. Next, to ABO compatible patientscandidates age 12 and older in Zone D according to Lung Allocation Score in descending order;

- xix. Next, to ABO identical candidates 0 – 11 years old in Zone D according to length of waiting time; and
- xx. Next, to ABO compatible candidates 0 – 11 years old in Zone D according to length of waiting time.

3.7.11.1 Sequence of Pediatric Donor Lung Allocation. Candidates 0 – 11 years old awaiting a single or double lung transplant will be grouped together for allocation purposes. If one lung is allocated to a candidate waiting for a single lung transplant, the other lung will be then allocated to another candidate waiting for a single lung transplant

Candidates 12 – 17 years old awaiting a single or double lung transplant will be grouped together for pediatric (0 – 17 years old) donor lung allocation. If one lung is allocated to a candidate waiting for a single lung transplant, the other lung will be then allocated to another candidate waiting for a single lung transplant.

Lungs from donors 0 – 11 years old will first be offered to candidates age 0 – 11; then to candidates age 12 – 17; then to candidates 18 years and older. Lungs will be allocated locally first, then to candidates in Zone A, then to candidates in Zone B, then to candidates in Zone C, and finally, to candidates in Zone D. In each of those five geographic areas, candidates will be grouped so that candidates who have an ABO blood type that is identical to that of the donor are ranked according to applicable allocation priority; the lungs will be allocated in descending order to candidates in that ABO identical type. If the lungs are not allocated to candidates in that ABO identical type, they will be allocated in descending order according to applicable allocation priority to the remaining candidates in that geographic area who have a blood type that is compatible (but not identical) with that of the donor. In summary, the allocation sequence for lungs from donors 0 11 years old is as follows:

- i. First locally to ABO identical candidates 0 – 11 years old according to length of time waiting;
- ii. Next, locally to ABO compatible candidates 0 – 11 years old according to length of time waiting;
- iii. Next, locally to ABO identical candidates 12 – 17 years old according to Lung Allocation Score in descending order;
- iv. Next, locally to ABO compatible candidates 12 – 17 years old according to Lung Allocation Score in descending order;
- v. Next, locally to ABO identical candidates 18 years old and older according to Lung Allocation Score in descending order;
- vi. Next, locally to ABO compatible candidates 18 years old and older according to Lung Allocation Score in descending order;
- vii. Next, to ABO identical candidates 0 – 11 years old in Zone A according to length of time waiting;
- viii. Next, to ABO compatible candidates 0 – 11 years old in Zone A according to length of time waiting;
- ix. Next, to ABO identical candidates 12 – 17 years old in Zone A according to Lung Allocation Score in descending order;
- x. Next, to ABO compatible candidates 12 – 17 years old in Zone A according to Lung Allocation Score in descending order;
- xi. Next, to ABO identical candidates 18 years old and older in Zone A according to Lung Allocation Score in descending order;
- xii. Next, to ABO compatible candidates 18 years old and older in Zone A according to Lung Allocation Score in descending order;
- xiii. Next, to ABO identical candidates 0 – 11 years old in Zone B according to length of time waiting;
- xiv. Next, to ABO compatible candidates 0 – 11 years old in Zone B according to length of time waiting;

- xv. Next, to ABO identical candidates 12 – 17 years old in Zone B according to Lung Allocation Score in descending order;
- xvi. Next, to ABO compatible candidates 12 – 17 years old in Zone B according to Lung Allocation Score in descending order;
- xvii. Next, to ABO identical candidates 18 years old and older in Zone B according to Lung Allocation Score in descending order;
- xviii. Next, to ABO compatible candidates 18 years old and older in Zone B according to Lung Allocation Score in descending order;
- xix. Next, to ABO identical candidates 0 – 11 years old in Zone C according to length of time waiting;
- xx. Next, to ABO compatible candidates 0 – 11 years old in Zone C according to length of time waiting;
- xii. Next, to ABO identical candidates 12 – 17 years old in Zone C according to Lung Allocation Score in descending order;
- xxii. Next, to ABO compatible candidates 12 – 17 years old in Zone C according to Lung Allocation Score in descending order;
- xxiii. Next, to ABO identical candidates 18 years old and older old in Zone C according to Lung Allocation Score in descending order;
- xxiv. Next, to ABO compatible candidates 18 years old and older in Zone C according to Lung Allocation Score in descending order;
- xxv. Next, to ABO identical candidates 0 – 11 years old in Zone D according to length of time waiting;
- xxvi. Next, to ABO compatible candidates 0 – 11 years old in Zone D according to length of time waiting;
- xxvii. Next, to ABO identical candidates 12 – 17 years old in Zone D according to Lung Allocation Score in descending order;
- xxviii. Next, to ABO compatible candidates 12 – 17 years old in Zone D according to Lung Allocation Score in descending order;
- xxix. Next, to ABO identical candidates 18 years old and older in Zone D according to Lung Allocation Score in descending order; and
- xxx. Next, to ABO compatible candidates 18 years old and older in Zone D according to Lung Allocation Score in descending order.

