Public Comment Proposals

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ORGAN PROCUREMENT AND TRANSPLANTATION NETWORK OPTN

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OPTN

Public Comment Proposal

Guidance and Policy Clarifications Addressing Adult Heart Allocation Policy

OPTN Heart Transplantation Committee

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Guidance and Policy Clarifications Addressing Adult Heart Allocation Policy

Affected Policies:	*Policy 6.1.A.ii: Non-dischargeable, surgically implanted, non-endovascular biventricular support device* *Policy 6.1.C.vi: Mechanical Support Device with Infection* *Policy 6.1.D.ii: Inotropes without Hemodynamic Monitoring*
Sponsoring Committee:	*Heart Transplantation*
Public Comment Period:	*August 4, 2020 – October 1, 2020*

Executive Summary

On October 18, 2018, the Organ Procurement and Transplantation Network (OPTN) implemented modifications to the adult heart allocation system.[1] The number of candidates in the most medically urgent status classification had grown substantially since the last major policy modifications implemented in 2006. Candidates at that status had higher waiting list mortality than the other statuses. In addition, there was substantial variation in waiting list mortality among the candidates within the highest status.

A primary goal of the 2018 modifications was "to better stratify the most medically urgent heart transplant candidates."[2] In order to do that, the OPTN Board of Directors (Board) approved the creation of more granular statuses to ensure that the sickest candidates have access to donor hearts first. The additional classifications and criteria were expected to also reduce the need for transplant programs to submit exception applications, which had also grown substantially since the 2006 changes.

Despite the modifications, the number of exception requests submitted following implementation has not decreased.[3] In 2019, the OPTN Thoracic Organ Transplantation Committee (the Heart Transplantation Committee was established on July 1, 2020. Hereafter, the Committee) agreed to develop guidance material to help educate the community about the use of exception requests.

While developing the guidance material, the Committee identified opportunities to clarify other parts of policy. This proposal contains policy and guidance changes designed to improve and clarify components of existing adult heart allocation policy.

- Policy: The Committee identified opportunities to amend certain policy language involving the timing of when certain hemodynamic data should be reported, and the number of extension days available for certain statuses and conditions. From time-to-time, members have raised questions about aspects of these policies since implementation in 2018. One of the policy changes will require the submission of new data elements.

[1] OPTN, Policy Notice, Additional Clarifications to the Adult Heart Allocation System Policy Language. Accessed April 13, 2020. https://optn.transplant.hrsa.gov/media/2538/thoracic_policynotice_201807_heart.pdf
[2] OPTN, *Briefing Paper, Proposal to Modify the Adult Heart Allocation System*, December 2016, p. 1.
[3] OPTN, *Proposal to Modify the Adult Heart Allocation System*, p. 2, and OPTN, *One Year Monitoring of the Heart Allocation Proposal to Modify the Heart Allocation System*, February 20, 2020, Table 14, p. 64. Note: Comparison based on exceptions per month for identified periods.

- Guidance: The proposed guidance seeks to clarify the types and amount of information needed for heart Regional Review Board (RRB) members to objectively evaluate an exception request for a candidate being supported by the temporary therapies of a Percutaneous Endovascular Mechanical Circulatory Support Device (MCSD) or an Intra-Aortic Balloon Pump (IABP). The guidance focuses on improving the usefulness of the information in the clinical narratives of such patients. The guidance document does not create or change OPTN policy.

Background

In December 2016, the OPTN Board approved changes to heart allocation policy. [4] The changes increased the number of adult heart statuses from three to six in order to better stratify the most medically urgent patients based on their conditions. The changes were implemented in October 2018, and represented the first major amendments to the adult heart allocation system in about a decade.

Prior to the OPTN Board's actions in December 2016, adult heart allocation policy categorized candidates as Status 1A (the most medically urgent), Status 1B, or Status 2. However, the number of candidates listed at Status 1A had ballooned since 2006, making it difficult to separate patient's by the severity of their illness. From July 31, 2006 to November 30, 2015, the number of candidates listed at the highest status, Status 1A, had grown from 58 to 376.[5] Candidates within the status had varying degrees of medical urgency as defined by waiting list mortality. As a result, the Committee recommended creating three additional heart statuses. In addition to creating the additional criteria, the Committee sought to define more specifically the qualifying criteria based on physiological characteristics.

While developing the allocation changes, the Committee found that within Status 1A candidates had disparate waiting list mortality rates based on specific medical conditions.[6] The Committee also determined that some candidate groups did not fall neatly into any of the statuses, and were forced to rely on exception requests to address their needs. Furthermore, the Committee used the policy changes to address the increased use of Mechanical Circulatory Support Devices (MCSD) by transplant programs.

Issues Identified With OPTN Heart Allocation Policy

In 2019, the Committee identified two policies from 2018 for additional amendments. The first involves *Policy 6.1.D.ii: Inotropes without Hemodynamic Monitoring*. The 2018 modifications require that a candidate's cardiac index be less than 2.2. L/min/m^2 within seven days of submission of the justification form[7]. Some transplant programs questioned why the date the cardiac index was measured was being associated with form submission instead of the start of inotropic therapy.[8] A transplant program submitted the following:

> *We did not feel it was in the patient's best interest to stop the inotropes, precipitate decompensation and risk worsening renal function or worse, cardiogenic shock and possible inability to recover [the candidate]*

Transplant program staff point out that inotrope administration is likely to stabilize a candidate's condition.[9] However, for the candidate to meet the cardiogenic shock requirements within seven days of form submission, the transplant program may need to remove the candidate from the inotropes.

[4] OPTN, *Proposal to Modify the Adult Heart Allocation System*.
[5] IBID, p. 2.
[6] IBID, p. 2.
[7] OPTN, *Policy 6.1.D.ii: Inotropes without Hemodynamic Monitoring*.
[8] OPTN, *Modifications to the Adult Heart Allocation System: Frequently Asked Questions*, question 11, p. 7. Accessed June 28, 2020. https://optn.transplant.hrsa.gov/media/2688/adult-heart_revised-faq_20181008.pdf
[9] OPTN, *Proposal to Modify the Adult Heart Allocation System*, p. 11

Furthermore, the monitoring might require an invasive, right-heart catheterization procedure that puts the candidate at further risk. Possible risks include bruising where the catheter is inserted and potential for puncturing the vein during insertion and resulting excessive bleeding. Other, rarer complications can occur, including a pulmonary artery rupture, or even air leaking into the heart or chest area, that could lead to death.[10] In addition, for candidates who have been receiving inotropic therapy, the program may have to stop the therapy in order for the candidate to experience cardiogenic shock again.

A transplant program may choose not to perform a right-heart catheterization, or to attempt to wean a candidate from a medication in order to capture the cardiac index value if the candidate is in a stable condition. In such circumstances, a transplant program may consider requesting an exception or listing the candidate at another status. However, as previously discussed, relying on an exception request is not optimal for a candidate. First, it is up to the discretion of the transplant program if they want to submit an exception request. Second, exception requests must be approved by a RRB, increasing the potential that a candidate will not be assigned to the appropriate status. Likewise, listing a candidate at a lower status is not optimal either because the lower status may not provide the appropriate level of support needed by the candidate while awaiting transplant.[11] From October 18, 2018 through October 17, 2019, 240 candidates were added to the waitlist at Status 4 under the Inotropes without Hemodynamic Monitoring criteria.[12]

The Committee also considered increasing the initial qualifying and extension timeframes associated with assigning a patient to Status 4 as a result of *Policy 6.1.D.ii*. Such candidates can remain at the status for up to 90 days from submission of the Heart Status 4 Justification Form. After the initial 90 days, the status can be extended by the transplant program every 90 days by submission of another Heart Status 4 Justification Form.

Based on the potential invasiveness associated with measuring cardiac index, the Committee considered how frequently the value is needed. In the post-implementation period evaluated in the one-year monitoring report, median days to transplant for Status 4 candidates was 262 days.[13] Under the pre-2018 allocation system, candidates considered similar to those in Status 4 now were allowed to remain at a similar status for an almost indefinite amount of time. For comparisons of pre- and post-implementation medical urgency statuses, Status 1B in the pre-implementation phase can be approximated with Statuses 4 and 5 in the post-implementation period.[14] Under the previous policy framework, a candidate who qualified for Status 1B was permitted to retain the status "for an unlimited period."[15] Moreover, a transplant program could extend a candidate's time at Status 1B without providing any new documentation. Several Committee members cited their own program's protocols establishing 180 days as the timeframe between right heart catheterizations.

If implemented, the proposed changes will require the OPTN to begin collecting new data fields on the Adult Heart Status 4 Justification Form. Currently, a transplant program must provide the dosage

[10] Johns Hopkins Medicine, *Right Heart Catheterization*, June 2020, Available at https://www.hopkinsmedicine.org/health/treatment-tests-and-therapies/right-heart-catheterization
[11] OPTN, Review Board Guidance for Hypertrophic/Restrictive (HCM/RCM) Cardiomyopathy Exception Requests, October 18, 2018, pp. 1 and 9, Available at https://optn.transplant.hrsa.gov/media/2637/thoracic_guidance_review_board_hcm_rcm_201806.pdf
[12] OPTN, *One-Year Monitoring of the Heart Allocation Proposal*, Table 2, p. 13.
[13] OPTN, "One-Year Monitoring Report on Revisions to the Adult Heart Allocation System," Presentation to Thoracic Organ Transplantation Committee, February 27, 2020, slide 14.
[14] OPTN, *One-Year Monitoring of the Heart Allocation Proposal*, p. 5.
[15] OPTN, *Proposal to Modify the Adult Heart Allocation System*, p. 43.

amount associated with the inotrope or inotropes administered to the patient. A program must also provide the values for the cardiac index and pulmonary capillary wedge pressure and the test dates of when the values were recorded. The test date provided for the cardiac index is validated to ensure it occurred within seven days prior to the date the justification form was submitted. If the provided test date is outside of the acceptable range, the transplant program will not be able to continue completing the justification form.

Under the proposed changes, a transplant program must still report the dosage associated with the inotrope or inotropes administered to the patient. However, a program will also need to provide the date indicating when the inotrope was first administered. The date will be validated against the test date provided by the program for the cardiac index to ensure the dates are within seven days of each other. The four additional data fields, a date field associated with each of the four listed inotropic treatments, are the only new data collection associated with the proposal. Similar date fields exist on the Adult Heart Status 3 Justification Form for candidates to qualify for *Policy 6.1.C.v: MCSD with Right Heart Failure*.

Also considered were the initial qualifying periods and extension periods associated with Policy *6.1.A.ii: Non-dischargeable, Surgically Implanted, Non-Endovascular Biventricular Support Devices.* A candidate assigned to this status and type of therapy initially qualifies for up to 14 days. A transplant program can extend a candidate using this criteria for up to an additional 14 days. The criteria for this therapy were created as part of the 2018 modifications. The Committee agreed to limit who could qualify for Status 1 when supported by a device that was not approved by the Federal Drug Administration (FDA) for use outside of a hospital to those with biventricular support devices.[16] The policy changes also created a status criterion in Status 2 for those candidates supported by Left Ventricular Assist Devices (LVAD) that are not approved by the FDA for use outside of the hospital. Both status criterion established 14 days as both the initial qualifying period and the extension period.

The Committee agreed that the Status 1 criterion would be more appropriate as seven days to distinguish it from the criterion established in Status 2. Furthermore, establishing the qualifying and extension periods as seven days better aligns it with the timeframes established in *Policy 6.1.A.i: Veno-Arterial Extra Corporeal Membrane Oxygenation (VA ECMO)*.

2018 Policy Changes Have Not Reduced Exception Request Volume

In addition to creating new statuses, the policy changes implemented in 2018 created additional qualifying criteria for the most urgent statuses.[17] Additional qualifying criteria were established for Status 1 under the VA ECMO criteria, Status 2 under the Percutaneous Endovascular MCSD and the IABP, and Status 3 under the multiple inotropes with hemodynamic monitoring criteria. Policy required that the therapies be used to treat cardiogenic shock.

The proposed policy changes were expected to better account for relative waiting list mortality rates of all candidate groups. This included those candidates forced to apply for policy exceptions, and would treat those patients more equitably.[18] However, data on the number of exception requests leading up to

[16] OPTN, *Proposal to Modify the Adult Heart Allocation System*, p. 12
[17] IBID, p. 10.
[18] OPTN, *Modifications to the Adult Heart Allocation System*, question 11, p. 7.

and following the policies changes suggest that there was no reduction in the use of exceptions requests.

During development of the 2018 policy changes, the Committee members agreed that a major problem of the allocation system was the use of too many exception requests.[19] For example, it was reported that between January 2014 and December 2015, transplant programs submitted a total of 5,878 Status 1A and Status 1B exceptions requests (5,340 Status 1A exception requests and 538 Status 1B exception requests). This works out to 245 exception requests per month based on 22 months.

Status 1A in the previous system is roughly equivalent to Statuses 1, 2, and 3 in the new allocation system. Statuses 4 and 5 in the new allocation system are roughly equivalent to Status 1B in the previous system. Information provided in the One-Year Monitoring Report of the new adult heart allocation system found that during the 14 months spanning September 2018 through October 2019, a total of 3,711 exception requests were submitted for candidates listed at adult Statuses 1, 2, 3, or 4. (Exception requests are not available for Status 5 under current policy). This works out to about 265 exception requests per month.

The current Committee was concerned by the lack of reduction in exception requests. On top of those concerns, the Committee members were also aware that during development of the previous policy, the initial and extension timeframes associated with certain temporary therapies were criticized for being too long and incentivizing transplant programs to leave their candidates on the temporary support longer than necessary.[20] In light of these concerns, they decided to focus on addressing the use of Status 2 exception requests. The members agreed that clarifying what information should be provided as part of an exception request could be beneficial without having to revise policy.

This is particularly true regarding Status 2 exception requests. For example, in the year following implementation, the percentage of adult heart waiting list additions qualifying by an exception at time of listing was greatest for adult Status 2 (**Table 1**).[21] Of the 722 candidates listed at Status 2, 227 (31%) qualified by exception rather than the criteria established in policy.[22]

Table 1: Adult Heart Waiting List Additions With an Exception for Statuses 1 – 4 at Listing Post-implementation (October 18, 2018 – October 17, 2019)

Adult Status	Number of Waiting List Additions With an Exception	Total Number of Waitlist Additions	Percentage of Waitlist Additions by Exception
1	32	168	19.05%
2	227	722	31.44%
3	86	483	17.81%
4	249	1,581	15.75%

Concerned by what was perceived as a still large volume of exception requests for listing at Status 2,as opposed to qualifying by the criteria established in policy, the Committee looked more closely at the reasons for exceptions. During August 2019, Committee leadership reviewed the redacted clinical

[19] OPTN, *Proposal to Modify the Adult Heart Allocation System*, p.2
[20] OPTN, *Proposal to Modify the Adult Heart Allocation System*, p. 11
[21] OPTN, *One Year Monitoring of the Heart Allocation Proposal,* Table 2, p. 12.
[22] IBID, Table 2, p. 12.

narratives of more than 200 adult heart Status 2 exception requests submitted from June 1 through July 31, 2019. They included both initial exception requests and extension exception requests.

While the review only examined thirty days' worth of exception requests and was mainly exploratory in nature, some trends were identified, suggesting transplant programs could benefit from a guidance document. The review found some requests were lacking certain hemodynamic data that the reviewers believed was baseline information that should have been included, while others contained no hemodynamic data at all. Other requests included clinical narratives that provided hemodynamics that were not appropriate based on policy for the status being requested, such as systolic blood pressure greater than 90 mmHg or pulmonary capillary wedge pressure less than 15 mmHg. Furthermore, some of the clinical narratives reviewed met the criteria associated with hypertrophic/restrictive cardiomyopathy or adult congenital heart disease for which guidance exists[23] but did not reference the guidance and potentially missed an opportunity for the candidate to qualify for the status being requested.

The reviewers expressed concern that the information being provided in the exceptions they reviewed was not adequate for a hypothetical review board member to make a decision. While exceptions exist to address those instances where a candidate does not meet the criteria established in policy, the transplant program is supposed to use objective evidence to demonstrate that a candidate has at least the same medical urgency as other candidates in that status, and the same potential for benefit. The reviewers believed that programs were not providing enough information or the correct types of information to demonstrate their candidate had the same medical urgency.

In evaluating exception requests, the RRB members are tasked with determining whether a "candidate has an urgency and potential for benefit comparable to that of other candidates at the requested status."[24] When submitting an exception request, a transplant program is supposed to demonstrate the similar urgency and potential benefit using acceptable medical criteria.[25] However, the policy does not define what constitutes acceptable criteria.

Nonetheless, RRBs approved more than 90 percent of the Status 2 exception requests submitted in the year following implementation of the new allocation policy.[26] The lack of guidance pertaining to what information should be included in the narrative likely results in wide variability of the detail and appropriateness of requests. This makes it difficult for RRB members to make consistent decisions.

Members of the Committee indicated that the one-year monitoring report findings reinforced the Committee's efforts addressing Status 2 exceptions for candidates supported by Percutaneous Endovascular MCSD and IABP through a guidance document that helps to: standardize exception requests for Status 2 candidates supported by these temporary therapies; clarify criteria indicative of VAD contraindications; ensure that patients are only placed on Percutaneous Endovascular MCSD or IABP when those therapies are most appropriate; and provide structure for clarity needed by RRB members to evaluate.[27]

[23] OPTN, *Review Board Guidance for Hypertrophic/Restrictive (HCM/RCM) Cardiomyopathy Exception Requests*, and OPTN, *Review Board (RB) Guidance for Adult Congenital Heart Disease (CHD) Exception Requests*.
[24] OPTN, *Policy 6.4: Adult and Pediatric Status Exceptions.*
[25] OPTN, Adult heart status 2 exception criteria justification form. Accessed in UNet℠ October 29, 2019.
[26] OPTN, *One-Year Monitoring of the Heart Allocation Proposal*, Table 16, p. 66.
[27] OPTN, Thoracic Organ Transplantation Committee, meeting summary, February 27, 2020.

Purpose of the Proposal

The Committee has carefully monitored the impacts resulting from the allocation policy changes implemented in 2018. Based on those changes, the Committee identified opportunities to better operationalize existing policy through clarifications and amendments, including changes that could better align policies based on the intended medical urgencies.

In addition to the policy clarifications, , the Committee concluded that addressing the use of exceptions associated with Status 2 candidates being treated with Intra-Aortic Balloon Pumps or Percutaneous Endovascular Mechanical Circulatory Support Devices would likely have a substantial impact towards aligning the behavior of the transplant programs and regional review boards more closely with the adult heart policy. The proposed guidance document is designed to provide transplant program staff who prepare exception requests and regional review board members who review the requests with more effective practices regarding the types of information and level of detail that should be included in any request. The Committee's intent is to establish a standard or baseline of information that would be reasonably expected to describe a candidate's clinical status. Such a standard, consistently applied, should minimize the differences currently found across the requests and improve the ability of the regional review boards to consistently apply policy across the requests.

Proposal

In an effort to ensure that adult heart allocation policy treats candidates with similar medical urgency equally, the Committee proposes the following changes:

Timing of Obtaining Hemodynamic Data Associated With *Policy 6.1.D.ii: Inotropes Without Hemodynamic Monitoring*

Policy 6.1.D.ii: Inotropes without Hemodynamic Monitoring requires that a candidate have a cardiac index of less than 2.2 L/min/m^2 *within 7 days prior to submission of the Heart Status 4 Justification Form* [emphasis added].[28] The heart transplant community has questioned associating the timing of obtaining the cardiac index to submission of the form. The Committee agreed that a policy change was appropriate to clarify that a stable candidate did not need to undergo additional hemodynamic testing to obtain the value.

This proposal removes the policy language associated with submission of the Adult Heart Status 4 Justification Form as the baseline for measuring when a candidate's cardiac index met the requirement. In its place, the following language is proposed "Cardiac index of less than 2.2 L/min/m^2 within 7 days prior *to inotropic administration or while on inotrope infusion as specified* [emphasis added]" by subsequent criteria in the policy. The Committee members agreed that their intent in proposing the change is to indicate to the transplant programs that a candidate should not be weaned from inotropes in order to perform a right heart catheterization to prove that the candidate had a cardiac index indicating cardiogenic shock.[29]

[28] OPTN, *Policy 6.1.D.ii: Inotropes without Hemodynamic Monitoring*.
[29] Meeting Summary for April 17, 2020 meeting, OPTN, Thoracic Organ Transplantation Committee, https://optn.transplant.hrsa.gov/media/3783/20200417_thoracic_meeting-summary.pdf (accessed June 6, 2020)

Additionally, this proposal extends the length of both the initial qualifying period and the extension from 90 to 180 days. Extending the timeframe results in less invasive testing of a stable candidate who may be waiting for a transplant for some time.

If approved, the policy changes will result in the collection of additional data fields. The data fields will indicate the date associated with the inotrope administration. The dates will be used to validate that the cardiac index value was measured within seven days of inotrope initiation, as opposed to within seven days prior to form submission as currently established in policy. The Data Advisory Committee (hereafter, DAC) reviewed the data fields in their role as an operating committee with responsibility for all data collection activity. The DAC members did not have any concerns about the proposed data fields.

Aligning Extension Timeframe for *Policy 6.1.A.ii: Non-dischargeable, Surgically Implanted, Non-Endovascular Biventricular Support Device* with Other Status 1 Conditions

A candidate listed at Status 1 under *Policy 6.1.A.ii: Non-dischargeable, Surgically Implanted, Non-Endovascular Biventricular Support Device* is eligible to stay at the status for up to 14 days under the initial application. The candidate's stay can be extended every 14 days by submission of another extension form. Candidates are not required to meet any additional criteria in order to extend under this criteria. This proposal will limit the initial qualifying period and the extension period to up to seven days for a candidate assigned to Status 1 by a non-dischargeable, surgically implanted, non-endovascular biventricular support device. Limiting the initial and extension timeframes more closely aligns this criterion with the timeframes established in *Policy 6.1.A.i: Veno-Arterial Extracorporeal Membrane Oxygenation (VA ECMO)*.

The Committee sought to make the initial qualifying timeframes and extension timeframes consistent within the Status 1 criteria. Median days to transplant for Status 1 candidates was four days during the post-implementation period of October 18, 2018 through October 17, 2019.[30] During that time, 22 candidates were added to the waiting list under Policy 6.1.A.ii, while 102 candidates were added under the VA ECMO criteria.[31]

Reordering Listing of Evidence of Device Infections

In order to better clarify the policy, the Committee is proposing to rearrange the order of the table identifying the evidence of device infection associated with *Policy 6.1.C.vi: Mechanical Support Device with Infection*. It was recommended that the criterion of positive culture of material from the pump pocket of an implanted device should follow the criterion referring to debridement of the driveline. Then the two bacteremia-specific infections would be grouped together.

Guidance Document

A goal of the 2018 Modifications to the Adult Heart Allocation System policy changes was to reduce the number of exceptions by better accommodating the clinical scenarios addressed in policy. Reliance on

[30] OPTN, *One-Year Monitoring of the Heart Allocation Proposal to Modify the Heart Allocation System*, February 20, 2020, Table 9, p. 48.
[31] OPTN, *One-Year Monitoring of the Heart Allocation Proposal to Modify the Heart Allocation System*, Table 2, p. 12.

exception requests is not optimal for the patient. First, similar candidates may be treated differently because the decision to submit an exception request is made by the individual transplant program. Programs may use different criteria when making such decisions. Second, an exception request must be reviewed and approved by a regional review board, resulting in the possibility that the request will be denied. Additionally, the lack of clear and direct guidance regarding the use of exceptions may result in variability from reviewer to reviewer and region-to-region, introducing another level of complexity for the candidate's request.

However, as stated in the Background section, monitoring reports following implementation found that the anticipated reduction in exception request volume had not occurred. Moreover, the majority of the exception requests submitted under the new policy are being approved by the regional review boards. Reasons why the number of exception requests have not decreased may include:

- The community is still familiarizing itself with the new policy
- The community has found a pathway to circumvent the standard criteria
- The community has found some of the criteria more stringent
- The new policy still does not adequately accommodate most clinical scenarios
- The regional review board members are unsure of how to interpret the new policy and so are reluctant to deny exception requests
- The community is using temporary support devices in ways that were not considered when the new policy was developed

The Committee drafted the guidance document with the goal of assisting heart transplant programs to complete exception requests more uniformly for status 2 candidates who are supported by Percutaneous Endovascular MCSD and IABP. The guidance is also intended to help the RRBs evaluate exception requests by identifying certain standard information that should be included with each request.

The following scenario to demonstrate what they believe would constitute an appropriate level of detail in a clinical narrative as part of an initial exception request. The example is meant for illustrative purposes only, and does not reflect an actual patient.

> *Our patient is a 62 year-old male with ischemic cardiomyopathy, ejection fraction (EF) 10%, who was placed on an IABP on May 15 for refractory cardiogenic shock demonstrated by cardiac index (CI) 1.8, pulmonary capillary wedge pressure (PCWP) 18, and systolic blood pressure (SBP) 95 and intermittent angina on milrinone 0.5 mcg/kg/min. After implantation his PCW dropped to 12, SBP rose to 110 and CI rose to 2.2 and has had no further angina. He was listed Status 2 on May 16. His current hemodynamics are right atrium (RA) 5-8, pulmonary artery (PA) 40s/20s, PCWP 12-15, and CI 2.1-2.4. We are requesting this exception to the SBP under 90 because attempts to increase inotropes worsened angina and more aggressive diuresis or GATA4, Mef2c, and Tbx5 (GMT) resulted in worsened renal function.*

The following is what an appropriate and descriptive clinical narrative might appear like if the fictional candidate's program was to submit an extension request:

> *In the last 48 hours, we did not attempt to wean from the IABP as the patient remains in persistent cardiogenic shock as evidenced by worsening CI to 1.8 on full IABP support as well as decline in mixed venous oxygen saturation SVO2 to take 48%. At this time, we are worried that patient is not a candidate for durable LVAD due to inability to take warfarin due to the current gastrointestinal (GI) bleeds.*

The Committee expects the guidance will assist transplant programs to demonstrate that a candidate has both the medical urgency and potential for benefit comparable to that of other candidates at this status.[32] The guidance document describes the expected level of detail.

NOTA and Final Rule Analysis

The Committee developed the policy proposal under the authority of the OPTN Final Rule, which states "The OPTN Board of Directors shall be responsible for developing…policies for the equitable allocation for cadaveric organs."[33] The OPTN is providing the public with the opportunity to comment on these proposed policy changes in accordance with NOTA[34] and the Final Rule.[35]

In addition, because it will require the submission of official OPTN data that are not presently collected by the OPTN, the Committee submits the following proposal for Board consideration under the authority of the OPTN Final Rule, which states, "An organ procurement organization or transplant hospital shall…submit to the OPTN…information regarding transplant candidates, transplant recipients, [and] donors of organs…."[36] The OPTN shall "maintain records of all transplant candidates, all organ donors and all transplant recipients."[37]

The Final Rule requires that when developing policies for the equitable allocation of cadaveric organs, such policies must be developed "in accordance with §121.8," which requires that allocation policies "(1) Shall be based on sound medical judgment; (2) Shall seek to achieve the best use of donated organs; (3) Shall preserve the ability of a transplant program to decline an offer of an organ or not to use the organ for the potential recipient in accordance with §121.7(b)(4)(d) and (e); (4) Shall be specific for each organ type or combination of organ types to be transplanted into a transplant candidate; (5) Shall be designed to avoid wasting organs, to avoid futile transplants, to promote patient access to transplantation, and to promote the efficient management of organ placement;…(8) Shall not be based on the candidate's place of residence or place of listing, except to the extent required by paragraphs (a)(1)-(5) of this section." This proposal:

- **Is based on sound medical judgment[38]** because the policy modifications were made to better align candidates' medical urgencies with policy and clarify that programs are not required to stop inotropic treatment to obtain a cardiac index value.
- **Seeks to achieve the best use of donated organs[39] by** ensuring organs are allocated and transplanted according to medical urgency. Because the underlying goal of the changes to adult heart allocation policy was to ensure that the most medically urgent candidates are prioritized, these policy changes further that goal by refining the requirements for candidates to qualify for the higher urgency statuses.

[32] OPTN, Adult heart status 2 exception criteria justification form. Accessed in UNet℠ October 29, 2019.
[33] 42 C.F.R. §121.4(a)(1).
[34] 42 U.S.C. §274(a)(2)(B).
[35] 42 C.F.R. §121.4 (a), (b)(1), and (e)(2).
[36] 42 C.F.R. §121.11(b)(2).
[37] 42 C.F.R. §121.11(a)(1)(ii).
[38] 42 C.F.R. §121.8(a)(1).
[39] 42 C.F.R. §121.8(a)(2).

- **Is designed to…promote patient access to transplantation[40] by** giving similarly situated candidates equitable opportunities to receive an organ offer. This proposal refines status criteria to ensure that candidates that are medically similar to each other have an equitable opportunity for transplant based on their urgency status.

This proposal also preserves the ability of a transplant program to decline an offer or not use the organ for a potential recipient,[41] and it is specific to an organ type, in this case heart.[42]

The proposal outlined in this briefing paper addresses certain aspects of the Final Rule listed above, and the Committee does not expect impacts on the following aspects of the Final Rule:

- Shall be designed to avoid wasting organs. This proposal is not anticipated to impact the number of organs recovered but not transplanted.
- Shall be designed to avoid futile transplants. This proposal is not anticipated to result in transplantation of recipients that are unlikely to have positive post-transplant outcomes.
- Shall be designed to promote the efficient management of organ placement. This proposal is not anticipated to affect the costs and logistics of procuring and transplanting organs.
- Shall not be based on the candidates place of residence or place of listing, except to the extent required [by the aforementioned criteria]. This proposal is not based on the candidate's place of residence or place of listing.

The OPTN issues the guidance for the operation of the OPTN.[43] This guidance will support the operation of the regional review boards by assisting the reviewers with evaluating exception requests. The OPTN Final Rule requires the Board to establish performance goals for allocation policies, including "reducing inter-transplant program variance."[44] This guidance document will assist in reducing inter-transplant program variance in the performance indicators initially adopted by the Board when it modified the adult heart allocation system. These performance indicators include exception requests stratified by medical urgency status.[45]

Consideration of Potentially Disadvantaged Groups and Transition Procedures

The Final Rule also requires the OPTN to "consider whether to adopt transition procedures" whenever organ allocation policies are revised to ensure that those waiting for transplant are treated "no less favorably than they would have been treated under previous policies".[46] The Committee did not identify any populations that may be treated "less favorably than they would have been treated under the previous policies" if these proposed policies are approved by the Board of Directors. The members considered the potential impact of reducing a candidate's stay from 14 days to seven days under *Policy 6.1.A.ii: Non-dischargeable, Surgically Implanted, Non-Endovascular Biventricular Support Device*. The Committee agreed that the shorter timeframe was appropriate based on the medical urgency associated

[40] Ibid.
[41] 42 C.F.R. §121.8(a)(3).
[42] 42 C.F.R. §121.8(a)(4).
[43] 2019 OPTN Contract Task 3.2.4: Development, revision, maintenance, of OPTN Bylaws, policies, standards and guidelines for the operation of the OPTN.
[44] 42 C.F.R. §121.8(b)(4)
[45] OPTN Briefing Paper: Proposal to Modify the Adult Heart Allocation System. December 2016. https://optn.transplant.hrsa.gov/media/2006/thoracic_brief_201612.pdf (accessed on June 24, 2020).
[46] 42 C.F.R. § 121.8(d).

with Status 1 candidates, as well as the information that the median wait to transplantation was four days for Status 1 candidates.

Implementation Considerations

Member and OPTN Operations

Operations affecting Transplant Hospitals

Transplants programs will need to educate their personnel on the details associated with the policy modifications and the availability of the guidance document. Transplant programs may need to update their training protocols related to the completion of adult heart status justification forms related to initial, extension, and exception applications. Program staff may want to provide more substantive information detailing the reasons a candidate meets the clinical criteria associated with the adult status criteria than has previously been provided. The update may require closer interaction with the physicians and other clinical care providers. Programs with adult status 1 patients who meet the criteria for non-dischargeable, surgically implanted, non-endovascular biventricular support device will need to more frequently update their adult heart status 1 justification forms in order to extend their candidates at the status.

Transplant programs assisting adult heart Status 4 candidates who are meeting the criteria for inotropes without hemodynamic monitoring will need to provide the date the candidate's inotrope administration started in order to validate that the cardiac index value was collected within seven days of the start of inotrope administration. A transplant program will provide the date when inotrope administration was started on the Adult Heart Status 4 Justification Form.

Operations affecting Histocompatibility Laboratories

This proposal is not expected to affect the operations of Histocompatibility Laboratories.

Operations affecting Organ Procurement Organizations

This proposal is not expected to affect the operations of Organ Procurement Organizations.

Operations affecting the OPTN

Programming changes are required as part of the proposal. First, four new data fields will be collected indicating the date of inotrope initiation. A transplant program will be required to report the date associated with the initiation of the following intravenous inotropes:

- Dobutamine
- Dopamine
- Epinephrine
- Milrinone

The date information will be used to validate that the cardiac index was measured within seven days of inotrope administration.

Currently, similar dates are already captured on the justification forms associated with *Policy 6.1.C.v: Mechanical Circulatory Support Device with Right Heart Failure*. Transplant programs are already

required to enter the dosage associated with the therapy being used. Under the policy change, programs would also have to enter the date the inotrope therapy was initiated. Transplant program staff can enter the date in a MM/DD/YYYY format. In an effort to promote data consistency, transplant programs also have the ability to use a calendar link programmed into the forms to select the date. This approach should limit formatting issues associated with the dates.

In addition, changes are need to the heart justification forms and to the timing associated with the extension forms. The changes will also necessitate special circumstances for managing the justification forms that were in place prior to the implementation of these policy changes. This is estimated as a large IT effort based largely on handling the 'in-flight' forms and required database modifications.

Projected Fiscal Impact

This proposal will require the submission of official OPTN data that are not presently collected by the OPTN. As part of the proposed changes to Policy 6.1.D.ii: Inotropes without Hemodynamic Monitoring transplant programs must provide the date of inotrope initiation for up to four inotropes. The dates will be used as a factor in determining whether the candidate is eligible for listing at Status 4 under this criterion. Currently, the OPTN does collect the initiation dates for this criterion, although it collects this information as part of Policy 6.1.C.v: Mechanical Circulatory Support Device with Right Heart Failure. The collection of new OPTN data is subject to the Paperwork Reduction Act of 1995, which requires approval from the federal Office of Management and Budget (OMB). The OMB approval process may impact the implementation timeline.

Minimal or no expected fiscal impact for OPOs, transplant hospitals, or histocompatibility labs.

Post-implementation Monitoring

Member Compliance

The Final Rule requires that allocation policies "include appropriate procedures to promote and review compliance including, to the extent appropriate, prospective and retrospective reviews of each transplant program's application of the policies to patients listed or proposed to be listed at the program."[47]

The proposed language will not change the current routine monitoring of OPTN members. Site surveyors will continue to review a sample of medical records, and any material incorporated into the medical record by reference, to verify that the data reported in UNet℠ to justify a candidate's status are consistent with documentation in the candidate's medical record.

Policy Evaluation

The Final Rule requires that allocation policies "be reviewed periodically and revised as appropriate."[48] On October 18, 2018, the OPTN implemented substantial changes to the adult heart allocation system. The new policy clarifications will be monitored in conjunction with and on the same timeline as the October, 2018 system changes. Specific additions to the monitoring plan will include the changes in the

[47] 42 C.F.R. §121.8(a)(7)
[48] 42 C.F.R. §121.8(a)(6)

number of Status 1 Non-dischargeable, Surgically Implanted, Non-Endovascular Biventricular Support Device (Policy 6.1.A.ii) and the number of Status 4 Inotropes without Hemodynamic Monitoring (Policy 6.1.D.ii) initial and extension requests. As sample size permits, the waiting list mortality rate for these criteria for Status 1 and Status 4 candidates may be reported and compared based on pre- and post-policy clarification date. To monitor the guidance document, the number of transplants by adult heart status and exception status will be compared based on pre- and post- implementation of the guidance. As sample size permits, the waiting list mortality rate for Status 2 candidates will be compared pre- and post-implementation of the guidance. The OPTN and SRTR contractors will work with the Committee to define any additional analyses requested for monitoring.

Conclusion

This proposal is part of an effort by the Heart Transplantation Committee to address issues identified when the adult heart allocation system changes were implemented in October 2018. The changes proposed for *Policy 6.1.D.ii: Inotropes without Hemodynamic Monitoring* intend to ensure that the condition of a stable patient is not put in jeopardy to obtain a cardiac index measurement, and that the initial and extension qualifying periods are appropriate. The Committee members also agreed that the initial and qualifying periods for *Policy 6.1.A.ii: Non-dischargeable, Surgically Implanted, Non-Endovascular Biventricular Support Device* should be shortened to reflect the high medical urgency of such candidates and the median length of time they remain in the status before being transplanted. Finally, the Committee sought to clarify OPTN policy by reordering the symptoms identified in MCSD and device infections.

Adult heart transplant programs should consider this guidance when submitting exception requests on behalf of Status 2 candidates supported by a Percutaneous Endovascular MCSD or by an IABP. RRB members are encouraged to consult this resource when assessing exception requests on behalf of Status 2 candidates supported by a under Percutaneous Endovascular MCSD or by an IABP.

Policy Language

Proposed new language is underlined (example) and language that is proposed for removal is struck through (~~example~~). Heading numbers, table and figure captions, and cross-references affected by the numbering of these policies will be updated as necessary.

6.1 Adult Status Assignments and Update Requirements

6.1.A Adult Heart Status 1 Requirements

6.1.A.ii Non-dischargeable, Surgically Implanted, Non-Endovascular Biventricular Support Device

A candidate's transplant program may assign a candidate to adult status 1 if the candidate is admitted to the transplant hospital that registered the candidate on the waiting list, is supported by a surgically implanted, non-endovascular biventricular support device and must remain hospitalized because the device is not FDA-approved for out of hospital use.

This status is valid for up to ~~14~~7 days from submission of *the Heart Status 1 Justification Form*. This status can be extended by the transplant program every ~~14~~7 days by submission of another *Heart Status 1 Justification Form.*

6.1.C Adult Heart Status 3 Requirements

6.1.C.vi Mechanical Circulatory Support Device (MCSD) with Device Infection

A candidate's transplant program may assign a candidate to adult status 3 if the candidate is supported by an MCSD and is experiencing a pump-related local or systemic infection, with *at least one* of the symptoms according to *Table 6-1: Evidence of Device Infection* below.

Table 6-1: Evidence of Device Infection

If the candidate has evidence of:	Then this status is valid for up to:
Erythema and pain along the driveline, with either leukocytosis or a 50 percent increase in white blood cell count from the last recorded white blood cell count, and *either*: • Positive bacterial or fungal cultures from the driveline exit site within the last 14 days • A culture-positive fluid collection between the driveline exit site and the device	14 days from submission of *the Heart Status 3 Justification Form*.
Debridement of the driveline with positive cultures from sites between the driveline exit site and the device	14 days from submission of *the Heart Status 3 Justification Form*.
Positive culture of material from the pump pocket of an implanted device	90 days from submission of *the Heart Status 3 Justification Form*.
Bacteremia treated with antibiotics	42 days from submission of *the Heart Status 3 Justification Form*.
Recurrent bacteremia that recurs from the same organism within four weeks of completing antibiotic treatment to which the bacteria is susceptible	90 days from submission of *the Heart Status 3 Justification Form*.
~~Positive culture of material from the pump pocket of an implanted device~~	~~90 days from submission of *the Heart Status 3 Justification Form*.~~

After the initial qualifying time period, this status can be extended by the transplant program by submission of another *Heart Status 3 Justification Form*.

6.1.D Adult Heart Status 4 Requirements

6.1.D.ii Inotropes without Hemodynamic Monitoring

A candidate's transplant program may assign a candidate to adult status 4 if the candidate is supported by a continuous infusion of a positive inotropic agent, and meets *all* of the following:

1. Cardiac index of less than 2.2 L/min/m^2 within 7 days prior to ~~submission of the *Heart Status 4 Status Justification Form*~~ inotropic administration or while on inotrope infusion as specified below
2. Pulmonary Capillary Wedge Pressure greater than 15 mmHg
3. Requires at least *one* of the following intravenous inotropes:
    - Dobutamine greater than or equal to 3 mcg/kg/min
    - Milrinone greater than or equal to 0.25 mcg/kg/min
    - Epinephrine greater than or equal to 0.01 mcg/kg/min
    - Dopamine greater than or equal to 3 mcg/kg/min

This status is valid for up to ~~90~~180 days from submission of *the Heart Status 4 Justification Form*. After the initial ~~90~~180 days, this status can be extended by the transplant program every ~~90~~180 days by submission of another *Heart Status 4 Justification Form*.

#

Guidance for Adult Heart Exceptions for Status 2 Candidates Experiencing Cardiogenic Shock

Recommendations

The following information provides useful guidance for transplant program staff responsible for completing the clinical narrative portion of an initial exception request or an extension exception request on behalf of a candidate to be assigned at status 2. Transplant programs are expected to demonstrate that a candidate has both the medical urgency and potential for benefit comparable to that of other candidates at this status.[49] The information may also be useful guidance for Heart Regional Review Board (RRB) members who are asked to approve upgraded listing urgency by exception for adult heart candidates.

The guidance is designed to serve as a template for transplant program staff who are responsible for completing the clinical narrative portion of exception requests. The Committee realizes the guidance will not address all cases, but believes it will be a useful and practical tool. In addition, the guidance is intended to provide RRB members with a roadmap to certain, useful information necessary for making informed decisions.

The guidance is organized in three sections: a clinical description of the patient, factors impacting the program's attempt to wean the candidate, and applicable contraindications to a VAD. The Thoracic Committee identified these as important components for any description of why the temporary therapies of Percutaneous Endovascular MCSD or IABP was used to treat a candidate's cardiogenic shock. It is the Committee's intention that the list of clinical criteria in this section should serve as evidence that the candidate remains with persistent hemodynamic instability. When completing the clinical narrative of an exception request, transplant program staff should be submitting clinical measurements and not just indicating the presence or absence of a condition.

TEMPLATE

Section 1: Characterization of the Patient

Candidate (Waiting list ID#) is a (age) year old (male/female) with (Dilated/Ischemic/Restrictive) Cardiomyopathy who is status post (S/P) Percutaneous Endovascular MCSD or IABP on (implant date) in this transplant program's Intensive Care Unit on Inotropes (provide agents and dose) and Pressors (provide agents and dose). Patient has been listed as a Status (1/2/3/4/5/6) since _____

Current hemodynamics are as follows (If a Swan-Ganz catheter is available,):

Right Atrium (RA):	
Pulmonary Artery (PA):	
Pulmonary Capillary Wedge Pressure (PCWP):	
Cardiac Index (CI):	

[49] OPTN, Adult heart status 2 exception criteria justification form. Accessed in UNet℠ October 29, 2019.

We are requesting this exception for _ (specify data item)_____
because _____

Section 2: Inability to Wean Candidate

In the last 48 hours, we did not attempt weaning from Percutaneous Endovascular MCSD or IABP as the candidate remains in persistent cardiogenic shock as evidenced by: (provide the values for one or more items)

Hypotension Mean Arterial Pressure (MAP):	
Reduced Cardiac Index (CI):	
Elevated PCW:	
Low $SvO_{2\ or}$ PA sat	
Worsening End Organ Function:	
Requiring increasing doses of inotropic agents or pressors:	
Ventricular Tachycardia (VT):	
Other:	

Section 3: Contraindications to LVAD

The following should be considered as general information that might be expected when describing why a patient is not a candidate for durable LVAD Support (extension only).

1. Severe Right Heart Failure (RHF)
    a. Echo: Severe TR; TASPE < 7.5mm; RVEF < 20%; RV/LV size > 0.75
    b. Hemodynamic: RA:PCW > 0.54; RVSWI < 250; PAPi < 1
2. Surgical Contraindications
    a. Mechanical Aortic Valves (AV)
    b. Mechanical Mitral Valves (MV)
    c. Small Left Ventricle (LV) Cavity
    d. Left Ventricular Thrombus
    e. VSD
    f. Body size BSA < 1.1
    g. Other: (Describe)
3. Need for Multi-organ Transplant
    a. Renal
    b. Liver
4. Blood Dyscrasias
    a. Thrombocytopenic
    b. Hypercoagulable
    c. Contraindication to Warfarin
5. Active Co-morbidity
    a. Infection
        i. Date: _(mm/dd/yyyy)
        ii. Site:_____
        iii. Culture:_____
    b. Recent CVA
        i. Date: _(mm/dd/yyyy)

   c. Bleeding
      i. Date: _(mm/dd/yyyy)
      ii. Site:_____
6. Re-current Refractory Ventricular Arrhythmias
7. Other:_____

Note: It is recommended that requesting programs not rely solely on patient preference when submitting an extension exception request to maintain a candidate at Status 2.

Conclusion

Adult heart transplant programs should consider this guidance when submitting exception requests on behalf of Status 2 candidates supported by a Percutaneous Endovascular MCSD or by an IABP. RRB members are encouraged to consult this resource when assessing exception requests on behalf of Status 2 candidates supported by a under Percutaneous Endovascular MCSD or by an IABP.

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OPTN

Guidance Document for Public Comment

Guidance Addressing the Use of Pediatric Heart Exceptions

OPTN Heart Transplantation Committee

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Contents

Guidance Addressing the Use of Pediatric Heart Exceptions

Sponsoring Committee: *Heart Transplantation*
Public Comment Period: *August 4, 2020 – October 1, 2020*

Executive Summary

In June 2020, the Organ Procurement and Transplantation Network (OPTN) Board of Directors (the Board) approved creation of a National Heart Review Board (NHRB) for Pediatrics.[1] Members of the former OPTN Thoracic Organ Transplantation Committee and the Pediatric Transplantation Committee developed the NHRB for Pediatrics proposal during 2019 and 2020. The members had formed a Pediatric Heart Workgroup (hereafter, the Workgroup) to address concerns about the use of pediatric heart exception requests following allocation policy changes implemented in March 2016[2]. Workgroup members were also concerned about the lack of pediatric heart expertise on the regional review boards as well as the regional differences associated with the approval of pediatric heart exception requests. Following the dissolution of the OPTN Thoracic Organ Transplantation Committee[3], the newly formed OPTN Heart Transplantation (hereafter, the Committee) will sponsor the NHRB.

The Workgroup vested authority for determining pediatric exception requests within a single entity comprised of individuals with specific pediatric heart transplantation expertise. Following implementation of the NHRB, each pediatric Status 1A and 1B exception request will be randomly assigned to a group of specialists in pediatric heart transplant from across the country. NHRB members assigned to a request will decide whether to approve it based on the information provided by the requesting transplant program.

While working on the NHRB for Pediatrics proposal, the Workgroup agreed to also develop a guidance document for assisting future NHRB members with their exception request determination. To improve what clinical information is submitted for members to review, the document also provides guidance for the transplant programs responsible for drafting the requests. The Workgroup determined a guidance document was more appropriate than policy changes since exceptions arise because the candidate's condition cannot be easily aligned with the criteria established in policy. A guidance document allows reviewers to consider the specific clinical circumstances of each candidate on a case by case basis to determine whether the exception criteria set forth by OPTN Policy are met. Similar guidance documents that further define clinical criteria to assist with the review of exception requests are implemented for other organ review boards such as the National Liver Review Board.

The Committee is seeking public feedback on the proposed guidance, including the following:

- Are there other contraindications to the use of a Ventricular Assist Device (VAD) that should be considered?

[1] OPTN Board of Directors meeting, June 8. 2020.
[2] This proposal is available at https://optn.transplant.hrsa.gov/professional-education/pediatric-heart-allocation/
[3] Effective 7/1/2020, the OPTN Thoracic Committee dissolved and was replaced with the OPTN Lung Transplantation Committee and the OPTN Heart Transplantation Committee which will continue to sponsor the NHRB for Pediatrics project. https://optn.transplant.hrsa.gov/media/3721/thoracic-split-policy-notice-march-2020.pdf

- What, if any, measure of sensitization could be included to assist in determining whether a Coronary Allograft Vasculopathy candidate should be considered for Status 1A listing by exception?

Background

The National Organ Transplantation Act of 1984 (NOTA), as amended, provides special status to pediatric transplant candidates. Under NOTA, the OPTN is required to "adopt criteria, policies, and procedures that address the unique health care needs of children" under the age of 18.[4] As part of its ongoing commitment to this population, the Board approved changes to pediatric heart allocation policy that were implemented in 2016. The Board's primary goal was improving waiting list mortality rates for pediatric candidates. The Board sought to achieve this, in part, by redefining the criteria associated with pediatric heart Statuses 1A and 1B to ensure that candidates of comparable levels of medical urgency are in the same statuses.