Lungs from donors 12 – 17 years old will first be offered to candidate s age 12 – 17 years old; then to candidates age 0 – 11; then to candidates 18 years and older. Lungs will be allocated locally first, then to candidates in Zone A, then to candidates in Zone B, then to candidates in Zone C, and finally, to candidates in Zone D. In each of those five geographic areas, candidates will be grouped so that candidates who have an ABO blood type that is identical to that of the compatible (but not identical) with that of the donor. In summary, the allocation sequence for lungs from donors 12 – 17 years old is as follows:

- i. First locally to ABO identical candidates 12 – 17 years old according to Lung Allocation Score in descending order;
- ii. Next, locally to ABO compatible candidates 12 – 17 years old according to Lung Allocation Score in descending order;
- iii. Next, locally to ABO identical candidates 0 – 11 years old according to length of time waiting;
- iv. Next, locally to ABO compatible candidates 0 – 11 years old according to length of time waiting;
- v. Next, locally to ABO identical candidates 18 years old and older according to Lung Allocation Score in descending order;
- vi. Next, locally to ABO compatible candidates 18 years old and older according to Lung Allocation Score in descending order;
- vii. Next, to ABO identical candidates 12 – 17 years old in zone A according to Lung Allocation Score in descending order;
- viii. Next, to ABO compatible candidates 12 – 17 years old in zone A according to Lung Allocation Score in descending order;
- ix. Next, to ABO identical candidates 0 – 11 years old in Zone A according to length of time waiting;

- x. Next, to ABO compatible candidates 0 – 11 years old in Zone A according to length of time waiting;
- xi. Next, to ABO identical candidates 18 years old and older in Zone A according to Lung Allocation Score in descending order;
- xii. Next, to ABO compatible candidates 18 years old and older in Zone A according to Lung Allocation Score in descending order;
- xiii. Next, to ABO identical candidates 12 – 17 years old in zone B according to Lung Allocation Score in descending order;
- xiv. Next, to ABO compatible candidates 12 – 17 years old in zone B according to Lung Allocation Score in descending order;
- xv. Next, to ABO identical candidates 0 – 11 years old in Zone B according to length of time waiting;
- xvi. Next, to ABO compatible candidates 0 – 11 years old in Zone B according to length of time waiting;
- xvii. Next, to ABO identical candidates 18 years old and older in Zone B according to Lung Allocation Score in descending order;
- xviii. Next, to ABO compatible candidates 18 years old and older in Zone B according to Lung Allocation Score in descending order;
- xix. Next, to ABO identical candidates 12 – 17 years old in zone C according to Lung Allocation Score in descending order;
- xx. Next, to ABO compatible candidates 12 – 17 years old in zone C according to Lung Allocation Score in descending order;
- xxi. Next, to ABO identical candidates 0 – 11 years old in Zone C according to length of time waiting;
- xxii. Next, to ABO compatible candidates 0 – 11 years old in Zone C according to length of time waiting;

- xxiii. Next, to ABO identical candidates 18 years old and older old in Zone C according to Lung Allocation Score in descending order;
- xxiv. Next, to ABO compatible candidates 18 years old and older in Zone C according to Lung Allocation Score in descending order;
- xxv. Next, to ABO identical candidates 12 – 17 years old in zone D according to Lung Allocation Score in descending order;
- xxvi. Next, to ABO compatible candidates 12 – 17 years old in zone D according to Lung Allocation Score in descending order;
- xxvii. Next, to ABO identical candidates 0 – 11 years old in Zone D according to length of time waiting;
- xxviii. Next, to ABO compatible candidates 0 – 11 years old in Zone D according to length of time waiting;
- xxix. Next, to ABO identical candidates 18 years old and older in Zone D according to Lung Allocation Score in descending order; and
- xxx. Next, to ABO compatible candidates 18 years old and older in Zone D according to Lung Allocation Score in descending order.

NOTE: The amendments to Policy 3.7.6 (Lung Allocation, Policy 3.7.9 (Time Waiting for Thoracic Organ Candidates), and 3.7.11 (Sequence of Adult Donor Lung Allocation) shall be implemented following programming on the UNOS System.

3.7.12 Minimum Information for Thoracic Organ Offers.

3.7.12.1 Essential Information. The Host OPO or donor center must provide the following donor information to the recipient center with each thoracic organ offer:

- (i) The cause of brain death;
- (ii) The details of any documented cardiac arrest or hypotensive episodes;
- (iii) Vital signs including blood pressure, heart rate and temperature;
- (iv) Cardiopulmonary, social, and drug activity histories;
- (v) Pre- or post-transfusion serologies as indicated in 2.2.7.1 (pre-transfusion

- preferred);
- (vi) Accurate height, weight, age and sex;
- (vii) ABO type;
- (viii) Interpreted electrocardiogram and chest radiograph;
- (ix) History of treatment in hospital including vasopressors and hydration;
- (x) Arterial blood gas results and ventilator settings; and
- (xi) Echocardiogram, if the donor hospital has the facilities.

The thoracic organ procurement team must have the opportunity to speak directly with responsible ICU personnel or the on-site donor coordinator in order to obtain current first-hand information about the donor physiology.