However, initial findings suggested little change in waiting list mortality rates. In October 2017, members of both the Thoracic and Pediatric committees reviewed a monitoring report analyzing the first 12 months after implementation of the new policy.[5] According to a subsequent report, analysis of the first 12 months of data following implementation found that pediatric death rates on the heart waiting list did not change after policy implementation.[6] At the time, Committee members noted a marked increase in the use of exceptions to justify placing candidates in Status 1A, particularly among those diagnosed with cardiomyopathy.[7] A result of the policy modifications was that candidates diagnosed with cardiomyopathy were less likely to be placed in Status 1A based on the new criteria. Evaluation of the monitoring data also revealed that the candidates being listed at Status 1A by exception following implementation saw an increase in their access to transplantation, which was not found among other diagnoses.[8]

The Workgroup members considered these findings and other information during their 2019 and 2020 work on the NHRB for Pediatrics. Based on the information, the Workgroup also identified the need to clarify the use of exception requests for pediatric heart Status 1A candidates. They also decided that a guidance document, similar to guidance created for the National Liver Review Board, was a more appropriate tool than a policy change because exceptions fall outside of established policy by their nature, and involve the discretion of those submitting and reviewing them. A guidance document also allows them to clarify the intent of existing policy, without rising to the level of an OPTN Obligation.

It was determined to include the following categories for the reasons below in the guidance document.

- Dilated Cardiomyopathy
    - A higher proportion of transplant recipients diagnosed with cardiomyopathy were in Status 1A by exception after implementation of the new policy (see **Figure 1**)
    - Waiting list mortality for candidates with cardiomyopathy in Status 1A was not statistically different from that of candidates in Status 1B before and after policy implementation[9]
    - Candidates waiting in Status 1A had significantly higher transplant rates than those in Status 1B[10]

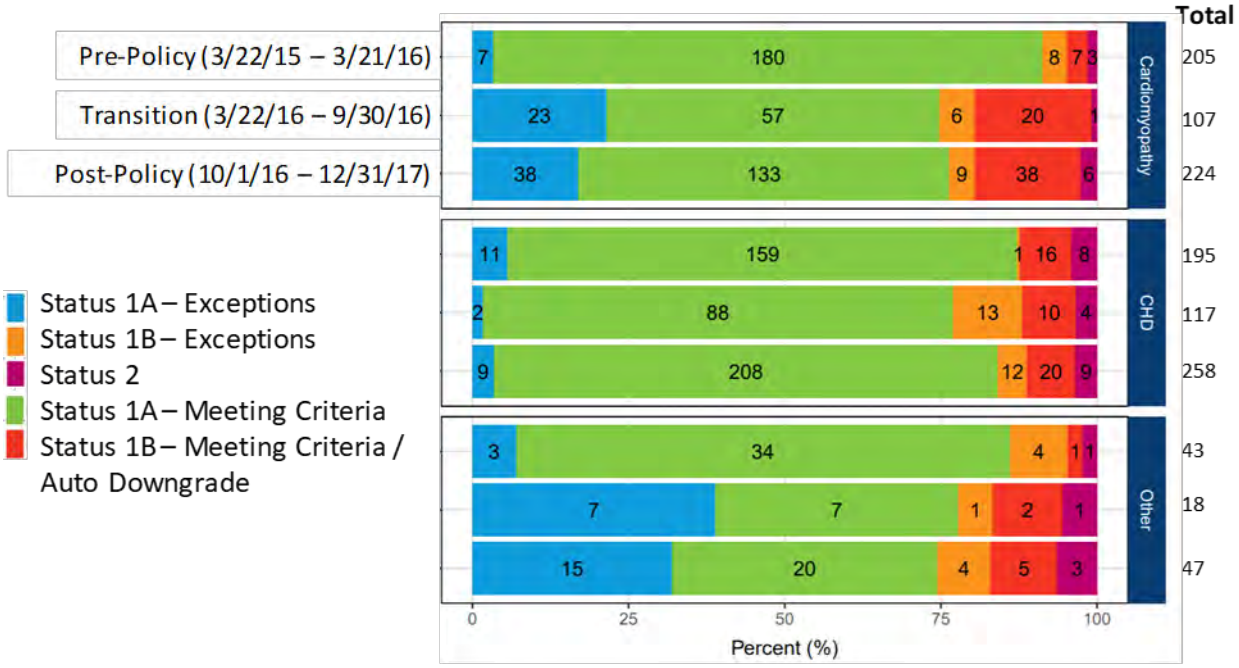
[4] 42 USC §274(b)(2)(M), (O).
[5] OPTN, *Final Report: Changes to Pediatric Heart Allocation Policy Evaluation*, October 12, 2017.
[6] OPTN, *Final Report: Changes to Pediatric Heart Allocation Policy Evaluation*, April 9, 2018.
[7] IBID.
[8] IBID.
[9] IBID.
[10] IBID.

- Hypertrophic or restrictive cardiomyopathy
    - Candidates had higher waiting list mortality when qualifying under standard criteria and not an exception
    - Inotrope use as a qualifying criteria for Status 1A was eliminated in 2016 policy changes potentially increasing exceptions for candidates who likely would have qualified under this criteria previously

- Coronary allograft vasculopathy (CAV) and retransplants
    - Candidates do not have any particular prioritization under the current allocation system
    - 63% of retransplants are due to CAV[11]
    - 6.6% higher waiting list mortality than primary heart transplant candidates[12]

- Single ventricle congenital heart disease
    - Inconsistency with adult status for certain single ventricle candidates resulting in the potential for the same patient to be in a lower listing status as a pediatric candidate than if they were listed as an adult

Figure 1: Pediatric Heart Transplants by Exception Status, Era and Diagnosis[13]



[11] Bock, Matthew J., Khanh Nguyen, Stefano Malerba, Kimberly Harrison, Emilia Bagiella, Bruce D. Gelb, Sean P. Pinney, and Irene D. Lytrivi. "Pediatric cardiac retransplantation: Waitlist mortality stratified by age and era." The Journal of Heart and Lung Transplantation 34, no. 4 (2015): 530-537.

[12] IBID.

[13] OPTN, *Briefing Paper, National Heart Review Board for Pediatrics*, June 2020, p. 4. Accessed 07/08/2020. https://optn.transplant.hrsa.gov/media/3808/202006_thoracic_natl_heart_reviewboard_for_peds_bp.pdf

Purpose

The purpose of this proposal is to create a guidance document for the NHRB for Pediatric Candidates. The guidance document was drafted with the goal of increasing equal access to candidates with comparable medical urgency by helping the members of the NHRB for Pediatrics standardize decision-making when reviewing exception requests for certain Status 1A and Status 1B candidates. This guidance document does not create or change OPTN policy

The document provides guidance on the following pediatric heart diagnoses:

- Dilated cardiomyopathy
- Hypertrophic or restrictive cardiomyopathy
- Single ventricle heart disease
- Coronary allograft vasculopathy and transplantation

Recommendations

The following sections provide information about how the proposed guidance was developed, and includes justifications for the guidance itself.

Dilated Cardiomyopathy (DCM)

DCM candidates generally have had lower waiting list mortality after the 2016 changes, regardless whether they had a Status 1A exception or not.[14] DCM candidates had a higher frequency of using exceptions than HCM/RCM candidates.[15] Accordingly, the intent by including this population in the guidance is to limit the use of exceptions among DCM candidates to those who are at particularly high risk based on clinical conditions in order to maximize the number of candidates who get a transplant within an appropriate amount of time.[16] This includes candidates under five kilograms (kg) in weight who carry a higher risk for use of mechanical support, as well as candidates that weigh between five and ten kilograms and likely carry a similar risk.[17]

Candidates under 5 kg and under 10 kg

The intent of the criteria is to avoid situations in which a candidate is given a ventricular assist device (VAD) just to achieve a higher status for transplant. The proposed guidance states that candidates under 5 kg should be considered for a Status 1A exception if they are on at least one high-dose inotrope. Candidates under 10 kg may be eligible for a Status 1A exception if they are supported by inotropes and demonstrate some evidence of poor systemic perfusion that distinguish a candidate's relative health. Evidence might include feeding intolerance or the need for noninvasive respiratory support like hyponasal cannula, Continuous Positive Airway Pressure (CPAP) device, a Bilevel Positive Airway Pressure (BiPAP) device.

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[14] Magnetta, DA, Godown, J, West, S, et al. Impact of the 2016 revision of US Pediatric Heart Allocation Policy on waitlist characteristics and outcomes. *Am J Transplant*. 2019;19:3276–3283. p. 3281. https://doi-org.proxy.library.vcu.edu/10.1111/ajt.15567

[15] Robinson, Mahle, Davies, "Increasing Use of Exceptions After Changes to Pediatric Heart Allocation," presentation to the American Transplant Conference, June 4, 2018, slide 26.

[16] OPTN, Thoracic Organ Transplantation Committee, meeting summary, January 28, 2020.

[17] Conway J, St Louis J, Morales DL, Law S, Tjossem C, Humpl T. Delineating survival outcomes in children <10 kg bridged to transplant or recovery with the Berlin Heart EXCOR Ventricular Assist Device. *JACC Heart Fail*. 2015;3(1):70-77. doi:10.1016/j.jchf.2014.07.011

Candidates with progressive pulmonary hypertension often need non-invasive positive pressure ventilation, not because of poor systemic perfusion but because the candidates have significant collapse due to cardiomegaly. Pulmonary vascular resistance (PVR) is often mentioned in exception requests but was excluded from the criteria for being too vague of an indicator. Excluding PVR and other vague criteria supports the guidance's objective to limit exceptions in order to grant them to the candidates who are declining rapidly and who would ideally get a transplant instead of a VAD.

Candidates 10 kg and More

For this population, the primary reason to provide a 1A exception is the presence of contraindications to mechanical circulatory support. The proposed guidance document lists criteria that would demonstrate to a review board that a candidate has either contraindications to a VAD or indications that inserting a VAD would be very high-risk.

In cases where a candidate is listed at a transplant program where staff may be uncomfortable inserting VADS, the guidance does not prohibit a transplant program from requesting an exception for a candidate receiving two inotropes, and that such requests could be reviewed on a case-by-case basis. Transplant programs may provide hemodynamic criteria justifying the use of a second inotrope to ensure the second inotrope was not used solely to make a candidate eligible for an exception.

Hypertrophic/Restrictive (HCM/RCM) Cardiomyopathy

This part of the guidance is to serve the population of HCM/RCM candidates whose Status 1A exception requests were denied under the pediatric heart allocation changes implemented in 2016. Specifically, HCM/RCM candidates without a Status 1A exception "had increased cumulative incidence of death on the waitlist following" the 2016 changes in allocation policy.[18] The proposed guidance aims to decrease the high degree of variability in approval for cardiomyopathy under Status 1A exceptions.[19]

This category combines guidance for HCM and RCM candidates and identifies the following criteria as supporting the need for approving a Status 1A exception request: candidate is on inotropes, at risk for premature death, particularly unexpected sudden death, experiencing syncopal episodes, or showing evidence of increased pulmonary vascular resistance. The existing guidance document for adult HCM/RCM cardiomyopathy exception requests was used as a starting template and amended to address the specifics of pediatric heart candidates.[20]

Guidance addressing this candidate population should help the pediatric heart transplant programs as well as the NHRB for Pediatrics members in two ways. First, by clarifying that such candidates likely qualify for an exception to the clinical requirements established in policy. Second, HCM/RCM candidates would benefit by better defining the population of Dilated Cardiomyopathy (DCM) patients who qualify for a Status 1A exception.

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[18] Magnetta, DA, Godown, J, West, S, et al. Impact of the 2016 revision of US Pediatric Heart Allocation Policy on waitlist characteristics and outcomes. *Am J Transplant*. 2019; 19:3276–3283. https://doi-org.proxy.library.vcu.edu/10.1111/ajt.15567

[19] OPTN Thoracic Organ Transplantation Committee, meeting summary, September 24, 2019.

[20] OPTN, *Review Board Guidance for Hypertrophic/Restrictive (HCM/RCM) Cardiomyopathy Exception Requests*, October 2018, https://optn.transplant.hrsa.gov/media/2637/thoracic_guidance_review_board_hcm_rcm_201806.pdf (accessed June 5, 2020).

Multiple criteria is listed in addition to inotrope use so as not encourage clinicians to give inotropes to patients unnecessarily. Formerly, requiring one or more inotrope could qualify a candidate for Status 1A. However, the 2016 changes eliminated inotrope usage as qualifying criteria for this population, potentially increasing waiting list mortality as this access point to a higher status was no longer available.[21]

Pediatric RCM candidates with syncopal events, refractory ventricular arrhythmias/implantable cardioverter defibrillator firing, elevated pulmonary vascular resistance, and/or inotrope treatment should be considered for listing at Status 1A. For HCM candidates, increasing frequency of arrhythmia is an indication that a candidate should be elevated to Status 1A.

Single Ventricle Heart Disease

Single ventricle heart disease in included in the guidance although it is a relatively small population of candidates. As a result, waiting list mortality information for this category of candidates is limited. The decision to include it in guidance was based in part on questions from the pediatric community regarding a perceived incongruity in current policy for single ventricle candidates. A candidate who is listed at 17 years old as a Fontan, without being on inotropes in the hospital, is assigned to pediatric Status 2, but if the candidate is 18 years old at the time of listing, the candidate is assigned to adult Status 4, which is broadly equivalent to pediatric Status 1B.

Most Fontan candidates, who would typically qualify for Status 2, either get approved for pediatric Status 1B by exception, or the candidates receive an exception for pediatric Status 1A after being admitted to the hospital and administered inotropes. In light of this, the guidance is written broadly so that if a candidate is admitted and experiencing complications, like protein-losing enteropathy (PLE) or plastic bronchitis, then pediatric Status 1A is appropriate. However, if the candidate is not admitted but is a Fontan with complications, then pediatric Status 1B is appropriate.

The guidance document for adult congenital heart disease states that single ventricle candidates admitted to the hospital with complications like PLE can be upgraded to Status 3 by exception.[22] Status 3 shares many of the same clinical criteria as pediatric Status 1A including the qualifying condition of being supported by multiple intravenous inotropes or a high dose of a single intravenous inotrope. Based on the comparison of the two statuses, pediatric Status 1A is the appropriate classification for admitted Fontan candidates experiencing complications. Many of these patients would already be in the hospital and qualify for a higher status by meeting other criteria.

While the population of Fontan candidates admitted to the hospital but not on inotropes is small, they are addressed in the proposed guidance based on several considerations. There are particular challenges associated with transplanting sick Fontan patients including a window of frailty in which they quickly become unsuitable candidates from a surgical standpoint. If such candidates are not assigned a higher status before being admitted to the hospital with inotropes, then their post-transplant survival may be low. In addition, donor selection for these candidates is tighter due to previous surgeries and reconstruction, and many of these candidates have antigens. The guidance support these candidates receiving a transplant sooner rather than waiting for them to decline to the point that they need inotropes.

[21] OPTN, Thoracic Organ Transplantation Committee, meeting summary, February 25, 2020.
[22] OPTN, *Review Board Guidance for Adult Congenital Heart Disease (CHD) Exception Requests*, December 2017, https://optn.transplant.hrsa.gov/media/2349/thoracic_guidance_201712.pdf (accessed July 7, 2020).

Coronary Allograft Vasculopathy (CAV) and Retransplant

CAV and retransplant patients do not have any particular prioritization under the current allocation system.[23] These candidates generally are assigned to Status 2. However, transplant programs ask for exceptions when they believe it is merited. Although this population is small and their conditions vary, CAV and retransplant candidates are included in the guidance document because such candidates are a high-risk population who tend to have higher waiting list mortality.

Of retransplant listings between October 1, 1987 and October 14, 2012, 63% were due to CAV[24]. Waiting list mortality for these retransplant candidates was 25.2%, 6.6% higher than candidates receiving their first heart transplant with the average wait time for retransplant being 3 months.[25]

Retransplant patients who are most medically urgent are those who have suffered an arrest event, warranting the approval for listing at Status 1A by exception. Candidates who are experiencing other symptoms suggesting that they are close to cardiac arrest are also included for Status 1A consideration in the guidance. Such symptoms might include non-sustained ventricular arrhythmias or unexplained syncope. Candidates with a history of revascularization for coronary allograft vasculopathy may be eligible for consideration at Status 1B.

NOTA and Final Rule Analysis

The OPTN issues this guidance for the operation of the OPTN[26]. This guidance will support the operation of the NHRB by assisting the reviewers with evaluating exception requests. The OPTN Final Rule requires the Board to establish performance goals for allocation policies, including "reducing inter-transplant program variance."[27] This guidance document will assist in reducing inter-transplant program variance in the performance indicators initially adopted by the Board when it established the NHRB. These performance indicators include: changes in the number and percent of pediatric candidates and transplant recipients by status, exception, age group, OPTN region, and diagnosis; changes in waiting list mortality rate for pediatric candidates by status and exception; changes in transplant rate for pediatric candidates by status and exception; the percent of approvals and denials for exception requests by status; and changes in post-transplant patient survival rates overall and stratified by status.[28]

Implementation

The proposed guidance will require additional communication from the OPTN to both transplant programs and NHRB reviewers.

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[23] OPTN, Thoracic Organ Transplantation Committee, meeting summary, February 25, 2020.
[24] Bock, Matthew J., Khanh Nguyen, Stefano Malerba, Kimberly Harrison, Emilia Bagiella, Bruce D. Gelb, Sean P. Pinney, and Irene D. Lytrivi. "Pediatric cardiac retransplantation: Waitlist mortality stratified by age and era." The Journal of Heart and Lung Transplantation 34, no. 4 (2015): 530-537.
[25] IBID.
[26] 2019 OPTN Contract Task 3.2.4: Development, revision, maintenance, of OPTN Bylaws, policies, standards and guidelines for the operation of the OPTN.
[27] 42 C.F.R. §121.8(b)(4)
[28] OPTN Briefing Paper: National Heart Review Board for Pediatrics. June 8, 2020. https://optn.transplant.hrsa.gov/media/3808/202006_thoracic_natl_heart_reviewboard_for_peds_bp.pdf (accessed on June 24, 2020).

Fiscal Impact

Minimal or no member impact.

OPTN Actions

The OPTN will need to communicate the proposed guidance to all pediatric heart transplant programs and NHRB reviewers. Additional supplemental materials may be created to aid understanding.

Member Actions

Pediatric heart transplant programs will need to ensure that staff responsible for submitting exception requests are familiar with the operational guidelines as well as the proposed guidance document.

Post-implementation Monitoring

The Final Rule requires allocation policies to be "reviewed periodically and revised as appropriate."[29] Although this proposal is not policy, it provides guidance to enhance the implementation of the National Heart Review Board for pediatric candidates. The following evaluation plan will provide the Committee with information on a periodic basis about whether the NHRB for pediatric candidates is achieving its goals, and whether any revisions are warranted.

The NHRB will be formally evaluated approximately 6 months, 1 year, and 2 years post-implementation. The following metrics, and any subsequently requested by the Committee, will be evaluated as data become available (Appropriate lags will be applied, per typical OPTN conventions, to account for time delay in institutions reporting data to UNet℠) and compared to an appropriate pre-policy cohort to assess performance before and after implementation of the NHRB.

- Examine changes in the number and percent of pediatric candidates by status, exception, age group, OPTN region, and diagnosis
- Examine changes in the number and percent of pediatric transplant recipients by status, exception, age group, OPTN region, and diagnosis
- Evaluate changes in waiting list mortality rate for pediatric candidates by status and exception
- Evaluate changes in transplant rate for pediatric candidates by status and exception
- Report the percent of approvals and denials for exception requests by status
- Examine changes in post-transplant patient survival rates overall and stratified by status

Conclusion

This guidance document aims to assist future NHRB members in their decision making when they receive exception requests for pediatric candidates with the diagnoses of dilated cardiomyopathy, hypertrophic or restrictive cardiomyopathy, single ventricle heart disease, and coronary allograft vasculopathy and retransplant. This document also provides guidance to the transplant program submitting the request on these candidates' behalf to improve the efficiency of the review process. The ultimate goal is to ensure that these medically urgent, unique candidates are reviewed consistently by NHRB members and that the information provided by the transplant program provides enough appropriate detail for the NHRB members to make an informed determination.

[29] 42 C.F.R. §121.8(a)(6).

Feedback Questions

The Committee welcomes additional feedback on the proposed guidance, including the following:

1. Are there other contraindications to the use of a Ventricular Assist Device (VAD) that should be considered?
2. What, if any, measure of sensitization could be included to assist in determining whether a Coronary Allograft Vasculopathy candidate should be considered for Status 1A listing by exception?

Guidance for Pediatric Heart Exception Requests

Diagnoses addressed in this Guidance

The guidance document was drafted with the goal of helping the members of the National Heart Review Board for Pediatrics standardize decision-making when reviewing exceptions requests for certain Status 1A and Status 1B candidates. The document provides guidance on the following pediatric heart diagnoses:

- Dilated cardiomyopathy
- Restrictive or hypertrophic cardiomyopathy
- Single ventricle heart disease
- Coronary vasculopathy allograft and retransplant

Standard Information for Inclusion With Pediatric Heart Exception Requests

The following information provides useful guidance for transplant program staff responsible for completing the clinical narrative portion of an initial exception request or an extension exception request on behalf of a pediatric heart candidate. Transplant programs are expected to demonstrate that a candidate has both the medical urgency and potential for benefit comparable to that of other candidates at this status.[30]

Transplant programs are strongly encouraged to submit the following information as part of each exception request:

- Contain specific description of the candidate's current diagnoses and methods of support, inclusive of inotropes and mechanical circulatory support;
- Specifically describe how:
    - The candidate meets the exception criteria, or
    - Why standard therapies may not be ideal for the candidate and why the candidate's condition is not addressed by the pre-specified exception criteria
    - Describe why the current policy does not adequately account for the candidate's particular situation and high risk of waitlist mortality

The Committee realizes the guidance will not address all cases, but believes it will be a useful and practical tool for pediatric heart programs submitting requests. In addition, the guidance is intended to provide National Heart Review Board for Pediatrics members with a roadmap to certain, useful information necessary for making informed decisions.

Category 1: Dilated Cardiomyopathy Patients

Most candidates with dilated cardiomyopathy, in the absence of specific criteria below, are appropriately categorized based on the need for inotropes as Status 1B or for mechanical circulatory support as Status 1A. Table 1 provides useful guidance for the review board asked to approve upgraded listing urgency by exception for children with dilated cardiomyopathy.

[30] OPTN, Adult heart status 2 exception criteria justification form. Accessed in UNet℠ October 29, 2019.

Table 1: Recommended criteria for status exceptions

If the candidate has dilated cardiomyopathy and meets this criteria:	Then the candidate may be eligible for:

Is admitted to the transplant hospital that registered the candidate on the waiting list and meets *all* of the following criteria:
• Weighs less than 5kg
• Supported by *one* of the following:
  ○ A continuous infusion of at least one high-dose intravenous inotrope:
  ▪ Dobutamine greater than or equal to 7.5 mcg/kg/min
  ▪ Milrinone greater than or equal to 0.50 mcg/kg/min
  ▪ Epinephrine greater than or equal to 0.02 mcg/kg/min
  ○ A continuous infusion of at least two intravenous inotropes:
  ▪ Dobutamine greater than or equal to 3 mcg/kg/min
  ▪ Milrinone greater than or equal to 0.25 mcg/kg/min
  ▪ Epinephrine greater than or equal to 0.01 mcg/kg/min
  ▪ Dopamine greater than or equal to 3 mcg/kg/min
	Status 1A exception

Is admitted to the transplant hospital that registered the candidate on the waiting list and meets *all* of the following criteria:
• Weighs less than 10kg
• Supported by *one* of the following:
  ○ A continuous infusion of at least one high-dose intravenous inotrope:
  ▪ Dobutamine greater than or equal to 7.5 mcg/kg/min
  ▪ Milrinone greater than or equal to 0.50 mcg/kg/min
  ▪ Epinephrine greater than or equal to 0.02 mcg/kg/min
  ○ A continuous infusion of at least two intravenous inotropes:
  ▪ Dobutamine greater than or equal to 3 mcg/kg/min
  ▪ Milrinone greater than or equal to 0.01 mcg/kg/min
  ▪ Dopamine greater than or equal to 3 mcg/kg/min
• Has poor systemic perfusion as evidenced by *any* of the following:
  ○ Need for non-invasive positive pressure ventilation
  ○ Feeding intolerance (inability to tolerate full enteral caloric requirement)
  ○ A decline in end-organ function (eg. Acute kidney injury)
	Status 1A exception

Among older and larger patients, the primary reason to provide a 1A exception should be the presence of contraindications to mechanical circulatory support. Such contraindications are often subjective and based on center experience. However, among the relevant considerations (even in the adolescent population who are overall likely to do well with a VAD) are: the presence of intractable life-threatening arrhythmias (despite normal electrolytes and intravenous anti-arrhythmic therapy), recurrent or severe gastrointestinal bleeding, recent or recurrent embolic or hemorrhagic stroke, dialysis-dependent patients requiring simultaneous heart-kidney transplant, hypercoagulable disorder, or the presence of a mechanical prosthetic valve.

Of note, given that there are no reliable predictors of RV failure after LVAD placement in pediatric patients, the concern for the need for biventricular support would not generally be deemed a contraindication to VAD placement.

Category 2: Restrictive or Hypertrophic Cardiomyopathy Patients

Patients with restrictive and hypertrophic cardiomyopathy may have higher mortality on the waitlist when not receiving Status 1A exceptions. The following table (Table 2) provides useful guidance for the review board when evaluating exception requests for candidates with these diagnoses.

Table 2: Recommended criteria for status exceptions

If the candidate has restrictive or hypertrophic cardiomyopathy and meets this criteria:	Then the candidate may be eligible for:

Is admitted to the transplant hospital that registered the candidate on the waiting list and meets *any* of the following criteria:
• Supported by *one* of the following:
  ○ A continuous infusion of at least one high-dose intravenous inotrope:
  ▪ Dobutamine greater than or equal to 7.5 mcg/kg/min
  ▪ Milrinone greater than or equal to 0.50 mcg/kg/min
  ▪ Epinephrine greater than or equal to 0.02 mcg/kg/min
  ○ A continuous infusion of at least two intravenous inotropes:
  ▪ Dobutamine greater than or equal to 3 mcg/kg/min
  ▪ Milrinone greater than or equal to 0.25 mcg/kg/min
  ▪ Epinephrine greater than or equal to 0.01 mcg/kg/min
  ▪ Dopamine greater than or equal to 3 mcg/kg/min
• Has had an episode of sudden death or recurrent prolonged runs of hemodynamically significant arrhythmia that are not controlled by medical therapy
• Has had syncopal episodes felt to be related to restricted ventricular filling
• Has evidence of increased pulmonary vascular resistance (exceeding 6 WU*m^2)
	Status 1A exception

Category 3: Single Ventricle Heart Disease

Patients with congenital heart disease are not generally disadvantaged by the current allocation system, where they receive 1A status as long as they are admitted and supported on continuous inotrope infusions. However, because certain single ventricle adult transplant candidates have had an increase in status (adult Status 4 [equivalent to pediatric 1B] for all congenital patients, with increased status assignments under specific circumstances), this has resulted in the incongruous circumstance where the same patient will have lower listing status as a child (< 18 years old) than as an adult (≥ 18 years). Accordingly, it appears appropriate to consider more urgent listing for many patients with single ventricle congenital heart disease, even where not supported by inotropes as an inpatient.

To provide more congruity between adult and pediatric listings, the following table should assist the National Heart Review Board members with evaluating exception requests for single ventricle congenital heart disease patients:

Table 3: Recommended criteria for status exceptions

If the candidate has single ventricle congenital heart disease and meets this criteria:	Then the candidate may be eligible for:
Is admitted to the transplant hospital that registered the candidate on the waiting list and is experiencing complications related to their congenital heart disease (including but not limited to: protein-losing enteropathy, plastic bronchitis, or Fontan circuit thrombosis), and is actively receiving therapy for said complication, without regard for change in the candidate's cardiac support	Status 1A exception
Has been palliated through a Fontan procedure and is listed for heart transplantation	Status 1B exception

Category 4: Coronary Allograft Vasculopathy and Retransplantation

Patients with a prior transplant do not have specific criteria within policy for qualifying for an urgency status higher than Status 2. However, many patients with coronary allograft vasculopathy develop a significant component of restrictive physiology and may not benefit from inotropes. Many patients with coronary allograft vasculopathy may have poor outcomes and a high-risk for sudden cardiac death without significant systolic dysfunction.

Table 4: Recommended criteria for status exceptions

If the candidate has a prior heart transplant and evidence of chronic rejection or significant coronary allograft vasculopathy and meets this criteria:	Then the candidate may be eligible for:
A history of recent cardiac arrest, or signs or symptoms placing patients at high-risk for sudden cardiac death, including any of the following: • A diagnosis of severe triple vessel disease, or • Significant restrictive hemodynamics • Non-sustained ventricular tachycardia • Unexplained syncope • Inotrope dependence	Status 1A exception
A history of revascularization (either surgical or transcatheter) for coronary allograft vasculopathy	Status 1B exception

OPTN

Request for Feedback

Update on the Continuous Distribution of Organs Project

OPTN Lung Transplantation Committee

Prepared by: James Alcorn
UNOS Policy and Community Relations Department

Contents

Update on the Continuous Distribution of Organs Project

Sponsoring Committee: *Lung Transplantation*
Public Comment Period: *August 4, 2020 – October 1, 2020*

Executive Summary

This request for feedback provides an update to the community about the continuous distribution of organs. Continuous distribution means replacing the current classification approach, which draws hard boundaries between types of patients (compatible vs. identical; sensitized vs not; inside a circle vs. outside), with a composite score that takes into account all of a candidate's characteristics. This score will be constructed with multiple attributes which align with NOTA and the OPTN Final Rule. This paper builds upon the 2019 concept paper[1] and contains updated information about the attributes that have been discussed by the Lung Committee (Committee)[2], how these attributes align with NOTA and the OPTN Final Rule, and how this work to date may influence the eventual conversion of other organs to continuous distribution. Finally, this paper provides an overview of the policy development approach and timeline for continuous distribution of lungs and other implementations, along with a request for community members to provide feedback in a prioritization exercise.

The end of this document has a glossary of terms to help readers.

[1] OPTN Thoracic Committee. 2019. *Continuous Distribution of Lungs, concept paper* available at: https://optn.transplant.hrsa.gov/media/3111/thoracic_publiccomment_201908.pdf.

[2] On July 1, 2020 the OPTN Thoracic Organ Transplantation Committee was split into separate Heart and Lung Transplantation Committees. Moving forward, the Lung Committee will sponsor this project. Prior to this, the majority of these discussions took place in either the former Lung Subcommittee of the Thoracic Transplantation Committee or the Continuous Distribution Workgroup under the Lung Subcommittee. For ease of reference, all references to those committees, subcommittees, and workgroups will collectively be referenced as the Lung Committee.

Background

Continuous distribution means replacing the current classification approach, which draws hard boundaries between types of patients (compatible vs. identical; sensitized vs not; inside a circle vs. outside), with a composite score that takes into account all of a candidate's characteristics. This score would be constructed with multiple attributes which align with NOTA and the OPTN Final Rule. To construct the score, the Committee must make two general decisions: 1) How much weight or importance to place on each attribute and 2) how to rate candidates within each attribute. Regarding the ratings, the Committee has been and will continue to work with OPTN and SRTR researchers to develop evidence based rating scales for each attribute. (For example, how much priority to give to a blood type O vs blood type AB candidate in order to provide equity in the system.)

As explained in the 2019 concept paper[3], hard boundaries create inequities for candidates on those edges. Candidates are placed into distinct classifications based upon their specific clinical criteria. Candidates are sorted within those classifications based upon medical priority and waiting time, but cannot move between classifications. For example, in **Figure 1** candidates A, B, and C are similar distances from the donor hospital but in different geographic zones. The current classification framework prioritizes zones before differences in medical urgency;[4] therefore, candidates A and C would receive the organ offer before candidate B. This happens regardless of any differences in medical urgency or candidate biology. By using a points-based framework instead of a classification-based framework, we can account for both considerations.

Figure 1: Hypothetical Candidates

Factors	Candidate A	Candidate B	Candidate C	Candidate D
Medical Urgency	Medium	High	Low	Medium
Distance from Donor Hospital	249 NM	251 NM	230 NM	300 NM
Candidate Biology (compatibilty)	Medium	Low	Medium	High
1 year survival after transplant	High	Medium	High	Low

[3] OPTN Thoracic Committee. 2019. *Continuous Distribution of Lungs, Concept Paper*.
[4] LAS is a composite score that contains measures for one-year waitlist mortality and post-transplant survival. In this way, lung allocation already has a composite score that weighs different attributes. Their experience developing this score is one of the reasons that lung is the first organ to transition to a continuous distribution framework.

These hard boundaries are inherent in a classification based system that prevents candidates from moving between classifications. The classification-based system, which currently precludes all patients in a lower classification from being prioritized ahead of any patients in a higher classification, irrespective of considerations regarding medical need, inequities in access, or benefit of transplantation. (See Error! Reference source not found..) A continuous distribution framework will eliminate hard boundaries resulting from the current system, in which candidates are grouped into classifications (e.g., adults in Zone A) and then sorted by their LAS within each classification. Instead, candidates will receive points for various attributes and all of these attributes can be considered as part of a composite allocation score. (See Error! Reference source not found..) A candidate's composite allocation score will determine the order in which the candidate will receive an organ offer.[5]

Figure 2: Sample Allocation Policy (Current)

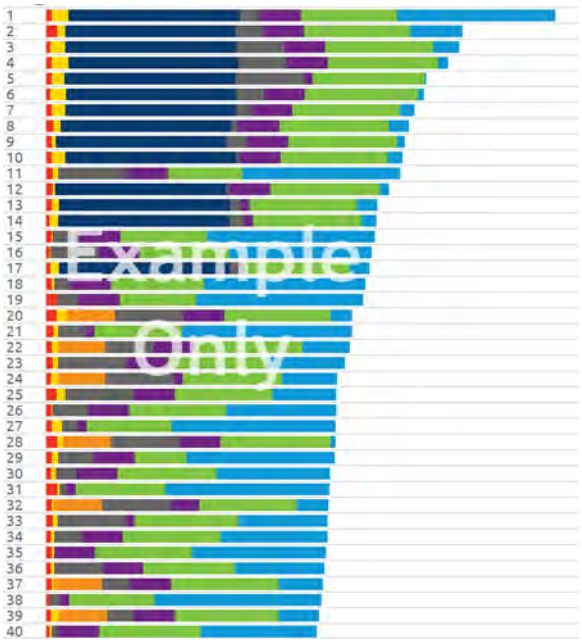
Note that candidates are placed into specific classifications and cannot move between them.

Table 6-7: Allocation of Hearts from Deceased Donors At Least 18 Years Old

Classification	Candidates that are within the	And registered at a transplant hospital that is at or within this distance from the donor hospital
1	Adult status 1 or pediatric status 1A and primary blood type match with the donor	500NM
2	Adult status 1 or pediatric status 1A and secondary blood type match with the donor	500NM
3	Adult status 2 and primary blood type match with the donor	500NM
4	Adult status 2 and secondary blood type match with the donor	500NM
5	Adult status 3 or pediatric status 1B and primary blood type match with the donor	250NM
6	Adult status 3 or pediatric status 1B and secondary blood type match with the donor	250NM
7	Adult status 1 or pediatric status 1A and primary blood type match with the donor	1000NM
8	Adult status 1 or pediatric status 1A and secondary blood type match with the donor	1000NM
9	Adult status 2 and primary blood type match with the donor	1000NM
10	Adult status 2 and secondary blood type match with the donor	1000NM
11	Adult status 4 and primary blood type match with the donor	250NM
12	Adult status 4 and secondary blood type match with the donor	250NM
13	Adult status 3 or pediatric status 1B and primary blood type match with the donor	500NM

Figure 3: Example Match Run (Proposed)

Each color represents a different attribute and the length of the bar shows the points credited to that attribute. Note that candidates receive points for multiple considerations and can move up or down depending on each attribute.



The Committee will use multiple methods, as explained later, to construct the weights or priorities for each attribute. The attribute weights and rating scales applied to each candidate will result in a composite allocation score. The match run in continuous distribution will then sort candidates based on their composite allocation score. This will allow the community to balance competing attributes and remove the inequities that exist with edge cases right now.

The Committee has worked since last fall to review the feedback from the concept paper, review additional attributes, and refine the concept for the composite allocation score. This paper provides an update on that analysis, the plan forward for the project, and a request for your participation in the project.

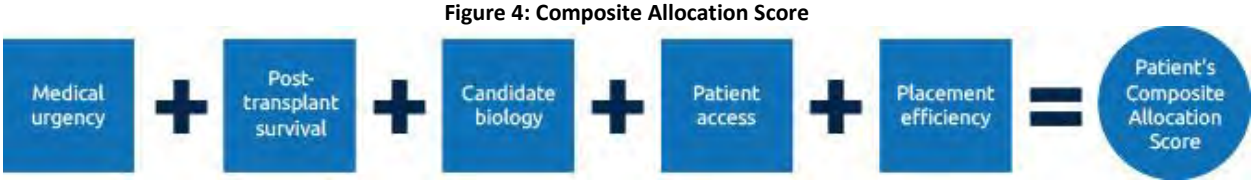
[5] OPTN Thoracic Committee. 2019. *Continuous Distribution of Lungs, Concept Paper*.

Composite Allocation Score

The Committee divided the composite allocation score into five broad goals and patient attributes within each goal. The goals, as described below, align with various requirements in NOTA and the OPTN Final Rule and are broad enough that they can be used across the different organ systems.

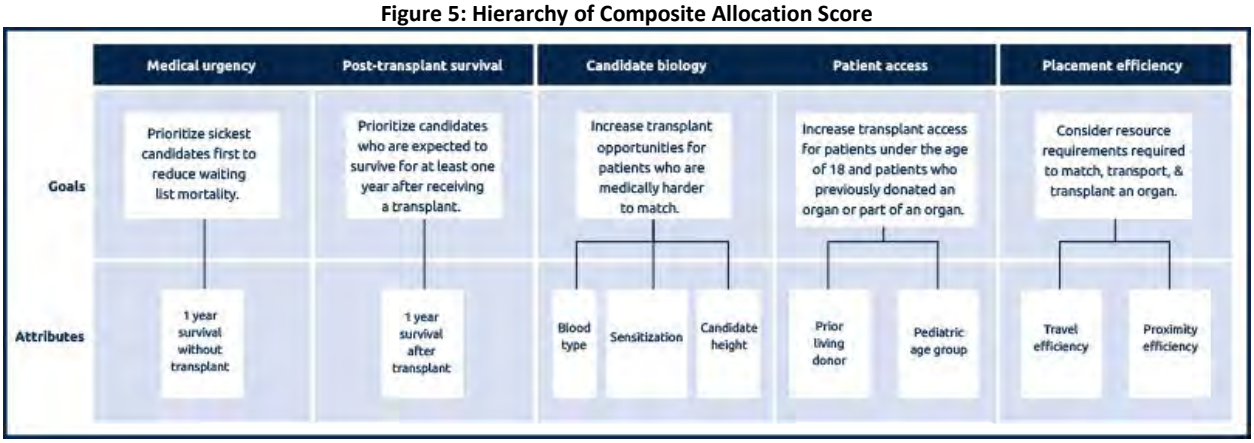
More specifically, continuous distribution will prioritize waiting list candidates based on a combination of points awarded for factors related to medical urgency, post-transplant survival, candidate biology, patient access, and the efficient management of the organ placement system.

Figure 4: Composite Allocation Score



The hierarchy of the composite score shows goals, attributes, and rating scales. (See **Figure 5**.) The goals relate to the OPTN's goals for developing equitable allocation policies as defined by the OPTN Final Rule and are consistent across the organs. The attributes are the organ specific criteria that support each goal. Rating scales use data to score each candidate. Allocation policy goals – for example, prioritizing the most urgent patients and maximizing post-transplant survival – may be in tension, and continuous distribution aims to prioritize patients in a way that balances all five goals in a transparent way. The specific attributes, their weights, and their rating scales will be organ specific. The attributes align with the ethical principles of utility (for the purposes of this project, the hierarchy splits utility into medical utility and system efficiency) and equity.[6]

Figure 5: Hierarchy of Composite Allocation Score



In building the above hierarchy, the Lung Committee considered several attributes. The Committee began with the attributes that are in current policy then considered new attributes suggested during 2019 public comment. Below is an overview of those attributes the Committee is not anticipating to include in the composite allocation score. The attributes are further explained after the table.

[6] OPTN. 2020. *Ethics - Ethical Principles in the Allocation of Human Organs – OPTN* available at: https://optn.transplant.hrsa.gov/resources/ethics/ethical-principles-in-the-allocation-of-human-organs/.

Table 1: Attributes Considered by the Lung Committee but Not Anticipated to be Included

Goal	Attribute(s)
Maximizing organ use	Likelihood of acceptance, use of screening tools, use of OPTN efficiency tools,
Improve Post Transplant Survival	Ex vivo perfusion
Improve Post Transplant Survival	HLA matching
Improve Post Transplant Survival	Ischemic time
Improve Post Transplant Survival	Size matching
Candidate Biology	Multiorgan
Improve Patient Access	Age matching
Improve Patient Access	Waiting time Do not include as an attribute at this time, but continue to use as a tiebreaker
Improve Placement Efficiency	Likelihood of Placement
Improve Placement Efficiency	Aura placement
Improve Placement Efficiency	Population density

Medical Urgency

The first goal in the hierarchy of attributes is prioritizing medically urgent patients. The OPTN Final Rule calls for allocation policies to "seek to achieve the best use of donated organs."[7] One-way to achieve the best use of a donated organ is to transplant it into a candidate who has the greatest medical urgency. Also, the Final Rule calls for the OPTN to "[set] priority rankings … for patients or categories of patients who are medically suitable candidates for transplantation to receive transplants. These rankings shall be ordered from most to least medically urgent…"[8] With this in mind, the Lung Committee looked to current policy for how to rank candidates according to medical urgency.

Current policy uses the Lung Allocation Score (LAS) for candidates 12 years and older.[9] The LAS is a composite score that considers each candidate's predicted waitlist mortality and post transplant survival. Candidates under 12 are allocated using priority levels 1 and 2; these work similarly to statuses in liver and heart allocation. Because lung policy currently uses these two different methods to rank the medical urgency of lung candidates 12 years and older versus those under 12, the Committee must decide how to compare these candidates. For example, what is the LAS equivalency of Priority 1 and 2? The Committee will review clinical data to compare the waitlist mortality of Pediatric Priority candidates with the waiting list mortality part of LAS among adult candidates. This analysis provides an evidence based way to compare the waitlist mortality of adult and pediatric patients. Importantly, pediatric

[7] 42 CFR Sec. 121.8(a)(2).
[8] 42 CFR Sec. 121.8(b)(2).
[9] OPTN Policy 10.1 *Priorities and Score Assignments for Lung Candidates.*

patients will also receive extra points associated with patient access, to ensure the unique needs of children are adequately considered in the new composite score approach. See below for more details.

It is also worth noting the Lung Committee is sponsoring a separate policy proposal to update the cohort and coefficients used to calculate the two parts (waiting list mortality; post-transplant survival) of LAS.[10] Part of those discussions involved whether to change from a one-year post transplant survival model to a three-year post transplant survival model. That change was out of scope for the project but the Committee is still interested in further evaluating that topic apart from the first iteration of continuous distribution. The OPTN Board of Directors last updated the LAS in 2012.[11] The new composite score will use these updated LAS components.

Other Organs

Other organs contain similar scoring systems for prioritizing candidates based upon medical urgency or waitlist mortality. For example, liver candidates are prioritized using the Model for End Stage Liver Disease (MELD) and Pediatric End Stage Liver Disease Model (PELD) systems, whereas heart candidates are prioritized using six statuses. All of these are meant to represent the medical urgency of those candidates.

Post Transplant Survival

The next goal in the hierarchy of attributes is post transplant survival. The OPTN Final Rule calls for allocation policies "to avoid futile transplant."[12] Placing organs into candidates predicted to have better post transplant survival and produce the most life years/benefit per organ is an attempt to avoid futile transplants. With this in mind, the Lung Committee looked to current policy for how to rank candidates according to post transplant survival.

As mentioned previously, the LAS is a composite score that contains measures for one-year waitlist mortality and post-transplant survival. The Committee will analyze the post-transplant survival of candidates that receive an LAS or a Pediatric Priority level. In this way, both adult and pediatric candidates will receive an evidence-derived score for estimated post transplant survival. Importantly, pediatric patients will also receive extra points associated with patient access, as described further below.

Some other organ specific policies already have scoring systems to predict post transplant survival or outcomes (ex. the use of EPTS in kidney allocation). For other organs, this is an opportunity for future enhancements to those systems. If an organ system currently does not have a scoring system to predict post transplant survival or outcomes, the effective weight of this attribute would be zero (0%) until they build an evidence based scoring system.

Other Attributes Considered

The Committee discussed other potential attributes related to post transplant outcomes, including:

- Ischemic Time and
- Candidate Height Matching.

Ischemic Time

The Committee researched and debated whether to include predicted ischemic time into this goal. Their original hypothesis was that increased distance between the donor hospital and transplant hospital

[10] OPTN, *Updated Cohort for Calculation of the Lung Allocation Score (LAS).* August 2020.
[11] OPTN. 2012. *Proposal to Revise the Lung Allocation Score (LAS) System Briefing Paper*.
[12] 42 CFR Sec. 121.8(a)(2).

would mean longer ischemic times and poorer post-transplant outcomes for the recipient. For example, **Figure 6** represents the logic of the argument: As travel distance increases, the mode of transportation changes from driving flying; this impacts the speed of travel and total transit time; increased transit time relates to increased ischemic time; and increased ischemic time relates to transplant outcomes. The Committee therefore sought a rating scale that would rank candidates based on their predicted travel-related ischemic time and post-transplant outcomes.

Figure 6: Ischemic Time

Discussions focused on how to predict ischemic time with information known at the time of the match run. SRTR staff presented a method for predicting ischemia time based on information known at the time of the match run. Since ischemia time is not known at the time of the match run, ischemia time must be estimated based on a variable that is known, like distance. SRTR analysis showed there is much variability in the relationship between ischemia time and distance but there is an upward trend, and the average ischemia time is higher for transplants at 1,000 miles than at 100 miles.[13] The upward trend is mostly linear after 500 miles. The high variability in the relationship between ischemia time and distance causes concern for using straight line distance, or transit time as predictors for post transplant outcomes. (See Error! Reference source not found..) At shorter distances, ischemia time differs based on variables that have nothing to do with distance, like the complexity of the transplant procedure. In these situations, it is the patient's circumstances that dictate the ischemia time and the outcome, not the distance. While longer ischemia times could impact outcomes in some situations, this is not reflected in OPTN data because transplant programs do not accept organs when ischemia time is expected to be problematic. After much discussion, the challenges in accurately predicting travel-related ischemia time and the low correlation between ischemic time and either straight line distance or predicted travel time provided reason for the Committee to exclude ischemic time in the composite allocation score at this time.

[13] SRTR. 2020. *LU2020_01, Data Request from the Continuous Distribution Workgroup of the OPTN Thoracic Committee*.

Figure 7: Predicting CIT from Distance[14]

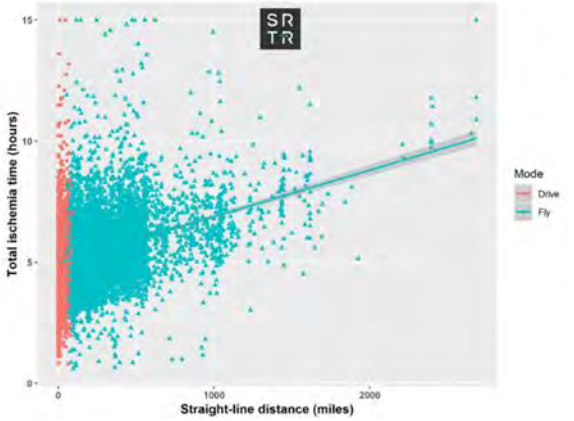
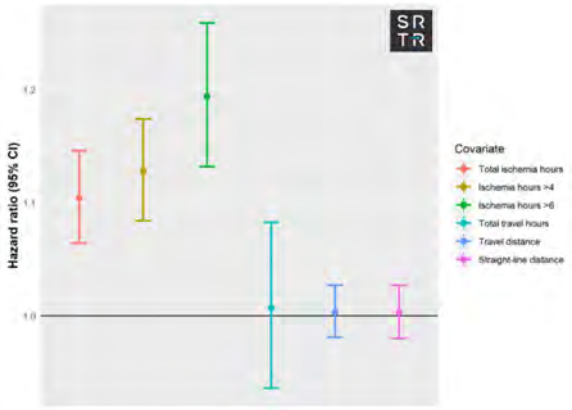


Figure 8: Functional Form of Ischemia / 1-Year Survival Relationship[15]



The effect of different donor characteristics and ischemic time were also evaluated through SRTR data and literature.[16] In reaching its decision to not include travel-related ischemic time in the composite allocation score, the Committee also took into account findings from the Mulhivill paper which concluded, "Neither ischemic time nor interaction of ischemic time and donor age were significantly associated with overall survival. There does not appear to be an interaction between donor age and ischemic time."[17]

Though SRTR analyses revealed a positive, statistically significant relationship between total ischemic time and lung recipient survival, the same analysis found no relationship between distance and lung recipient survival.[18] After extensive discussion, the Committee determined that this observed relationship reflected non-travel related ischemia associated with unmeasured causes related to patient acuity and surgical complexity, and the association between travel-related ischemia and post-transplant outcomes was weak or non-existent.