3.7.12.2 Desirable Information for Heart Offers. With each heart offer, the donor center is encouraged to provide the recipient center with the following information:

- (i) Coronary angiography for male donors over the age of 40 and female donors over the age of 45;
- (ii) CVP or Swan Ganz instrumentation ;
- (iii) Cardiology consult; and
- (iv) Cardiac enzymes including CPK isoenzymes.

With each heart offer, it is reasonable for the transplanting center to request a heart catheterization of the donor where the donor history reveals one or more of the following:

- (a) The donor is a male over the age of 40 or a female over the age of 45;
- (b) Segmental wall motion abnormality;
- (c) Troponin elevation;
- (d) History of chest pain;
- (e) Abnormal EKG consistent with ischemia or myocardial infarction; or
- (f) Two or more of the following:
 - i. History of hypertension
 - ii. History of significant smoking
 - iii. Intra-cerebral bleed
 - iv. Strong family history of coronary artery disease
 - v. History of Hyperlipidemia
 - vi. History of diabetes
 - vii. History of cocaine or amphetamine use

3.7.12.3 Essential Information for Lung Offers. In addition to the essential information specified above for a thoracic organ offer, the Host OPO or donor center shall provide the following specific information with each lung offer:

- (i) Arterial blood gases on 5 cm/H₂O/PEEP including PO₂/FiO₂ ratio and preferably 100% FiO₂ within 2 hours prior to the offer;
- (ii) Bronchoscopy results. Bronchoscopy of a lung donor is recognized as an important element of donor evaluation, and should be arranged by the Host OPO or donor center. If the Host OPO or donor center lacks the personnel and/or technical capabilities to comply, the bronchoscopy responsibility will be that of the recipient center. The inability of the Host OPO or donor center to perform a bronchoscopy must be documented. Confirmatory bronchoscopy may be performed by the lung retrieval team provided unreasonable delays are avoided. A lung transplant program may not insist upon performing its own bronchoscopy before being subject to the 60 minute response time limit

- as specified in Policy 3.4.1;
- (iii) Chest radiograph interpreted by a radiologist or qualified physician within 3 hours prior to the offer;
- (iv) Sputum gram stain with a description of the sputum character; and
- (v) Smoking history.

3.7.12.4 Desirable Information for Lung Offers. With each lung offer, the Host OPO or donor center is encouraged to provide the recipient center with the following information:

- (i) Mycology smear; and
- (ii) Measurement of chest circumference in inches or centimeters at the level of the nipples and x-ray measurement vertically from the apex of the chest to the apex of the diaphragm and transverse at the level of the diaphragm, if requested.

3.7.13 Status 1 Listing Verification. A transplant center which has demonstrated noncompliance with the Status 1 criteria specified in UNOS Policy 3.7.3 (Primary Allocation Criteria) for heart candidate registration shall be audited on a random basis and any recurrence of noncompliance will result in a recommendation to the Membership and Professional Standards Committee and Executive Committee that further Status 1 heart candidate registrations from that center shall be subject to verification by UNOS of the candidates' medical status prior to their Status 1 placement on the UNOS waiting list for a period of one year.

3.7.14 Removal of Thoracic Organ Transplant Candidates from Thoracic Organ Waiting Lists When Transplanted or Deceased. If a heart, lung, or heart-lung transplant candidate on the UNOS Patient Waiting List has received a transplant from a deceased or living donor, or has died while awaiting a transplant, the listing center, or centers if the patient is multiple listed, shall immediately remove that patient from all thoracic organ waiting lists for that transplanted organ and shall notify UNOS within 24 hours of the event. If the thoracic organ recipient is again added to a thoracic organ waiting list, waiting time shall begin as of the date and time the patient is relisted.

3.7.15 Local Conflicts Involving Thoracic Organ Allocation. Regarding allocation of hearts, lungs and heart-lung combinations, locally unresolvable inequities or conflicts that arise from prevailing OPO policies may be submitted by any interested local member for review and adjudication to the UNOS Thoracic Organ Transplantation Committee and the UNOS Board of Directors.

3.7.16 Allocation of Domino Donor Hearts. A domino heart transplant occurs when the native heart of a combined heart-lung transplant recipient is procured and transplanted into a patient who requires an isolated heart transplant. First consideration for donor hearts procured for this purpose will be given to the patients of the participating transplant program from which the native heart was procured. If the program elects not to use the heart, then the heart will be allocated according to UNOS Policy 3.7, or an approved variance to this policy. For the purpose of Policy 3.7.16, the Local Unit of allocation for the domino heart shall be defined as the HCFA-designated service area of the OPO where the domino heart is procured.

3.7.17 Crossmatching for Thoracic Organs. The transplant program and its histocompatibility laboratory must have a joint written policy that states when a crossmatch is necessary. Guidelines for policy development, including assigning risk and timing of crossmatch testing, are set out in Appendix D of Policy 3.

NOTE: New Policy 3.7.17 (Crossmatching for Thoracic Organs) shall be effective January 1, 2005.