Candidate Height Matching

The Committee discussed the role of size matching at their in-person meeting last fall.[19] Size matching is part of UNet's℠ donor screening criteria and serves a significant role in hospital acceptance practices but current lung allocation policy does not use it to prioritize candidates. The Committee agreed with the literature which showed size matching holds promise for predicting post-transplant outcomes[20] But

[14] Id., Figure 3.
[15] Id., Figure 8.
[16] Meyer, et. al. 2000. *Effect of Donor Age and Ischemic Time on Intermediate Survival and Morbidity after Lung Transplantation*." Mulvihill, et. al. 2017. *The association of donor age and survival is independent of ischemic time following deceased donor lung transplantation*.
[17] Id.
[18] SRTR (2020).
[19] OPTN. Oct. 17, 2019. *Minutes of Thoracic Committee*, available at: https://optn.transplant.hrsa.gov/media/3330/20191017_thoracic-committee_minutes.pdf.
[20] Eberlein, Michael, and Robert M Reed. 2016. *Donor to Recipient Sizing in Thoracic Organ Transplantation*. World Journal of Transplantation 6 (1): 155–64. https://doi.org/10.5500/wjt.v6.i1.155. Keeshan, Britton C., Joseph W. Rossano, Nicole Beck, Rachel Hammond, James Kreindler, Thomas L. Spray, Stephanie Fuller, and Samuel Goldfarb. 2015.*Lung Transplant Waitlist Mortality: Height as a Predictor of Poor Outcomes*. Pediatric Transplantation 19 (3): 294–300. https://doi.org/10.1111/petr.12390.

the Committee nonetheless agreed that this wasn't a necessary additional and would require extensive analysis right now so it will not include size matching at this time but might include it in a future change to lung allocation.

Candidate Biology

The next goal in the hierarchy of attributes is candidate biology, or increasing transplant opportunities for patients who are medically harder to match. The OPTN Final Rule calls for allocation policies to "promote patient access."[21] Some candidates have difficulty finding a suitable donor due to biological incompatibilities. The OPTN has long used different mechanisms, for example the CPRA sliding scale in kidney allocation policy, to reduce these biological differences in transplant access.[22] With this in mind, the Lung Committee looked to current policy for 1) which disadvantages to include and 2) how to prioritize candidates according to their candidate biology. After much discussion, the Committee agreed to include the following three disadvantages:

- Blood type
- Highly sensitized
- Candidate height

Other organs

The topic of candidate biology that affects differences in transplant access is not unique to lung allocation. Every organ system includes some attempt to reduce these differences. The approaches used to address these differences in lung allocation can be replicated using clinical data or different attributes for other organs.

In this way, it is a data driven decision about how to prioritize candidates according to different heights, blood types, or sensitization levels and how much priority to give for height vs. blood type or sensitization. It is then a values laden question about how much weight should be given to Decrease Biological difference in transplant allocation vs. placement efficiency, medical urgency, or post-transplant outcomes.

Because all three attributes consider the same clinical issue (disadvantages in transplant access due to biological incompatibility with donors), we can use clinical data to inform the degree to which these attributes and their levels should be prioritized in the composite allocation score. OPTN data can show the factors which influence a candidate's access to transplant.[23] These data can also show the relative importance of each factor in determining a candidate's access. This relative importance can be used to empirically weigh these attributes.

Blood Type

The Committee discussed the role of blood type in lung allocation. Lung allocation currently classifies candidates according to identical, compatible, intended incompatible, and incompatible blood type with the donor matches. This general framework has been in place since the earliest lung allocation policies.[24] The Committee discussed whether the purpose of these policies was to promote post-transplant

[21] 42 CFR Sec. 121.8(a)(5).
[22] OPTN Policy 8.3, Table 8-2 *Points for CPRA.*
[23] OPTN. 2020. *Access to Transplant: Lung Equity Dashboard*, available at: https://insights.unos.org/equity-in-access/.
[24] Egan, T.M., Murray, S., Bustami, R.T., Shearon, T.H., McCullough, K.P., Edwards, L.B., Coke, M.A., Garrity, E.R., Sweet, S.C., Heiney, D.A. and Grover, F.L. 2006, *Development of the New Lung Allocation System in the United States*. American Journal of Transplantation, 6: 1212-1227. https://doi:10.1111/j.1600-6143.2006.01276.x

outcomes or to provide equity in the system. The Committee reviewed relevant articles and agreed the purpose for distinguishing candidates based on blood type was to promote patient access and provide equity in the system, not due to post-transplant survival concerns.[25] The composite scoring system will award differential point values for A, B, AB, and O patients based on clinical data reflecting the portion of available lung donors with which each group is blood type compatible.

The framework of prioritizing identical donors over compatible donors is found in other organs. Similarly, some of the other organ systems also contain a preference for blood type O candidates to provide equity in the system. The analysis performed for the continuous distribution of lungs provides a framework for how this analysis can be performed for other organ systems as well.

Highly Sensitized

Lung allocation policy currently prioritizes highly sensitized lung candidates.[26] This policy aim to grant greater access for these candidates who might otherwise struggle to receive organ offers. Right now, the policy requires hospitals to receive agreement from transplant programs who registered the candidates higher on the match run. Also, public comment from 2018 and recent literature shows the community's wish to address this issue.[27]

The Committee reviewed relevant literature and similar policies in other organs and agreed that use of the CPRA sliding scale should be developed as the basis for assigning points to highly sensitized candidates based on sensitization level. While members are not required to submit unacceptable antigen information similar to kidney candidates,[28] a CPRA can be calculated for those candidates that do enter the information. Literature shows that while the CPRA was designed with kidney candidates in mind, it is a good predictor of the level of sensitization in thoracic candidates.[29] This model could be expanded to other organs (ex. liver or heart) that do not have points based mechanisms for prioritizing highly sensitized candidates. This approach also could be used to smooth out the CPRA points curve used in kidney allocation and address the issue about access for the most highly sensitized candidates. Therefore, the Committee agreed to include priority points dependent on the sensitization level of candidates.

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[25] Barac YD, Mulvihill MS, Cox ML, et al. 2019 *Implications of blood group on lung transplantation rates: A propensity-matched registry analysis*. J Heart Lung Transplant. 38(1):73-82.

[26] OPTN Policy 10.2.A: *Allocation Exception for Highly Sensitized Patients*.

[27] OPTN. 2018. *Modifications to the distribution of deceased donors lungs, briefing paper*, available at: https://optn.transplant.hrsa.gov/media/2523/thoracic_boardreport_201806_lung.pdf.
Ericheok Tague LK, Witt CA, Byers DE, et al. 2019. *Association between Allosensitization and Waiting List Outcomes among Adult Lung Transplant Candidates in the United States*. Ann Am Thorac Soc. 16(7):846-852.

[28] OPTN Policy 4.3.B *HLA Typing for Candidates*

[29] Kucheryavaya A, Callahan L Robbins, Edwards L. 2015. *Kidney Vs. Heart Calculated PRA (CPRA) for Sensitized Heart Candidates: Does Donor Ethnic Distribution Make a Difference?* [abstract]. Am J Transplant. 15 (suppl 3), available at https://atcmeetingabstracts.com/abstract/kidney-vs-heart-calculated-pra-cpra-for-sensitized-heart-candidates-does-donor-ethnic-distribution-make-a-difference/. Kransdorf EP, Kittleson MM, Patel JK, Pando MJ, Steidley DE, Kobashigawa JA. 2017 *Calculated panel-reactive antibody predicts outcomes on the heart transplant waiting list*. J Heart Lung Transplant. 36(7):787-796. Barac, Y.D. et al. 2019. *High Calculated Panel Reactive Antigen (cPRA) is Associated with Decreased Rates of Transplantation and Increased Waitlist Mortality in Lung Transplantation: A UNOS/OPTN Registry Analysis*. The Journal of Heart and Lung Transplantation, Volume 38, Issue 4, S148. https://doi.org/10.1016/j.healun.2019.01.353

Candidate Height

As mentioned above, the Committee agreed with the literature that showed size matching holds promise for predicting post-transplant outcomes.[30] However, the Committee also agreed this would require extensive analysis right now so excluded size matching at this time. Separately, literature shows that a candidate's height can influence their access to transplant.[31] Therefore, the Committee agreed to include priority points dependent on the candidate's height alone, not the relationship between the candidate and donor heights.

Patient Access

The next goal in the hierarchy of attributes is ensuring patient access according to the OPTN Final Rule requirement for allocation policies to "promote patient access."[32] Across the organs, OPTN policy currently prioritizes access for two candidate populations:

- Candidate age groups
- Prior living donors

Candidate Age Groups

The Committee discussed the role of age in lung allocation. Candidate age is currently used to prioritize younger candidates (under 12 years old before 12-17, then 18 years and older) for lungs from pediatric donors and prioritizes older candidates (12 years or older) for lungs from adult donors.[33] The OPTN Board adopted these policies in 2015 to address the barriers to transplantation that pediatric candidates face.[34] Currently, age distinguishes candidates into classifications before medical urgency is considered. For lungs from donors younger than 18 years old, an 11-year old candidate will generally receive the organ offer before a 12 to 17-year old candidate at similar distances – irrespective of any difference in medical urgency. The prioritization for lungs from older adult donors also uses age classifications to generally prioritize adults and adolescents (aged 12-17 at the time of the offer) over pediatric candidates.

Similar to lung, age groups are used in almost of all the organ systems to classify donors or candidates, most notably to award priority for pediatric candidates. Before the Committee makes final decisions about the use of age, they will consider previous attempts by the OPTN to use age in organ allocation.[35] In 2011, HHS Office of General Counsel and Office of Civil Rights provided advice about the use of age in

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[30] Eberlein, Michael, and Robert M Reed. 2016. *Donor to Recipient Sizing in Thoracic Organ Transplantation*. World Journal of Transplantation 6 (1): 155–64. https://doi.org/10.5500/wjt.v6.i1.155. Keeshan, Britton C., Joseph W. Rossano, Nicole Beck, Rachel Hammond, James Kreindler, Thomas L. Spray, Stephanie Fuller, and Samuel Goldfarb. 2015. *Lung Transplant Waitlist Mortality: Height as a Predictor of Poor Outcomes*. *Pediatric Transplantation* 19 (3): 294–300. https://doi.org/10.1111/petr.12390.

[31] Sell, Jessica L., et. Al. 2016. *Short Statute and Access to Lung Transplantation in the United States: A Cohort Study*. American Journal of Respiratory and Critical Care Medicine 193(6): 681-88.

[32] 42 CFR Sec. 121.8(a)(5).

[33] OPTN Thoracic Transplantation Committee. Dec. 2015, *Proposal to Modify Pediatric Lung Allocation Policy briefing paper*.

[34] OPTN, Dec. 2015. *Proposal to Modify Pediatric Lung Allocation Policy policy notice*, available at: https://optn.transplant.hrsa.gov/media/2075/policynotice_20151201_ped_lung_policy_changes.pdf.

[35] Eidelsen, Benjamin, 2013. *Kidney Allocation and the Limits of the Age Discrimination Act*, Yale Law Journal (2013). Persad, Govind. 2019. *Evaluating the Legality of Age-Based Criteria in Health Care: From Nondiscrimination and Discretion to Distributive Justice*, Boston College Law Review. Sweet SC, Barr ML. 2014. *Pediatric lung allocation: the rest of the story*. Am J Transplant. 14(1):11-2.

kidney allocation. "[HRSA] shared that according to the stipulations in the [Age Discrimination] Act[36], age may be used if it is a proxy for medical variables. Therefore, the use of age in the calculation of estimated post transplant survival (EPTS) was not of concern because the evidence has shown that age is a suitable proxy for variables such as cardiovascular disease which are not available in the OPTN dataset. However, in the [kidney] concept document, the use of age matching within 15 years appeared to be arbitrary in that candidates who are sixteen years older or younger than a donor are not substantially clinically different than those who have 14 years of age difference." [37]

For these reasons, the Committee has favored a points based system that distinguishes candidates that are under 18 years old from those that are at least 18 years old. This would remove the priority granted to candidates 12-17 years old. Drawing the line at 18 years old is consistent with NOTA's requirement to "recognize the differences in health and in organ transplantation issues between children and adults throughout the system and adopt criteria, policies, and procedures that address the unique health care needs of children.."[38] This is also consistent with the OPTN's Ethical Principles of Pediatric Organ Allocation, which concludes: "Drawing from regulatory guidance and ethical principles, we find that there is a reasonable basis for giving preference to pediatric transplant candidates for allocation. This preferential allocation must take into account the organ-specific clinical context faced by candidates of all ages."[39] Therefore, the committee agreed to provide priority for candidates under 18 at the time of organ offers but not further distinguish between candidates 0-11 and 12-17. While this eliminates one type of priority for pediatric candidates, these candidates should not have decreased access to transplant so long as the attribute for pediatric priority is sufficiently large.

The Committee has also agreed to provide this same pediatric priority for both pediatric and adult donor lungs. This may decrease access to adult donor lungs for adult candidates, however any impact is expected to be small due to the lung waiting list having relatively few pediatric candidates. The impact of this decision is expected to be beneficial for taller pediatric candidates but not very impactful on adult candidates due to the relatively small number of pediatric candidates compared to adult candidates.

Prior Living Donors

Living donation is generally considered to be safe and end stage organ failure is relatively rare among living donors.[40] Starting in 1996, prior living donors have received priority for kidney transplants.[41] To be consistent with kidney allocation policy, the Committee favors adding priority points for prior living donors.[42] Living lung donation is rarely performed in the United States.[43] However, living donors can donate a portion of their lung and could need a subsequent lung transplant. The Committee agreed to

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[36] 42 U.S.C. §§ 6101-6107 (2006).
[37] OPTN Kidney Transplantation Committee. Aug. 26, 2011. *Meeting Minutes*.
[38] 42 USC Sec. 274(b)(2)
[39] Available at: https://optn.transplant.hrsa.gov/resources/ethics/ethical-principles-of-pediatric-organ-allocation/.
[40] Wainright et al. 2017. *The Impact of the New Kidney Allocation System on Prior Living Kidney Donors' Access to Deceased Donor Kidney Transplants: An Early Look. Transplantation.* 17: 1103-111. https://doi: 10.1111/ajt.14102 *citing* Muzaale AD, Massie AB, Wang MC, et al. 2014. *Risk of end-stage renal disease following live kidney donation*. JAMA 311: 579– 586. and Mjoen G, Hallan S, Hartmann A, et al. 2014. *Long-term risks for kidney donors*. Kidney Int. 86: 162– 167.
[41] Smith JM, Biggins SW, Haselby DG, et al. 2012. *Kidney, pancreas and liver allocation and distribution in the United States*. Am J Transplant. 12(12):3191-212. https://doi.org/10.1111/j.1600-6143.2012.04259.x
[42] OPTN Policy 8.3: *Kidney Allocation Points*. During its June 26-27, 1996 meeting, the Board first adopted a change permitting the assignment of points to kidney candidates that are prior living donors.
[43] Domino donors also occur. However, since this donors also receive a transplant at the time of those donation, we might not want to include them in this category.

add priority for *all* prior living donors of any solid organ, not just a partial lung, to be consistent with the kidney allocation policy.

Since 1996, the transplant community has repeatedly expressed, that in their medical judgement, prior living donors should be prioritized for transplant. While developing the Revised Kidney Allocation System (KAS), the Kidney Committee states that "[P]rior living donor priorities were determined to be important not only from the standpoint of patient care, but also from a public perception standpoint."[44] In response to a 2012 public comment proposal that clarified this prioritization, the Ethics Committee noted that "[u]nder the same principles that support the priority for kidney allocation, there should be consideration to grant priority for living donors of other organs."[45] The Living Donor Committee commented that, "[t]he Committee also questioned if prioritization (special exception points) should be provided for prior liver (and/or lung) donors who may need to be listed for liver (or lung) transplant." In 2015, "The Joint Societies Work Group previously developed recommendations for living liver donor consent, medical evaluation as well as living donor follow-up; the work group also identified a possible need for a policy to prioritize prior living liver donors who need a liver transplant, similar to the priority provided to living kidney donors who subsequently need a kidney transplant."[46] In 2019, the Kidney Committee released a public comment proposal that, among other things, impacted the prioritization of prior living donors. Public comment showed positive support for prioritizing prior living donors.[47]

This attribute is in alignment with NOTA and the OPTN's Final Rule requirement to develop organ allocation policies based upon sound medical judgment and achieve the best use of organs. The record shows that reasonably prudent physicians, knowledgeable about transplant and the allocation system, agree with this prioritization. In 2012, when the Ethics Committee was reviewing (KAS), they noted that prioritization of prior living donors was a utility component when discussing the utility vs. equity balance in KAS.[48] This is relevant in that it further cements that this attribute helps achieve the best use of organs, which is a requirement in the OPTN Final Rule for allocation policies.

Waiting Time

Waiting time is used as a tiebreaker in current lung allocation.[49] Because LAS is calculated to 16 decimal places, it is rare that waiting time is ever needed to break a tie LAS; however, waiting time is often used to break ties between pediatric priorities. Waiting time is used due to a sense of fairness or to promote patient access. Waiting time is already captured along a scale with priority given to candidates with more waiting time. A points-based model could similarly give some weight to waiting time and prioritize candidates with more waiting time.

After discussion, the Committee agreed *not* to include waiting time as an attribute but instead favored its continued use as a tiebreaker if the composite allocation score results in a tie. While it is unlikely that ties would exist in this new framework, the potential does exist – most commonly for review board exceptions. This decision is also consistent with published literature on the role of waiting time in organ allocation. A report commissioned from the Institute of Medicine states that organ allocation should be

[44] OPTN. Dec 13, 2006. *Kidney Committee Report to Board*.
[45] OPTN. April 2, 2012 *Minutes from Meeting of Ethics Committee*.
[46] *Letter from Liver Committee to Living Donor Committee*, Feb 23, 2015. Note: The Joint Societies contained representatives from the American Society of Transplant Surgeons, the American Society of Transplant, the National Association of Transplant Coordinators, the OPTN, and HRSA.
[47] OPTN. Aug. 19, 2019. *Minutes from Meeting of Kidney Transplantation Committee*.
[48] OPTN. Oct. 3, 2012 Minutes of Ethics Committee.
[49] OPTN Policy 10.4.A *Sorting Within Each Classification*.

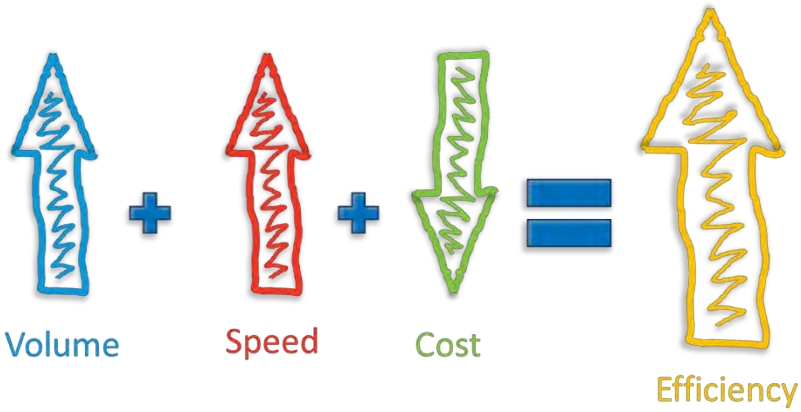
based on measures of medical urgency, while avoiding futile transplants, and *should minimize the effect of waiting time*.[50] A 2005 article stated, "An allocation system that is based on accumulated waiting time favors patients who are 'well enough' to wait the longest. A corollary is that patients with seniority in the current allocation scheme may have a better chance of longer survival time without undergoing transplantation, which was a finding both in the study by Hosenpud *et al* (6) and in analyses performed by the Lung Allocation Subcommittee.[51] For these reasons, the Committee decided to keep waiting time for breaking ties in candidate scores but not to include it as a weighted attribute.

Promoting the Efficient Management of Organ Placement

The next goal in the framework of attributes is increasing the efficient management of organ placement [52] The OPTN Final Rule does not define the "efficient management of organ placement." However, a Federal Register notice related to the development of the OPTN Final Rule can provide some guidance for interpreting this clause. It stated:

> Broad geographic sharing should not come at the expense of wasting organs through excessive transportation times. Efficient management of organ allocation will sometimes dictate less transportation when the highest ranking patient can wait a day or two for the next available organ. Sound medical judgment must be exercised before a final decision on whether to transplant a particular organ into a particular patient.[53]

In considering attributes for efficiency, the committee discussed that it means to have an efficient organ placement system.[54] Efficiency can be thought of as increased volume/output (ex. more transplants), faster cycle times (ex. placement times or transportation times), or lower costs (ex. discards, or surgeon time). These three concepts usually require trade-offs. This is similar to the trade-offs between cost, quality, and speed in project management.[55]



In continuous distribution, we've been talking about the trade-offs between medical priority, equity, and system efficiency.

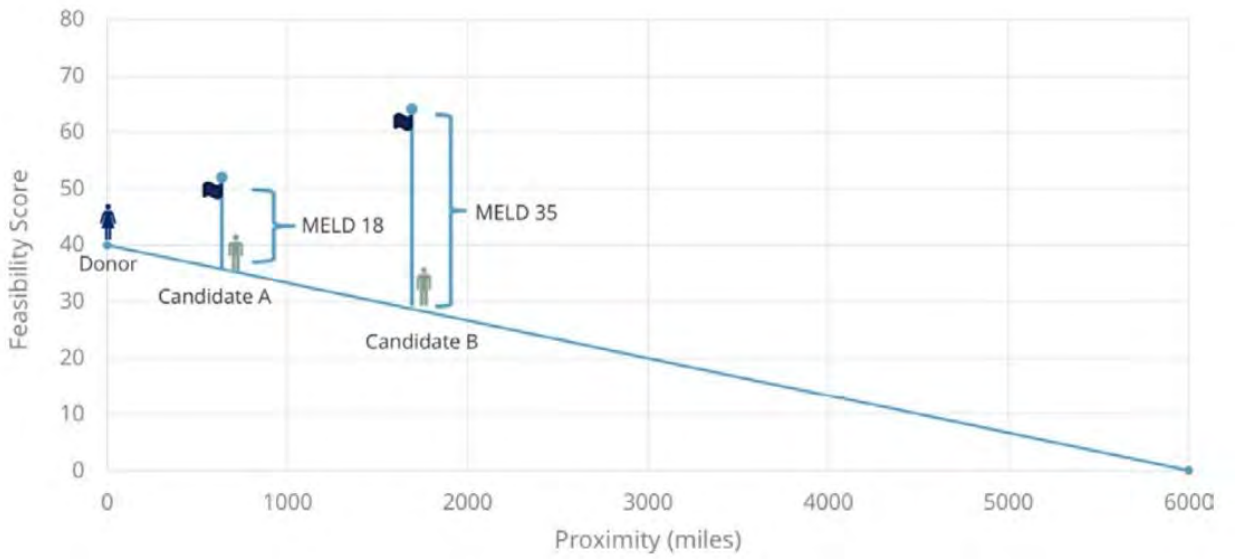
[50] Institute of Medicine, Committee on Non-Heart-Beating Transplantation II. 2000. *Non-heart-beating organ transplantation: practice and protocols*. Washington, DC: National Academy Press.
[51] Egan TM, Kotloff RM. 2005. *Pro/Con debate:* lung allocation should be based on medical urgency and transplant survival and not on waiting time. Chest. 128(1):407-15. *citing* JD Hosenpud, LE Bennett, BM Keck, et al. 1998. *Effect of diagnosis on survival benefit of lung transplantation for end-stage lung disease* Lancet, 351, pp. 24-27
[52] 42 CFR Sec. 121.8(a)(2).
[53] 63 FR 16315 (1998).
[54] OPTN, *Minutes from Meeting of Lung Continuous Distribution Workgroup,* June 18, 2020.
[55] Project Management Institute, *Project Management Book of Knowledge,* 2017.

Travel Efficiency or Cost

The Committee discussed travel efficiency. Members have expressed concern about transporting organs long distances for small differences in medical priority, especially when the candidates are less medically urgent. The farther an organ is transported, the more likely it is to travel by air than ground and the cost of transportation increases.[56] Financial costs are one aspect of overall system efficiency. The Committee received analysis from the SRTR to construct a rating scale related to the relative cost of transporting lungs over distance.[57]

General Proximity Scale

Another concept discussed by the Committee was a generic proximity attribute. This could either replace or be in addition to the above mentioned travel efficiency attribute. As explained below, the Committee discussed and rejected many other potential attributes because they did not feel that there was enough data to make an evidence based decision that justified their inclusion at this time. However, they noted a trend amongst some of the attributes: there was a relationship between efficiency and proximity between the donor and transplant hospital. For example, hospitals are less likely to accept organs that are from further away. Candidate density grows as distance grows which would prioritize candidates closer to the donor hospital. Surgeons are out of the hospital for longer periods of time if they have to procure an organ from further away. For these reasons, the committee decided to include a generalized proximity scale as a proxy for the efficiencies associated with proximity, that are not related to cost. This will be similar to the scale first proposed by Snyder et al.[58]



[56] Gentry SE, Chow EK, Dzebisashvili N, et al. 2016. *The Impact of Redistricting Proposals on Health Care Expenditures for Liver Transplant Candidates and Recipients*. Am J Transplant. 16(2):583-93. Dubay DA, Maclennan PA, Reed RD, et al. 2015. *The impact of proposed changes in liver allocation policy on cold ischemia times and organ transportation costs*. Am J Transplant. 15(2):541-6.

[57] SRTR, Feb. 28, 2020. *LU2020_01: Data Request from the Continuous Distribution Workgroup of the OPTN Thoracic Committee*.

[58] Snyder et al, Figure 1.

Other Attributes Considered

The Committee discussed multiple potential attributes related to placement efficiency, including:

- Reduce the time between match run and final offer acceptance
- Candidate and hospital density
- Aura placement
- Reduce surgeon unavailability and donor hospital delays by encouraging more local recovery
- Use of OPTN tools that add to placement system efficiency

Reduce the time between match run and final offer acceptance

The likelihood of acceptance is another aspect of placement efficiency. The concept is that if an OPO can place an organ quicker, then the placement system is more efficient. There are different approaches to design this attribute:

> ***National acceptance practices*:** The OPTN collects information on acceptance practices. These could be analyzed to discover national acceptance patterns. These patterns could then be used to prioritize offers that are more likely to be accepted. The SRTR acceptance model used for simulating allocation policies provide some examples that could be included here.[59]
>
> ***Member specific acceptance practices*:** The OPTN collects information regarding member specific acceptance practices. These could be analyzed to determine member specific acceptance patterns. These patterns could then be used to prioritize members that are more likely to accept donor lungs matching certain criteria. An example of the use of past acceptances to determine future offer priority is in policy is Policy 11.6 *Facilitated Pancreas Allocation*.
>
> ***Candidate specific criteria*:** Another theory is that a candidate with a low LAS might be more willing to accept a less than ideal lung offer because they understand their LAS will not be high enough to prioritize them for ideal lung offers. Transplant hospitals would have to indicate this through some sort of screening criteria.

After discussion, the Committee declined at this time to include the likelihood of acceptance as an attribute in the composite allocation score. The Committee's discussion focused on two concerns. First, committee members expressed concern that the OPTN does not collect enough information to accurately predict the likelihood of acceptance. This is because acceptance patterns can differ between and within transplant hospitals, some accepting physicians consider clinical information that is not reported to the OPTN in a structured format, acceptance patterns can change over time, and we would not want to reinforce poor acceptance practices. Second, some committee members expressed concern about the OPTN limiting offers and physician's clinical decision making abilities. Additionally, lungs are typically offered and accepted within the first few offers which is different than organs such as kidney and livers; therefore, therefore, this approach might not amount to significant improvements in efficiency.[60]

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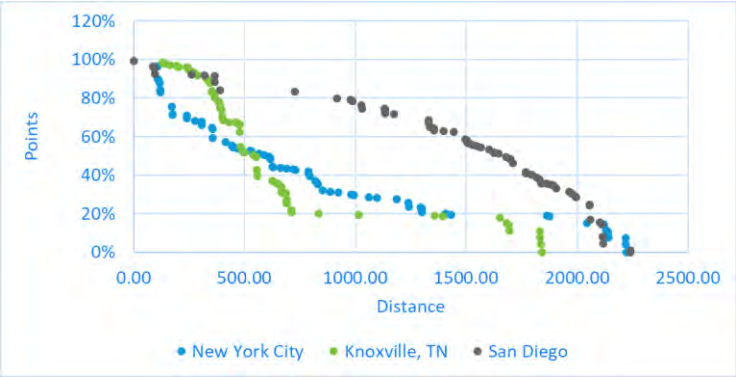
[59] https://www.srtr.org/reports-tools/offer-acceptance/

[60] Lehman, Rebecca. Jan. 16, 2019. *Monitoring of the Lung Allocation Change, 1 Year Report. Removal of DSA as a Unit of Allocation,* Figure 21. Available at https://optn.transplant.hrsa.gov/media/2815/20190116_thoracic_committee_report_lung.pdf.

Some members stated that in the long run, they did support "candidate specific criteria." However, this is likely too complex of an idea to pursue in the first iteration of continuous distribution, and there may not be enough data in UNet to support it for some time.

Candidate and Hospital Density

Another aspect of efficiency concerns the number of hospitals involved in the match at any given time. It takes less time for an OPO and transplant hospital to discuss the offer of one organ to five candidates at the same hospital than it does for an OPO to have similar conversation with five different hospitals. An efficient system would limit the number of hospitals with whom an OPO needs to interact at any given time.



While some members have expressed interest in this as an attribute, the Committee declined to include this as an attribute. Concerns were raised that this could advantage candidates registered at a transplant hospital close proximity to other transplant hospitals (typically large urban areas). Concerns were also raised whether it would be better to model this using donor density which then raised questions concerning the use of actual vs. potential donors and whether this attribute was more focused on equity or efficiency. Ultimately, the Committee believed this is worth further research and possible inclusion in a future iteration of continuous distribution, but were not ready to include candidate density at this time.

Aura placement

Another concept discussed by the Committee was a composite score aura. The concept is also based upon the notion it is more efficient to make 10 offers to 10 candidates at one hospitals than 10 offers to 10 candidates at 10 different hospitals. In this situation, a center would be permitted to accept the organ for any candidate whose composite score fell within the prescribed "aura".

The Committee saw this concept as ripe for abuse by transplant candidates with "magnet candidates" and did not endorse this approach. Furthermore, this approach strayed from the OPTN's long held approach that organs are allocated to candidates and not transplant programs.

Hypothetical match run under CD

Aura (cushion) = 0.2

Composite allocation score	Candidate	Center
5.45	1	A
5.40	2	B
5.35	3	A
5.33	4	A
5.30	5	B
3.90	6	A
3.50	7	B
3.25	8	C
3.00	9	C
2.96	10	A

Center A would be allowed to consider the organ for candidates #1, 3 & 4

If Center B became primary, it would be allowed to consider the organ for candidates #2 & 5

Reduce surgeon unavailability and donor hospital delays by encouraging more local recovery

Another aspect of efficiency concerns who recovers the organs. In most thoracic procurements, a recovery team travels from the accepting transplant hospital to the donor location then back to the transplant hospital. Other countries have found that it is more efficient for a recovery team closer to the

donor location to procure the organs then ship the organs to the transplant hospital.[61] Bonus points could be given to candidates willing to accept a locally recovered organ. This could happen in a couple different ways and would require monitoring to combat late turndowns and reallocations after the organ is transported.

While some members expressed interest in this as an attribute, the Committee declined to include this as an attribute. Concerns were raised concerned the availability of local procurement teams for lung transplantation. This attribute would be more meaningful if there already existed a broad system of local, lung procurement teams; right now, it is too dispersed to be meaningful for all transplant programs. Concerns were also raised that a member could indicate that they were willing to accept the organ from a local procurement team but change their mind once they had accepted the offer. There is also a lack of data regarding the level of efficiency gained by a local procurement team in the United States.[62] Ultimately, the Committee believed this is worth further research and possible inclusion in a future iteration of continuous distribution, but were not ready to include this attribute now. It is worth noting that the Policy Oversight Committee currently has a workgroup that is exploring how to increase the use of and efficiency of local procurement teams.

Use of OPTN tools that add to placement system efficiency

Another way in which to consider placement management efficiency is the "use of screening tools." The theory is that screening tools are similar to unacceptable antigens. If a member submits unacceptable antigens, it makes it harder for the candidate to receive a matching offer but makes the system more efficient. In exchange, sensitized candidates receive priority through CPRA points. Similarly, if a candidate has strict screening criteria, it will make it harder for the candidate to receive a matching offer and makes the placement system more efficient. For this, they could be awarded points. While the OPTN encourages members to use reasonable screening criteria, this approach could be concerning if it encouraged members to use screening criteria to not accept marginal donor organs. Additionally, the OPTN would likely need to improve the granularity and available options for screening tools available to members before this could be implemented. For these reasons, the Committee generally did not favor the addition of this attribute.

Ethical Analysis

All of the attributes outlined above align with ethical principles of equity or utility. These principles have been expressed consistently in NOTA, the 1986 Taskforce on Transplantation, and the OPTN Ethical Principles in the Allocation of Human Organs.[63] While these documents express a need to consider and balance both equity and utility, they do not call for an exact 50/50 balance between these two ethical principles.

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[61] Natl. Health. Services. 2019. *Annual Report on the National Organ Retrieval Service*, available at https://nhsbtdbe.blob.core.windows.net/umbraco-assets-corp/17072/annual-report-on-the-national-organ-retrieval-service-201819.pdf. Matesanz R, Miranda B, Felipe C.. 1994. *Organ procurement in Spain: impact of transplant coordination*. Clin Transplant. 8(3 Pt 1):281-286.

[62] While there is evidence about the efficiency of local recovery teams in the United Kingdom and Spain, those are national systems that are not the same as the dispersed procurement system in the United States.

[63] 42 USC Sec. 273, National Organ Transplant Act. U.S. Dept. of Health & Human Services. 1986. *Organ Transplanttion: Issues and Recommendations: Report of the Task Force on Organ Donation*. OPTN. 2015. *Ethical Principles in the Allocation of Human Organs*. Note: Equity is sometimes referred to as justice in these sources.

Continuous distribution serves as a vehicle to *not* to reargue well settled principles and requirements but rather to explore how the OPTN meets these requirements. Several years ago, Veatch and Ross foresaw the values of a composite allocation score as a method to balance our ethical goals.

> There is another strategy for integrating utility and justice that more plausibly would give them equal weight. We could standardize measures of expected medical benefit to that the candidate would the most expected benefit would get a full or maximum number of points for medical benefit. Then all the other candidates would be assigned lesser points in proportion to their expected medical benefit from the particular organ being allocated. Finally, we could standardize measures of medical need… with the most needy person receiving a maximum number of "justice points" and others who are less needy receiving lesser numbers of points in proportion. … The points of each type would then need to be allocated based on empirical evidence of how various factors are related to their target.[64]

Key features of allocation are not clinical decisions but rather are values laden questions. At its simplest level, we seek to balance equity and utility in the system. Many of the most essential and controversial allocation policy decisions are those that are values laden questions. For example, "the real issue in the debate over a local or national allocation are moral. … [D]eciding whether to trade off efficiency to make the allocation more fair is fundamentally not a technical medical questions. It is a question of the relative moral priority of efficiency and equity."[65]

Organ allocation requires the balancing of multiple goals. The field of operations research provides many tools for evaluating what are known as multi-criteria decisions. Because patients are just as capable of making values laden judgments and are ultimately impacted by these decisions,[66] the OPTN sought an approach that will allow patients to participate in this process. After much discussion and analysis, the Committee settled on a hybrid approach of different multi-criteria decision making (MCDM) methodologies to develop this project. Community feedback is most useful on the values laden decisions therefore the Committee is utilizing an Analytical Hierarchy Process (AHP) for its strengths in collecting feedback from a broad and diverse community. This has shown great promise for solving complex ethical problems[67] and including patients in clinical decision making. [68]

Policy Development Approach

As described in the August 2018 concept paper, the development of the composite allocation score requires the Committee to both 1) prioritize attributes against each other and 2) assign points to candidates within each attribute. The process to assign points within an attribute uses clinical and operational data to construct a ratings scale for each attribute. More information about each attribute is included above.

The approach to prioritize or weigh the attributes against each other is depicted in **Figure 11**. We can not use solely clinical or operational information to choose the relative weights of these attributes, as

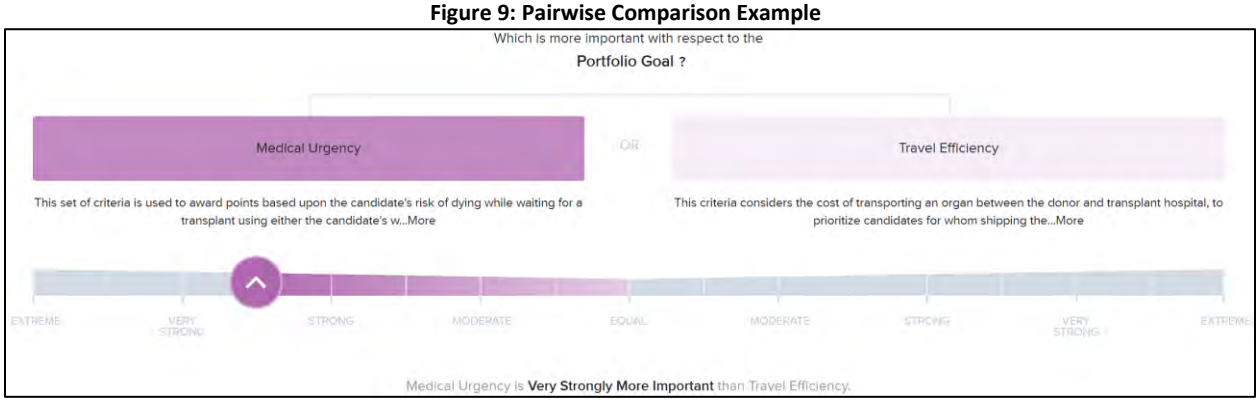
[64] Veatch & Ross, *Transplantation Ethics*, p. 302.
[65] Veatch & Ross, *Transplantation Ethics*, pp 377-378
[66] Veatch & Ross, *Transplantation Ethics*, pp 271-282.
[67] Millet, Ido. 1998 *Ethical Decision Making Using the Analytic Hierarchy Process*. Journal of Business Ethics. 17(11):1197-1204.
[68] Dolan, James. 2010. *Multi-criteria decision support: A primer on the use of multiple criteria decision making methods to promote evidence-based, patient-centered healthcare*.

these decisions also require making value judgments and ensuring compliance with laws and regulations. For this reason, it will benefit from a different analytical approach.

To begin, the OPTN is building a baseline of the current allocation policies in points.[69] The OPTN has years worth of prior decisions (in the form of match run data) that can be analyzed to estimate the community's priorities in how to allocate organs.[70] This is helpful for three reasons: 1) it shows the capability to allocate organs equitably and efficiently using a points based approach; 2) it provides a baseline to compare future iterations of a composite allocation score; and 3) it provides a potential backup policy in case the community is deadlocked about moving forward with the more ambitious composite allocation score.

We then are collecting feedback from the community regarding the community's priorities.[71] The Committee seeks input from a diverse cross-section of the transplant community. The prioritization exercise will show each participant a pair of attributes that will be used to prioritize candidates. (For example **Figure 9** shows medical urgency and travel efficiency.) Participants will then be asked 1) which attribute is more important and *how much* more important is that attribute. Participants are also encouraged to leave comments to explain their rationale as this information is very helpful to the Committee.

Figure 9: Pairwise Comparison Example

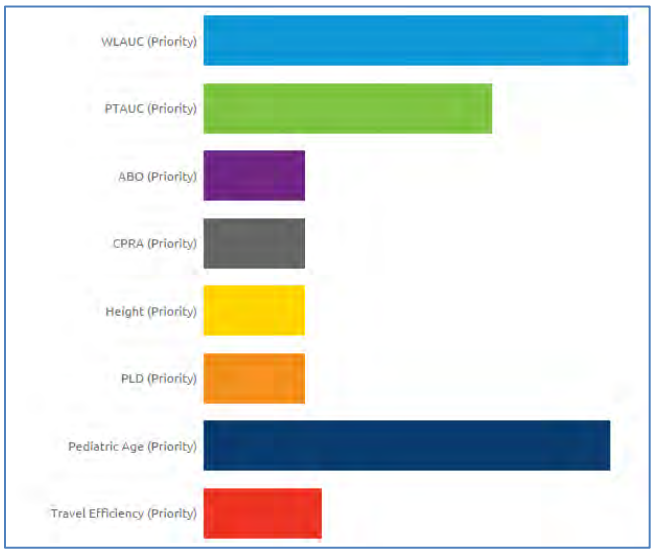


[69] The OPTN is using what is referred to as a revealed preference analysis, which is a cousin to discrete choice ("stated preferences") experiments. *See generally* Howard, Kirsten. et. al. 2016. *Preferences for Policy Options for Deceased Organ Donations for Transplantation: A Discrete Choice Experiment.* Transplantation.

[70] *See generally* Mark, T. L., & Swait, J., 2004. *Using stated preference and revealed preference modeling to evaluate prescribing decisions*. Health economics.

[71] This is also referred to as an Analytic Hierarchy Process (AHP). *See generally*, Lin, Carol and Harris, Shannon 2013. *A Unified Framework for the Prioritization of Organ Transplant Patients: Analytic Hierarchy Process, Sensitivity, and Multifactor Robustness Study*. Journal of Multi-Criteria Decision Analysis.

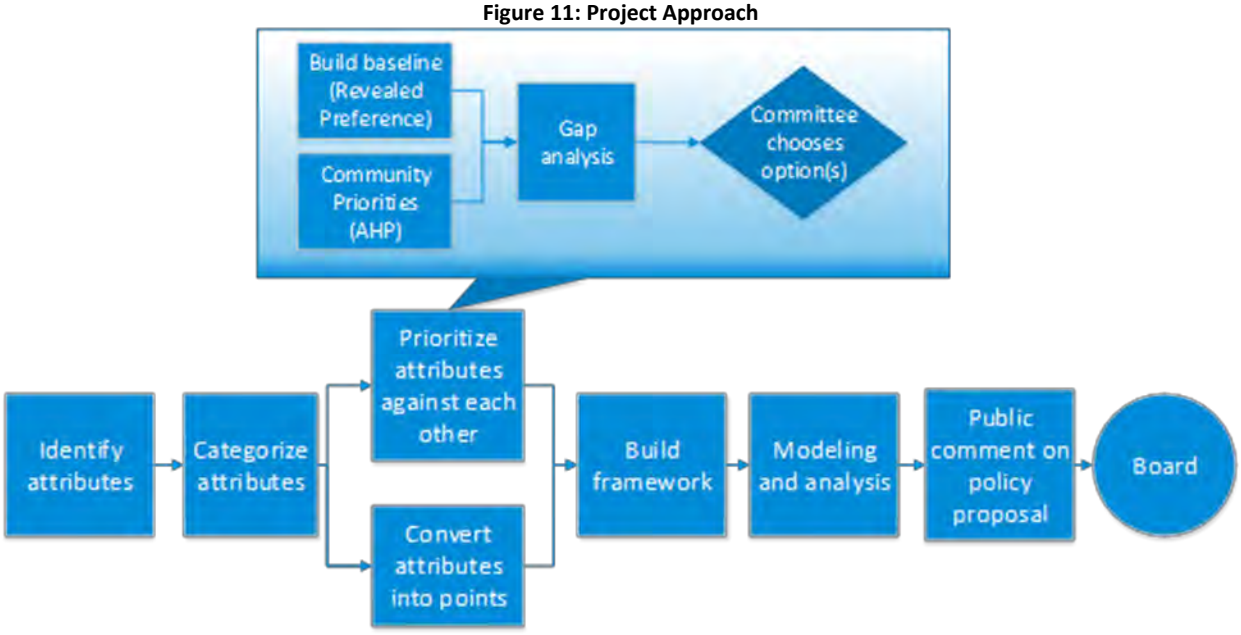
Figure 10: Hypothetical Attribute Weights



At the conclusion of the exercise, participants will be able to see their personal priorities for these attributes. (For example, see **Figure 10**.) The Committee will then review the overall priorities by specific attributes or demographics in order to better understand the community's preferences. If you wish to participate in the exercise to prioritize the attributes, please click here.

The Committee will then perform a gap analysis before choosing alternatives for SRTR modeling. This begins by building a baseline of the current policies in a points based fashion.[72] The Committee will review and discuss the differences between the baseline of current policies and the community's expressed priorities, along with a comparison against the OPTN's obligations in NOTA and the OPTN Final Rule, to develop a modeling request for the SRTR. The Committee will look for agreement across all of those resources and explore the reasoning for minority or different opinion. After reviewing those results and refining the relative weights of the attributes in the composite allocation score, the Committee will submit a modeling request to the SRTR. The Committee will *not* be bound to the majority perspective of the prioritization exercise; for the Committee *must* put forward a proposal that meets our statutory and regulatory requirements. The Committee will review the results of that modeling prior to releasing a policy proposal for public comment.

Figure 11: Project Approach

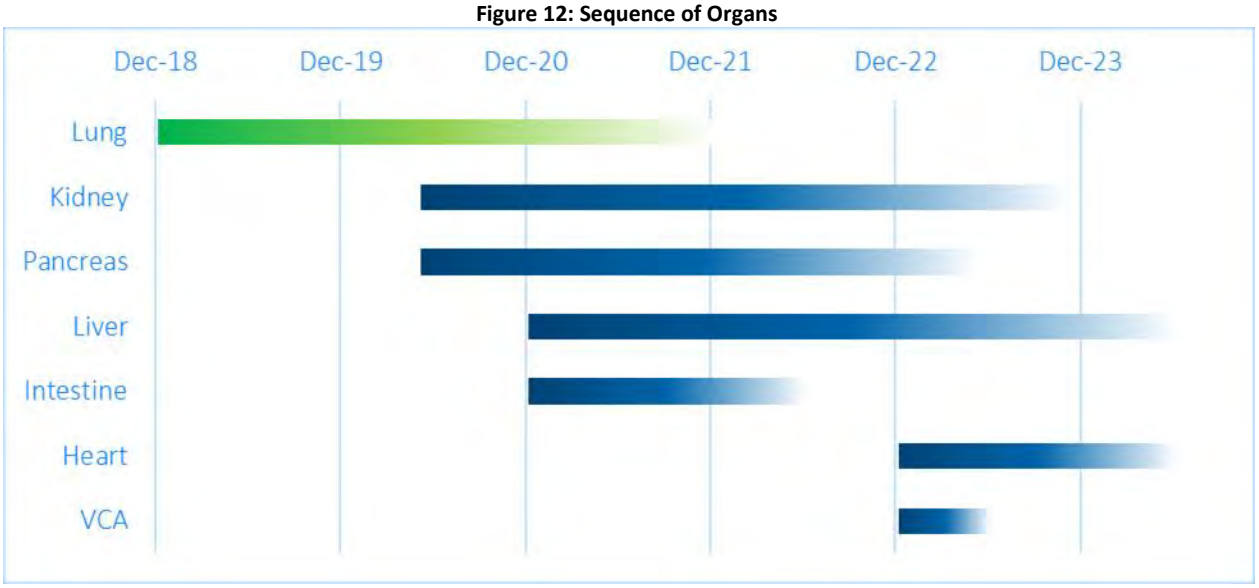


[72] This is referred to as "revealed preference" in **Figure 11**. For more information, *see* Swait, J. 2004. *Using stated preference and revealed preference modeling to evaluate prescribing decisions* Health Economics 13:563-573 https://doi: 10.1002/hec.845.

While this project will finish with a new method for allocating organs, it also represents new approaches for developing organ allocation policies. The policy development approaches have proceeded deliberately so that they can be replicated with other organ systems. For example, the discussions about how to award points to remove disadvantages based in candidate biology can be replicated for other organ systems or other biological disadvantages. The specific clinical outcomes from the lung project will not be binding upon other organs, but the methods will provide a structure to convert other organ systems to continuous distribution. In this way, this project will create efficiencies in future policy development efforts.

The Policy Oversight Committee discussed and agreed upon a sequencing for all of the organ systems to convert to continuous distribution. While lung continues their work, the OPTN has started work to convert kidney and pancreas. Liver and intestine will follow next. And last will be heart and VCA.

Figure 12: Sequence of Organs



NOTA and Final Rule Analysis

Organ allocation policies are governed by NOTA and the OPTN Final Rule.[73] These laws set requirements for allocation polices developed by the OPTN, including: sound medical judgement, best use of organs, avoiding wasting organs, promoting patient access to transplant, avoiding futile transplants, and promoting the efficiency of the organ placement system. The Final Rule also stipulates that allocation policies "shall not be based on the candidate's place of residence or place of listing, except to the extent required" by the other requirements of Section 121.8 of the Final Rule. Finally, the Final Rule includes a performance goal for allocation policies of "Distributing organs over as broad a geographic area as feasible under paragraphs (a)(1)-(5) of this section, and in order of decreasing medical urgency."

A critical objective of the Final Rule is to achieve the most equitable and medically effective use of donated human organs.[74] Towards that goal, the Final Rule directs the OPTN to overcome, as much as possible, arbitrary geographic barriers that restrict the allocation of organs to patients with the greatest medical urgency.[75] The proposed concept will allow a much more transparent nexus between any

[73] 42 U.S.C. Sec. 273 and 42 C.F.R. Sec. 121.8.
[74] 64 Fed. Reg. 56,650, October 20, 1999.
[75] 64 Fed. Reg. 56,651, October 20, 1999.

adopted policy and the legal requirements in the OPTN Final Rule. For example, the current system cannot easily express how each attribute aligns with the Final Rule or how important each factor is compared to one another. Whereas, continuous distribution's structure keeps these issues front and center. These requirements include the allocation policies:

- **Be based on sound medical judgment:** The construction of the individual ratings scales will be based on objective clinical and operations evidence. Because each attribute will have its own ratings scale, it will be easier to update the ratings scales as medical practice changes. It will also allow us to more easily identify clinical differences and similarities between organs.
- **Seek to achieve the best use of donated organs:** One of the best uses of a donated organ is that it is transplanted according to medical urgency; therefore one of the attributes will concern each candidate's waitlist mortality. Additionally, this clause of the OPTN Final Rule will be considered as the Committee prioritizes the weight of that attribute. Finally, before the policy proposal is released for public comment, it will be modeled by the SRTR to assess its impact on waitlist mortality and post-transplant outcomes. If necessary, the Committee will be able to adjust the weighting of the attributes to balance these outcomes.
- **Be designed to avoid wasting organs:** At this time, the proposed composite allocation score does not contain any attributes specifically designed to avoid wasting organs. The Committee has discussed attributes, such as the likelihood of organ offer acceptance, that would also have a positive effect on this Final Rule requirement. Additionally, before the policy proposal is released for public comment, it will be modeled by the SRTR to assess its impact on the total number of transplants. If necessary, the Committee will be able to adjust the weighting of the attributes to balance the number of transplants against other attributes.
- **Be designed to…promote patient access to transplantation:** The Committee included several attributes in the proposed composite allocation score specifically to address this clause. This includes the three attributes under the goal of candidate biology (highly sensitized, candidate blood type, and candidate height) and the two attributes under patient access (candidate age and prior living donors). The inclusion of these attributes will increase access to transplantation for these patients.
- **Be designed to…promote the efficient management of organ placement:** The Committee will consider travel costs and proximity between the donor and transplant hospitals as indicators of the efficient management of organ placement. Travel costs have a more direct impact on the efficiency of the organ placement system than the current geographic zones. Furthermore, the Committee will weigh this attribute only as much as necessary so that organs are distributed as broadly as feasible. The committee is continuing to discuss other attributes related to placement efficiency and requests feedback on other potential attributes related to the efficient management of organ placement.
- **Not be based on the candidate's place of residence or place of listing, except to the extent required [by the aforementioned criteria]:** The requirement to distribute over a broad geographic area reflects professional consensus that organs are a national resource meant to be allocated based on patients' medical need.[76] Specifically, the 1986 Task Force stated that: "The principle that donated cadaveric organs are a national resource implies that, in principle, and to the extent technically and practically achievable, any citizen or resident of the United States in need of a transplant should be considered as a potential recipient of each retrieved organ on a

[76] 42 C.F.R. §121.8(b)(3)

basis equal to that of a patient who lives in the area where the organs or tissues are retrieved. Organs and tissues ought to be distributed on the basis of objective priority criteria, and not on the basis of accidents of geography."[77] The Institute of Medicine made this same conclusion in 1999[78] and so did the American Medical Association in 2012.[79] The two attributes related to efficiency are the only attributes related to the candidate's place of registration. The Committee will weight these attributes only as much as is necessary.

- **Consider whether to adopt transition procedures:** A points-based framework will facilitate the use of transition procedures for existing candidates. For example, we will be able to compare the policy proposal with the results of the revealed preference analysis to determine who is impacted and if there is a need for transition procedures. This would allow members and patients time to prepare for these changes.

Conclusion

This project serves as an opportunity to redefine how the OPTN allocates organs and addresses long standing inequities and inefficiencies in the system. It also represents an opportunity to rethink how the OPTN and the transplant community develops organ allocation policies. This paper explains the work that the Lung Committee has performed to date and how it will move forward to a policy proposal. It also demonstrates a framework that can be replicated for other organs while continuing to tailor it for the specific clinical needs of that organ.

Community Feedback

- Is there anything else that the OPTN can do to better help you understand how this proposal is being developed?
- Do you agree with the Committee's recommended attributes?
- Are there any additional attributes related to placement efficiency that you can recommend?
- If you wish to participate in the AHP exercise to prioritize the attributes, please click here. This will bring you to a registration form. After you register your email address, you will receive an email from admin@decisionlens.com with instructions regarding the prioritization exercise. If you do not have internet access and wish to participate in the prioritization exercise, please call 1-844-395-4428.

[77] U.S. Dept. of Health & Human Services, Public Health Service, Health Resources and Services Administration, Office of Organ Transplantation, 1987. *Organ Transplantation: Issues and Recommendations: Report of the Task Force on Organ Transplantation*. Rockville, MD., p. 91, 1987, quoting Hunsicker, LG

[78] National Academies Press. 1999. *Organ Procurement and Transplantation*.

[79] American Medical Association. 2012. *Opinion 2.16 – Organ Transplantation Guidelines*. AMA Journal of Ethics 14(3) pp. 204-214, available at *https://journalofethics.ama-assn.org/article/ama-code-medical-ethics-opinions-organ-transplantation/2012-03*.

Appendix: Glossary of Terms:

The following terms are used throughout the concept paper.

Attribute

Attributes are criteria we use to classify then sort and prioritize candidates. For example, in lung allocation, our criteria include medical urgency, travel mode, ischemic time, blood type compatibility, and others.

Classification-based framework

A classification-based framework groups similar candidates into classifications or groupings. We then sort candidates within those classifications. A candidate will only appear in the classification that is most beneficial to them. This is the framework currently used to allocate organs.

Cliff

Cliffs are an illustrative term to describe hard boundaries in the attributes used to prioritize candidates. For example, the zones used in concentric circles have hard boundaries at specific distances. Continuous distribution and the move to a points-based framework aim to smooth these hard boundaries.

Composite Allocation Score

A composite allocation score combines points from multiple attributes together. This concept paper proposes the use of composite allocation scores in a points-based framework.

Concentric Circles

This distribution framework utilizes the distance between the donor hospital and the candidate's transplant hospital to prioritize organ offers to candidates. These distances are grouped into zones at specific nautical mile distances. This introduces a hard boundary in how candidates are prioritized. Thoracic organs were the first organs to be allocated using concentric circles.

Continuous Distribution

Continuous distribution was the phrase used in the 2018 Snyder article and by the Ad Hoc Geography Committee to describe a new framework for organ distribution. It utilizes points to prioritize candidates for organ transplant.

Distance

The distance between the donor hospital and transplant hospital is either the straight line or travel distance. Straight line distance is the current method for calculating distance and represents the shortest two points. Travel distance is the most likely distance that the organ would travel between two points. For example, a straight line distance would be the shortest distance between hospitals on either side of a body of water; whereas, the travel distance would be the distance that somebody might drive on the roads and bridges around the body of water.

Framework

A collection of policies and procedures used to distribute organs. Examples include concentric circles and continuous distribution.

Ischemic Time

Ischemic time is broken into three subparts: procurement, transit, and transplant time. Procurement time begins at cross-clamp and ends at transit departure time. OPO and procurement practices, among other things, influence procurement related ischemic time. Transit time is the time in between departure

from the procurement location and delivery at the transplant hospital. Transplant time is then the time between delivery at the transplant hospital and the start of anastomosis.

Points-based framework

A points-based framework gives each candidate a score or points. Organs are then offered in descending order based upon the candidate's score. This concept paper proposes a points-based framework for organ allocation.

Rating Scale

A rating scale describes how much preference is provided to candidates within each attribute. For example, if all else is equal, should a candidate with an LAS 80 receive twice as much priority as a candidate with an LAS 40? Applying the rating scale to each candidate's information and combining it with the weight of the attribute results in an overall composite score for prioritizing candidates.

Revealed Preference

A revealed preference analysis looks at actual decisions to determine the implicit preferences of the decision maker. This is compared with a stated preference analysis (for example, AHP or DCE) that asks the decision maker to state their preferences in an experiment.

Stated Preference

A stated preference analysis asks participants to state their preferences in a pairwise comparison. AHP and DCE are examples of stated preference analysis.

Weight

Weights are the relative importance or priority of each attribute toward our overall goal of organ allocation. For example, should waitlist mortality be more or less important than post-transplant outcomes? Combined with the ratings scale and each candidate's information, this results in an overall composite score for prioritizing candidates.

OPTN

Public Comment Proposal

Further Enhancements to the National Liver Review Board

OPTN Liver and Intestinal Organ Transplantation Committee

Prepared by: Matt Cafarella
UNOS Policy and Community Relations Department

Contents

Further Enhancements to the National Liver Review Board

Affected Policies:	*Policy 9.5.G: Requirements for Portopulmonary Hypertension MELD or PELD Score Exceptions* *Policy 9.5.I.i Initial Assessment and Requirements for HCC Exception Requests*
Affected Guidelines:	*National Liver Review Board Operational Guidelines*
Affected Guidance:	*Guidance to Liver Transplant Programs and the National Liver Review Board for Adult MELD Exception Review*
Sponsoring Committee:	*Liver and Intestinal Organ Transplantation*
Public Comment Period:	*August 4, 2020 – October 1, 2020*

Executive Summary

The purpose of the National Liver Review Board (NLRB), which was implemented on May 14, 2019, is to provide equitable access to transplant for liver candidates whose calculated model for end-stage liver disease (MELD) score or pediatric end-stage liver disease (PELD) score does not accurately reflect the candidate's medical urgency.[1] Since implementation, the OPTN Liver and Intestinal Organ Transplantation Committee (the Committee) has regularly evaluated the NLRB to identify opportunities for improvement. The first round of enhancements to the NLRB was approved by the OPTN Board of Directors (the Board) on June 8, 2020.[2] This proposal represents the second round of enhancements based on further experience with the NLRB.

This proposal seeks to make the following enhancements to the NLRB policy, operational guidelines, and guidance documents in order to make the system more efficient and equitable.

- **Policy:** The proposed changes to policy include updating the criteria for a standardized MELD or PELD exception for portopulmonary hypertension (POPH) to match updated clinical guidelines and creating a more effective process for reviewing *Post-Transplant Explant Pathology* forms for candidates with hepatocellular carcinoma (HCC). Changes to data collection are required to operationalize the updates for the POPH criteria.
- **Operational Guidelines:** The improvements to the operational guidelines include creating a separate Appeals Review Team (ART) specifically for pediatric cases and adding a member of the Committee to each ART.
- **Guidance:** The Committee intends to update the guidance for polycystic liver disease (PLD) to clarify the MELD score recommendation, provide guidance for candidates also requiring a kidney, and add new comorbidities that should be considered for a MELD exception.

The Committee is seeking public feedback on the proposed changes listed above as well as any other aspects of the NLRB.

[1] *Proposal to Establish a National Liver Review Board*, OPTN Liver and Intestinal Organ Transplantation Committee, June 2017, Available at https://optn.transplant.hrsa.gov/
[2] *Enhancements to the National Liver Review Board*, OPTN Liver and Intestinal Organ Transplantation Committee, June 2020, Available at https://optn.transplant.hrsa.gov/

Background

When being listed for a liver transplant, candidates receive a calculated MELD or PELD score, which is based on a combination of the candidate's clinical lab values.[3] These scores are designed to reflect the probability of death on the waitlist within a 3-month period, with higher scores indicating a higher probability of mortality and increased urgency for transplant. Candidates who are less than 12 years old receive a PELD score, while candidates who are at least 12 years old receive a MELD score. Candidates that are particularly urgent are assigned a priority 1A or 1B status.

When a transplant program believes that a candidate's calculated MELD or PELD score does not accurately reflect a candidate's medical urgency, they may request a score exception. The NLRB is responsible for reviewing exception requests and either approving or denying the requested score.

The NLRB was approved by the OPTN Board of Directors (the Board) at their June 2017 meeting and was implemented on May 14, 2019.[4] The NLRB was designed to create an efficient and equitable system for reviewing exception requests for candidates across the country.

Since it was implemented, the Committee has regularly evaluated the NLRB to identify opportunities for improvement. In fact, the improvements included in this proposal represent the second round of changes to the NLRB. Prior changes were included in the *Enhancements to the NLRB* proposal that was approved by the Board in June 2020.[5]

Purpose

Since the implementation of the NLRB, the Committee has carefully evaluated the effectiveness of the system. The Committee has identified a number of ways in which the NLRB could be improved through updates to the NLRB policy, operational guidelines, and guidance documents. The purpose of this proposal is to build upon previous enhancements and continue to improve the NLRB by incorporating feedback from the transplant community. The proposed changes are anticipated to create a more efficient and equitable system for the review of exception requests.

The enhancements included in this proposal involve changes to OPTN policy language, the operational guidelines, and the guidance documents. The operational guidelines outline the function and operation of the NLRB, including who may participate as an NLRB reviewer, the responsibilities of NLRB reviewers, voting procedures, and the appeal process. The guidance documents are intended to provide guidance to review board members and transplant programs to help ensure consistent and equitable review of exception cases. The guidance documents are not OPTN policy and serve as a resource for reviewers and transplant programs. Each of the three specialty review boards (Pediatric, Adult Other Diagnosis, and Adult HCC) has a specific guidance document. The Committee is proposing changes to the guidance documents for the Adult Other Diagnosis specialty review board.

[3] The calculation for the MELD and PELD scores can be found in OPTN Policy, Available at https://optn.transplant.hrsa.gov/.
[4] *Proposal to Establish a National Liver Review Board*, OPTN Liver and Intestinal Organ Transplantation Committee, June 2017, Available at https://optn.transplant.hrsa.gov/
[5] *Enhancements to the National Liver Review Board*, OPTN Liver and Intestinal Organ Transplantation Committee, June 2020, Available at https://optn.transplant.hrsa.gov/

Overview of Proposal

OPTN Policy

The Committee is proposing two changes to OPTN policy language as part of this proposal. The Committee proposes to update the standardized criteria for initial exceptions and extensions of exceptions for candidates with portopulmonary hypertension (POPH) as outlined in *OPTN Policy 9.5.G: Requirements for Portopulmonary Hypertension MELD or PELD Score Exceptions* to provide more appropriate standardized exceptions and better meet current clinical guidelines. The Committee is also proposing changes to the process for reviewing *Post-Transplant Explant Pathology Form*s for candidates with hepatocellular carcinoma (HCC) to allow for more effective oversight of programs submitting HCC exceptions.

Updating Standardized Criteria for Portopulmonary Hypertension Exceptions

The initial criteria for MELD or PELD exceptions for candidates with portopulmonary hypertension (POPH) were developed in 2006 as a part of the MELD Exception Study Group and Conference (MESSAGE).[6] These criteria were formally adopted into OPTN policy in 2009.[7] Since that time, the criteria for candidates with POPH to be automatically approved for an exception have not substantially changed. The Committee intends to update the criteria for candidates to receive a standardized exception as more recent data and guidelines indicate that the current standardized criteria should be revised. The proposed criteria will ensure that the appropriate candidates are eligible for a standardized exception and reduce the work load of the Adult Other Diagnosis specialty board.

Since 2018, there have been 75 deceased donor transplant recipients with POPH. This represents 0.4% of all transplants in that time frame. The majority of transplant recipients with POPH are age 40-64 years (69.3%) and white (69.3%). The majority of these individuals had public insurance (64.4%). Since 2018, 90.1% of all exception forms for POPH have been approved. From the time that the NLRB was implemented, 85 (63.4%) exception forms for POPH met standard criteria and were automatically-approved. Conversely, 48 (35.8%) exception forms did not meet standard criteria and were reviewed by the NLRB and one (0.7%) form met standard criteria and was reviewed by the NLRB. There is not significant variation in the number of candidates with POPH on the liver waiting list between OPTN regions.[8]

In current policy, in order for a candidate to receive a standardized exception for POPH, the transplant program must submit an initial mean pulmonary arterial pressure (MPAP) and pulmonary vascular resistance (PVR). These values must be taken prior to the initiation of any treatment protocols. Transplant programs must also submit documentation that treatment was administered and that the MPAP and PVR values were improved after treatment. The post-treatment MPAP and PVR values must meet specific thresholds in order for the candidate to be eligible for a standardized exception. The Committee is proposing a number of changes related to the pre-treatment and post-treatment measurements and thresholds of MPAP and PVR.

[6] Michael J. Krowka et al., "Model for End-Stage Liver Disease (MELD) Exception for Portopulmonary Hypertension," *Liver Transplantation* 12, o. S3 (2006), https://doi.org/10.1002/lt.20975)
[7] OPTN/UNOS Liver and Intestinal Organ Transplantation Committee Report to the Board of Directors, June 2009
[8] OPTN Data accessed on June 16, 2020. Data includes all liver transplant recipients from deceased donors during January 1, 2018 through May 31, 2020; all liver waiting list registrations on the waiting list on June 12, 2020; and all liver MELD or PELD exception forms for POPH submitted during January 1, 2018 through May 31, 2020.

In the current criteria, there are no specific thresholds for the pre-treatment MPAP or PVR values. While the intent of the policy is to document an improvement from the pre-treatment to the post-treatment values, this is not currently required in the system, as any values can be entered for the pre-treatment measurements. To better document an improvement before and after administration of treatment, the Committee is proposing that candidates must have moderate to severe POPH, as defined by MPAP greater than 35 mmHg and a PVR greater than or equal to 240 dynes*sec/cm^5 prior to administration of any treatment, in order to be eligible for a standardized exception.[9] These criteria, although not explicit in previous policy, meet established clinical guidelines and should not reduce access to transplantation, as patients with less severe POPH are not considered to be candidates for liver transplantation.[10]

The Committee is also proposing changes to the post-treatment MPAP and PVR thresholds. In current policy, a candidate must have a post-treatment MPAP value less than 35 mmHg and a PVR value less than 400 dynes*sec/cm^5. The Committee is proposing additional criteria to also allow a candidate to be automatically approved for an exception if treatment results in an MPAP value between 35 mmHg and 45 mmHg with corresponding improvement of PVR to be less than 240 dynes*sec/cm^5. **Table 1** below summarizes the proposed changes to the post-treatment hemodynamic criteria:

Table 1: Post-treatment Hemodynamic Criteria

Current Post-Treatment Hemodynamic Criteria	Proposed Post-Treatment Hemodynamic Criteria
1. If MPAP is less than 35 mmHg then PVR must be less than 400 dynes*sec/cm^5	1. If MPAP is less than 35 mmHg then PVR must be less than 400 dynes*sec/cm^5 **OR** 2. If MPAP is greater than or equal to 35 and less than 45 mmHg then PVR must be less than 240 dynes*sec/cm^5

Published research suggests the need to update the post-treatment criteria to better capture the candidate population suitable for a standardized exception. MPAP is calculated by the following equation, which includes cardiac output (CO) and pulmonary artery wedge pressure (PAWP): *MPAP = CO x PVR + PAWP*. The current post-treatment criteria do not account for the different causes of an elevated MPAP, which include an increase in PVR associated with pulmonary vasoconstriction and vascular remodeling, as well as patients with a high CO or volume overload.[11] In addition, the current post-treatment threshold of 35 mmHg is based on a single-center observational study and literature review of 43 patients transplanted with POPH prior to 2000 and a multi-center database of 66 POPH patients, 26 of whom were transplanted prior to 2001. [12, 13]

Recent research describes positive post-transplant outcomes in patients with an MPAP greater than 35mmHg caused by an increase in CO and a normal PVR, which commonly occurs in patients who have

[9] Michael J. Krowka et al., "International Liver Transplant Society Practice Guidelines: Diagnosis and Management of Hepatopulmonary Syndrome and Portopulmonary Hypertension ," Transplantation 100, no. 7 (2016): pp. 1440-1452, https://doi.org/10.1097/tp.0000000000001229)
[10] Ibid.
[11] Ibid.
[12] Michael J. Krowka et al., "Pulmonary Hemodynamics and Perioperative Cardiopulmonary-Related Mortality in Patients With Portopulmonary Hypertension Undergoing Liver Transplantation," *Liver Transplantation* 6, no. 4 (2000): pp. 443-450, https://doi.org/10.1053/jlts.2000.6356)
[13] Michael J. Krowka et al., "Hepatopulmonary Syndrome and Portopulmonary Hypertension: A Report of the Multicenter Liver Transplant Database," *Liver Transplantation* 10, no. 2 (2004): pp. 174-182, https://doi.org/10.1002/lt.20016)

received treatment.[14, 15] However, no patient with a hyperdynamic circulatory state had an MPAP greater than 45 mmHg.[16] Additional research indicates that PVR, and not MPAP, is a strong predictor of waitlist mortality in transplant candidates with POPH.[17] Finally, only 5.4 percent of hepatologists and pulmonary hypertension physicians who responded to a recent survey felt that an MPAP greater than 35 mmHg should be considered as an absolute contraindication to liver transplantation.[18]

Based on the available evidence, the Committee is proposing an update to the post-treatment criteria to allow for a standardized exception when MPAP is less than 35 mmHg and PVR is less than 400 dynes*sec/cm^5, and also when MPAP is greater than or equal to 35 mmHg and less than 45 mmHg and PVR is less than 240 dynes*sec/cm^5.

The Committee is also proposing the addition of policy language indicating that the pre-treatment values must be from the same test date. This language already exists for the post-treatment criteria. The proposed language also includes the requirement that the values are obtained via right heart catheterization. This is intended to match the requirements for POPH exception extensions.

The Committee is proposing new policy language requiring transplant programs to indicate that other causes of pulmonary hypertension have been assessed and determined not to be a significant contributing factor to the clinical situation of the candidate. International Liver Transplant Society (ILTS) Practice Guidelines indicate that other causes of pulmonary hypertension may be present in the setting of liver disease and should not be considered as an indication for liver transplantation.[19] Requiring documentation that the candidate does not have another form of pulmonary hypertension will ensure that only those candidates with POPH, who may benefit from liver transplantation, are eligible for a standardized MELD or PELD exception.

This proposed change to policy involves new data collection. Transplant programs will need to indicate on the MELD or PELD exception form for POPH whether or not other causes of pulmonary hypertension have been assessed and determined to not be a significant contributing factor. More details on the proposed data collection can be found in the section titled, “New Data Collection” below.

The Committee is also proposing the addition of language requiring transplant programs to provide documentation of portal hypertension at the time of the initial exception for candidates to be automatically approved for a POPH exception. There is currently no minimum liver disease severity required for a candidate to receive a POPH exception. However, research indicates that severity of liver disease is an important predictive indicator for positive post-transplant outcomes.[20] Patients with less

[14] Erin S. DeMartino et al., “Frequency and Outcomes of Patients With Increased Mean Pulmonary Artery Pressure at the Time of Liver Transplantation,” *Transplantation* 101, no. 1 (2017): pp. 101-106, https://doi.org/10.1097/tp.0000000000001517)
[15] Corey J. Sadd et al., “Long-Term Outcomes and Survival in Moderate-Severe Portopulmonary Hypertension After Liver Transplant,” *Transplantation* Publish Ahead of Print (2020), https://doi.org/10.1097/tp.0000000000003248.
[16] Erin S. DeMartino et al., “Frequency and Outcomes of Patients With Increased Mean Pulmonary Artery Pressure at the Time of Liver Transplantation,” *Transplantation* 101, no. 1 (2017): pp. 101-106, https://doi.org/10.1097/tp.0000000000001517)
[17] Hilary M. Dubrock et al., “Predictors of Waitlist Mortality in Portopulmonary Hypertension,” *Transplantation* 101, no. 7 (2017): pp. 1609-1615, https://doi.org/10.1097/tp.0000000000001666)
[18] Hilary M. Dubrock et al., “Portopulmonary Hypertension: a Survey of Practice Patterns and Provider Attitudes,” *Transplantation Direct* 5, no. 6 (2019), https://doi.org/10.1097/txd.0000000000000900)
[19] Michael J. Krowka et al., “International Liver Transplant Society Practice Guidelines: Diagnosis and Management of Hepatopulmonary Syndrome and Portopulmonary Hypertension ,” Transplantation 100, no. 7 (2016): pp. 1440-1452, https://doi.org/10.1097/tp.0000000000001229.
[20] Maud Reymond et al., “Does Portopulmonary Hypertension Impede Liver Transplantation in Cirrhotic Patients? A French Multicentric Retrospective Study,” *Transplantation* 102, no. 4 (2018): pp. 616-622, https://doi.org/10.1097/tp.0000000000001981.

severe liver disease have low mortality and therefore should not be eligible to receive a standardized MELD or PELD exception for POPH.[21] Requiring transplant programs to provide documentation of portal hypertension will ensure that only candidates with significant liver disease automatically receive the additional priority.

This proposed change also involves additional data collection. Transplant programs will need to indicate on the exception form if documentation of portal hypertension at the time of the initial exception is available. More details on the proposed data collection can be found in the section titled, "New Data Collection" below.

In addition to the proposed changes to the criteria for an initial MELD or PELD exception, the Committee also intends to update the exception extension criteria. Currently, in order for a candidate with an approved POPH exception to automatically maintain the exception, the transplant program must provide evidence of a right heart catheterization since the previous exception or extension that confirms the MPAP remained less than 35 mmHg. The proposed language changes the extension criteria to match the post-treatment hemodynamic criteria for an initial exception. Instead of only requiring transplant programs to document that the MPAP remains less than 35 mmHg, the proposed language would require transplant programs to document that the candidate continues to meet the post-treatment MPAP and PVR criteria previously described for an initial exception. This change ensures that the candidates receiving a standardized extension are continuing to meet the necessary clinical indicators.

This change includes additional data collection. More details on the proposed data collection can be found in the section titled, "New Data Collection" below.

The Committee is seeking public comment feedback on the new criteria for standardized POPH exceptions, particularly if the proposed language will better represent the candidate population needing a standardized POPH exception. The Committee is also seeking feedback on if there should be a threshold in policy for the initial transpulmonary gradient to correct for volume overload.

HCC: Post-Transplant Explant Pathology Form Review

OPTN Policy 9.5.I.i: Initial Assessment and Requirements for HCC Exception Requests outlines the process for reviewing *Post-Transplant Explant Pathology Forms* for candidates with HCC. The purpose of the review process is to ensure that recipients that are transplanted with the additional priority afforded to HCC candidates had an accurate diagnosis of HCC. There may be cases where a transplant program incorrectly identifies a mass on a liver as HCC, and upon resection, realizes that the original mass was not HCC.

Under the process described in current policy, a transplant program is required to submit the explant pathology form to the OPTN within 60 days after a candidate is transplanted with an HCC exception. If the explant pathology form does not indicate evidence of HCC, then the transplant program must submit additional documentation or imaging studies confirming HCC at the time of transplantation to the OPTN. The Committee will then review a transplant program when 10 percent of cases within a one year period are not supported by the required pathologic documentation or other submitted clinical information.

[21] Ibid.

However, this process requires UNOS staff to interpret the additional documentation or imaging studies in order to know when the 10 percent threshold is met. UNOS staff do not have the clinical expertise to review such documentation. More so, the process requires transplant programs to submit additional documentation when the explant pathology form indicates no evidence of HCC, regardless of whether the candidate has received treatment of HCC. In many instances, there may be no evidence of HCC if the candidate has received treatment for HCC.

The Committee is proposing two changes to the process for reviewing explant pathology forms. The purpose for the changes is to ensure that the Committee has sufficient and appropriate oversight over transplantation of candidates with HCC so that no program is habitually transplanting candidates without evidence or treatment of HCC.

First, the updated policy language would require transplant programs to submit additional documentation only when the explant pathology form does not show evidence of HCC or treatment of HCC. This change reflects the fact that a liver recipient can have no evidence of HCC at the time of transplant due to previous treatment for HCC. Therefore, this change restricts the submission of additional documentation to only those cases where it is not evident that the candidate had HCC and better limits Committee review to those transplant programs that need additional oversight.[22]

The proposed changes to the policy will also remove the need for UNOS staff to interpret the submitted documentation or imaging studies. Under the proposed process, when an explant pathology form does not indicate evidence or treatment of HCC, the transplant program will still be required to submit additional documentation to the OPTN, but this documentation will only be reviewed by the Committee if 10 percent of explant pathology forms show no evidence or treatment of HCC in a one year period.

The Committee is requesting public comment feedback on the updated review process and if it provides sufficient opportunity for the Committee to review transplant programs that may be inappropriately utilizing the additional priority afforded to HCC candidates. The Committee is also seeking input on if the updated policy should state that the Committee has the ability to refer transplant programs to the Membership and Professional Standards Committee (MPSC).

Operational Guidelines

The Committee is proposing two changes to the *National Liver Review Board Operational Guidelines*. The operational guidelines outline how the NLRB functions and provides additional detail on the operation of the NLRB.[23]

Pediatric Appeals Review Team (ART)

Under the current appeal process, a transplant program can appeal a denied case, first to the same group of reviewers, then to the ART, and finally to the Committee. The current ART consists of nine NLRB members, who are assigned to participate on the ART for a one month term. Of the nine NLRB members on each ART, two are from the NLRB Pediatric specialty board. The ART reviews cases via teleconference at a set day and time each week. Representatives from the petitioning transplant

[22] Since 2012, 20 transplant programs have had at least 10% of explant pathology forms in a one year period with no evidence of HCC and no treatment of HCC. However, in the same time period, 212 transplant programs have had at least 10% of explant pathology forms in a one year period with no evidence of HCC.
[23] Current operational guidelines are available at https://optn.transplant.hrsa.gov/

program have the ability to join the ART calls and present the case on behalf of the candidate. Five members of the ART must participate on each call and the appeal must achieve a majority plus one affirmative votes in order to be approved.

The Committee is proposing the creation of a pediatric-specific ART to review all cases appealed from the Pediatric specialty board. The pediatric ART would consist only of NLRB reviewers from the Pediatric specialty board, allowing for those individuals with more specific pediatric expertise to review the cases for pediatric candidates.[24]

The creation of a pediatric ART is in response to feedback from the transplant community and Committee members' own experience on the ART. Transplant programs presenting pediatric cases to the ART often felt that the ART, as currently constructed, did not have sufficient pediatric expertise to provide appropriate case review. Similarly, ART members without pediatric expertise frequently noted that they did not have sufficient expertise to review pediatric cases. The Committee feels that establishing a pediatric ART will better align the expertise of ART reviewers with the assigned cases and provide for more equitable case review.

The creation of a pediatric ART will create additional responsibility for NLRB reviewers, especially on the NLRB Pediatric specialty board. The current guidelines state that NLRB reviewers will serve no more than one month on the ART each year. However, due to the number of members on the Pediatric specialty board, these reviewers will need to serve for multiple months on the Pediatric ART. There are typically fewer ART appeals from the NLRB Pediatric specialty board, so while pediatric ART reviewers will serve longer terms, it is unlikely that they will be responsible for reviewing more cases. In approximately the first six months of the NLRB, there were 15 ART cases from the Pediatric specialty board out of 131 total ART cases. Based on this information, the pediatric ART should expect to review cases on a less frequent basis, although they will still have calls scheduled every week. The calls will be cancelled if there are no cases to review.

The Committee is seeking public feedback on the proposed creation of a pediatric ART and are particularly interested in feedback from individuals who participate on the Pediatric specialty board.

ART Leader

In addition to creating a Pediatric ART, the Committee is also proposing the addition of an ART leader. Throughout the first year of the NLRB, the Liver Committee has found it difficult to evaluate the ART due to the nature of the ART calls. Unlike reviews conducted electronically, ART reviewers provide feedback on cases via teleconference and such feedback is often difficult to evaluate. Votes and comments from reviewers are documented by UNOS staff but this documentation does not provide detail on the conversation during the call. Committee members who served on the ART also felt that the calls would benefit from having an individual designated to help lead the calls and facilitate discussion.

To address these concerns, the Committee is proposing adding a Committee member to each ART. The Committee also expects these Committee members to help guide and facilitate discussion on the ART calls. The intent of the Committee is to allow for more visibility into the ART review process and help guide the conversation to provide efficient case review and constructive feedback.

[24] Under the current system, if a pediatric candidate has HCC, the case is reviewed by the Pediatric specialty board. To maintain a consistent process, these cases would be reviewed by the pediatric ART as well.

The plan is to assign one Committee member who serves as an NLRB reviewer to be the ART leader for each month. The ART leader will be a voting member of the ART. The Committee does not intend to have an ART leader for the pediatric ART, as there are not enough Committee members with pediatric experience to serve in the role for each ART.

There is nothing in the current guidelines explicitly prohibiting the addition of a Committee member to each ART, so the proposed changes to the guidelines in this regard are minimal. The Committee is seeking public feedback on the concept of an ART leader and the responsibilities of that individual. The Committee is also seeking public input on adding an ART leader to the pediatric ART and who those individuals should be, given the constitution of the Committee.

Guidance Documents

Each of the three specialty review boards (Pediatric, Adult Other Diagnosis, and Adult HCC) has specific, clinical guidance to assist reviewers in evaluating exception requests for the corresponding candidate population. The guidance documents are intended to provide guidance to transplant programs when submitting exception cases and to review board members when reviewing exception cases. The guidance documents help ensure that cases contain the necessary clinical information and that they are reviewed consistently and equitably. The Committee is proposing changes to the guidance for polycystic liver disease (PLD), which is in the guidance document for the Adult Other Diagnosis specialty review board.

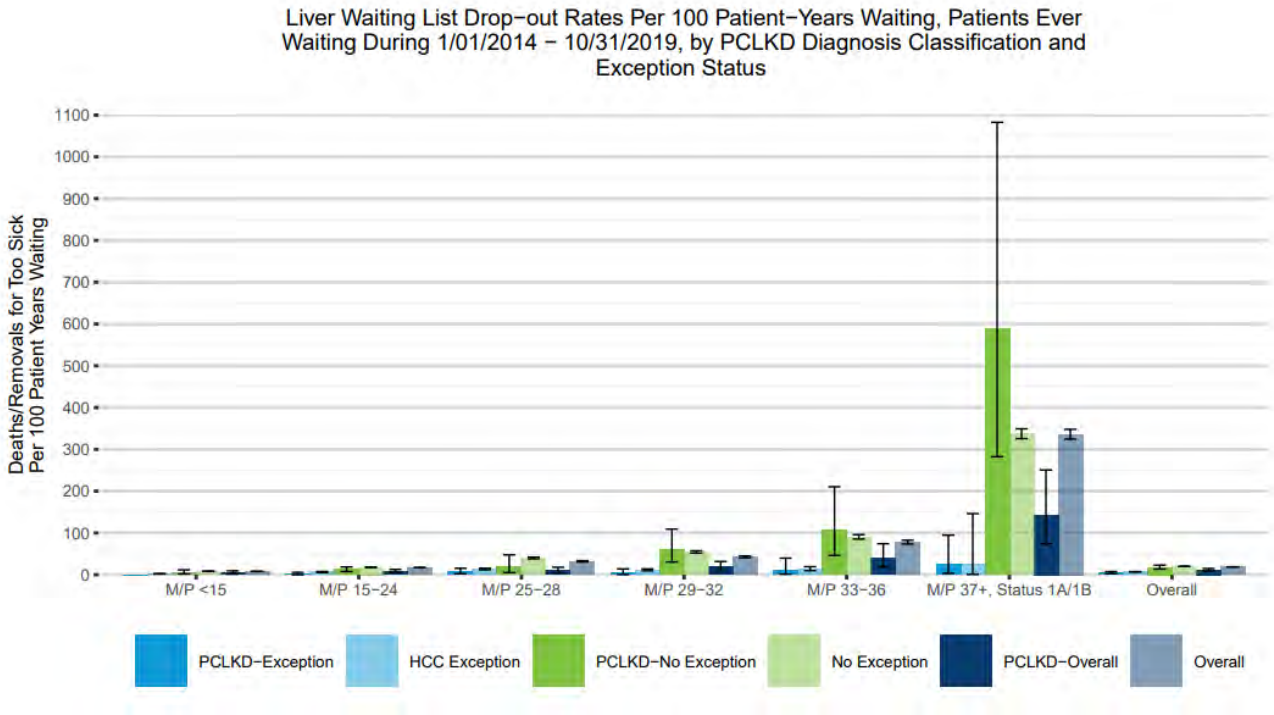
The current guidance for PLD states that candidates who meet the provided criteria should be considered for a MELD exception such that transplantation is expected within the year. It is difficult for transplant programs to know what exception score to request so that transplantation is expected within the year. More so, reviewers are unable to know if the score requested will allow the candidate to be transplanted within the year, as they do not know any identifying information about the candidate, including the location of the transplant program at which they are registered. This score recommendation has caused confusion for both transplant programs and reviewers. Therefore the Committee intends to change the score recommendation to be more in line with other areas of guidance by recommending that candidates meeting the provided criteria should be considered for an exception score similar to other policy assigned scores. The Committee is seeking feedback if this is the best language to use for the score recommendation.

The Committee also intends to add guidance for candidates with PLD who require kidney transplantation. The additional guidance states that candidates meeting the criteria for a PLD exception who also meet the medical eligibility criteria for simultaneous liver-kidney allocation as described in *OPTN Policy 9.9: Liver-Kidney Allocation* and are registered on the kidney waitlist should be considered for a MELD exception similar to hyperoxaluria in OPTN policy. This score recommendation is higher than the score recommendation for candidates with PLD who do not require a kidney. The Committee decided to include a higher score recommendation for candidates also requiring a kidney for two reasons. First, the Committee felt that it was appropriate to provide the higher score recommendation to give these candidates a greater likelihood of receiving a liver and a kidney from the same donor. Such a donor would likely be considered high-quality and a high MELD score would be needed to receive an offer for a high-quality donor.[25] In addition, candidates with polycystic liver-kidney disease (PCLKD),

[25] See OPTN Liver and Intestinal Organ Transplantation Committee meeting summary, January 9, 2020. Available at

which are those candidates with PLD also requiring a kidney, who do not have an exception, have higher waiting list drop-out rates than candidates with similar MELD or PELD scores with an exception. This is specifically true for candidates with a MELD or PELD score higher than 29.[26]

Figure 1: PCLKD Wait List Drop Out



In addition, the Committee intends to update the list of comorbidities considered to be appropriate indications for a MELD exception. In the current guidance for PLD, it states that candidates with severe symptoms and either hepatic decompensation, concurrent hemodialysis, or GFR less than 20 ml/min should be considered for a MELD exception. The Committee is proposing that patients with a prior kidney transplant or with moderate to severe protein calorie malnutrition should also be considered for a MELD exception.

The Committee felt that the current guidance inadvertently penalized candidates who previously received a kidney transplant but not a liver graft. These candidates would not have a GFR less than 20 ml/min due to the kidney transplant and would not qualify given the current criteria. However, a candidate needing a kidney and a liver should not lose prioritization for the liver if they previously received only a kidney.[27] The Committee intends to include candidates who have moderate to severe

https://optn.transplant.hrsa.gov/

[26] OPTN Descriptive Data Request. "Polycystic Liver-Kidney Disease Patients" Prepared for the NLRB Subcommittee Meeting, January 9, 2020.

[27] See OPTN Liver and Intestinal Organ Transplantation Committee meeting summary, November 14, 2019. Available at https://optn.transplant.hrsa.gov/

protein calorie malnutrition in the list of comorbidities. Often, candidates with PLD have large livers, which restricts their ability to consume nutrition and increases their urgency for transplant.[28, 29]

The Committee is seeking public feedback regarding the updated guidance and proposed score recommendations.

NOTA and Final Rule Analysis

The Committee submits the proposed changes to liver allocation policy (*Policy 9.5.G: Requirements for Portopulmonary Hypertension MELD or PELD Score Exceptions*) for Board consideration under the authority of the OPTN Final Rule, which states "The OPTN Board of Directors shall be responsible for developing…policies for the equitable allocation for cadaveric organs."[30] The Final Rule requires that when developing policies for the equitable allocation of cadaveric organs, such policies must be developed "in accordance with §121.8," which requires that allocation policies "(1) Shall be based on sound medical judgment; (2) Shall seek to achieve the best use of donated organs; (3) Shall preserve the ability of a transplant program to decline an offer of an organ or not to use the organ for the potential recipient in accordance with §121.7(b)(4)(d) and (e); (4) Shall be specific for each organ type or combination of organ types to be transplanted into a transplant candidate; (5) Shall be designed to avoid wasting organs, to avoid futile transplants, to promote patient access to transplantation, and to promote the efficient management of organ placement;…(8) Shall not be based on the candidate's place of residence or place of listing, except to the extent required by paragraphs (a)(1)-(5) of this section." This proposal:

- **Is based on sound medical judgment**[31] because it is an evidenced-based change relying on the following evidence:
    - Literature and medical judgement showing that standardized POPH criteria should be updated to match recent clinical guidelines
- **Seeks to achieve the best use of donated organs**[32] **by** ensuring organs are allocated and transplanted according to medical urgency.
    - This proposal seeks to achieve the best use of donated organs by ensuring that only those candidates meeting established clinical criteria are able to receive standardized POPH exceptions.
- **Is designed to…promote patient access to transplantation**[33] **by** giving similarly situated candidates equitable opportunities to receive an organ offer.
    - This proposal is designed to promote patient access to transplantation by allowing candidates meeting established clinical criteria to be eligible for a standardized POPH exception.

This proposal is not based on the candidate's place of residence or place of listing. This proposal also preserves the ability of a transplant program to decline an offer or not use the organ for a potential

[28] Joost P.h. Drenth et al., "Medical and Surgical Treatment Options for Polycystic Liver disease1," *Hepatology* 52, no. 6 (2010): pp. 2223-2230, https://doi.org/10.1002/hep.24036.
[29] Hyunjin Ryu et al., "Total Kidney and Liver Volume Is a Major Risk Factor for Malnutrition in Ambulatory Patients with Autosomal Dominant Polycystic Kidney Disease," *BMC Nephrology* 18, no. 1 (2017), https://doi.org/10.1186/s12882-016-0434-0.
[30] 42 CFR §121.4(a).
[31] 42 CFR §121.8(a)(1).
[32] 42 CFR §121.8(a)(2).
[33] Id.

recipient,[34] and it is specific to an organ type, in this case livers.[35] The Committee intends to consider whether any transition measures are necessary for those candidates that currently qualify for the POPH exception prior to Board review of the proposal.

Although the proposal outlined in this briefing paper addresses certain aspects of the Final Rule listed above, the Committee does not expect impacts on the following aspects of the Final Rule:

- Shall be designed to avoid wasting organs, to avoid futile transplants, … and to promote the efficient management of organ placement;

Additionally, the OPTN issues the *Guidance to Liver Transplant Programs and the National Liver Review Board for Adult MELD Exception Review* for the operation of the OPTN.[36] This guidance will support the operation of the NLRB by assisting the reviewers with evaluating exception requests. The OPTN Final Rule requires the Board to establish performance goals for allocation policies, including "reducing inter-transplant program variance."[37] This guidance document will assist in reducing inter-transplant program variance by facilitating more consistent review of exception cases.

Implementation Considerations

Member and OPTN Operations

The proposed changes will require programming in UNet^{SM}, additional education, and logistical support from the OPTN.

The changes to the standardized criteria for POPH involve new data collection which is described in more detail in the "New Data Collection" section.

Operations affecting Histocompatibility Laboratories

This proposal does not impact the operations of histocompatibility laboratories.

Operations affecting Organ Procurement Organizations

This proposal does not impact the operations of organ procurement organizations.

Operations affecting Transplant Hospitals

The proposed changes to the standardized criteria for POPH exceptions involve new data collection, and therefore will require additional member action.

Two new fields will be added to the initial exception form for POPH, as well as new data validation and label changes. Three new fields will be added to the exception extension form for POPH and one field will be removed. Transplant programs will need to be familiar with the new data collection and develop processes to provide the necessary data.

[34] 42 CFR §121.8(a)(3).
[35] 42 CFR §121.8(a)(4).
[36] 2019 OPTN Contract Task 3.2.4: Development, revision, maintenance, of OPTN Bylaws, policies, standards and guidelines for the operation of the OPTN.
[37] 42 C.F.R. §121.8(b)(4)

In addition to the new data collection, the proposed changes to the explant pathology form review process will require members to submit additional documentation or imaging studies less frequently, as documentation will only be submitted when there is no evidence or treatment of HCC.

Transplant programs will also need to be aware of the pediatric ART and be prepared to speak to a more pediatric-focused audience when appealing cases to the pediatric ART.

Similarly, transplant programs will need to be familiar with the updated guidance for PLD.

Operations affecting the OPTN

OPTN implementation actions for the different components of this proposal are described in order below.

- **Exception form for POPH:** The proposed changes to the standardized criteria for POPH will require programming in UNet. The OPTN will need to alter the MELD or PELD initial exception form for POPH to match the changes to policy. The new pre-treatment MPAP and PVR thresholds will need to be programmed, as well as changing a current data label from "Test Date" to "Heart Catheterization Date." The data validation for the post-treatment MPAP and PVR values will need to be updated to allow for the new post-treatment criteria. Two new fields will be added to the form to allow transplant programs to document that other causes of pulmonary hypertension have been assessed and determined to not be a significant contributing factor and the presence of portal hypertension at the time of initial exception.

- **Exception Extension form for POPH**: The OPTN will also need to update the POPH exception extension form to meet the updated criteria in policy. One field, Peak mean pulmonary arterial pressure level in the past 90 days, will be removed. Three new fields, MPAP, pulmonary artery wedge pressure (PAWP) and cardiac output will be added to the extension form. These fields are identical to the initial exception form and are used to calculate PVR.

- **Explant Pathology Review**: The OPTN will also need to update the process for reviewing explant pathology forms to match the new policy language.

- **Pediatric ART:** The pediatric ART will be programmed into UNet and OPTN staff will be responsible for managing the pediatric ART roster and facilitating the ART meetings.

- **Communication and Education:** The OPTN will also be responsible for communicating the changes to members and updating educational resources.

Potential Impact on Select Patient Populations

This proposal will have an impact on a number of select patient populations.

Candidates with POPH will be impacted by the proposed changes to the standardized criteria for POPH exceptions. It is important to note that the updated criteria will not require any new or additional testing or procedures for these candidates. The Committee does not anticipate any candidates who

would have been eligible for a standardized POPH exception to no longer be able to receive a standardized exception.

The new pre-treatment criteria provide specific thresholds for the MPAP and PVR values to ensure that candidate's receiving an exception have moderate to severe POPH, but the Committee does not anticipate that programs would have applied for an exception for a candidate with mild POPH, despite the lack of specific criteria in current policy. Similarly, the Committee expects that requiring transplant programs to provide evidence that other causes of pulmonary hypertension have been assessed and determined not to be a significant contributing factor and evidence of portal hypertension at the time of initial exception should not preclude any candidate who would have previously been eligible for an exception from still being eligible. It is unlikely that a transplant program would have applied for a POPH exception for a candidate without meeting these criteria. These new requirements follow established standards of care and should be documented in the medical record already.[38]

The updated post-treatment and extension criteria should allow for more candidates to be able to receive a standardized exception as candidates with an MPAP greater than 35 will now be eligible for a standardized exception if the PVR is less than 240 dynes*sec/cm^5.[39]

The creation of a pediatric ART will allow for pediatric appeals to be reviewed by individuals with more pediatric expertise. This change will provide more equitable review of pediatric ART cases.

Transplant programs requesting an exception for candidates with PLD will have clearer guidance on an appropriate score to request for their candidate. Also, the addition of specific guidance for candidates with PLD needing a kidney will make it evident that these candidates should be considered for an exception. In addition, the updated language provides guidance for candidates who received a prior kidney transplant or have moderate to severe protein calorie malnutrition. These additions will allow more candidates with PLD to be appropriately considered for a MELD exception.

There is no anticipated negative impact for any patient group.

New Data Collection

The Committee submits the proposal to collect additional data under the authority of the OPTN Final Rule, which states the OPTN shall "maintain records of all transplant candidates, all organ donors and all transplant recipients"[40] and shall "…receive…such records and information electronically…"[41] The new data collection aligns with the OPTN Data Collection Principle to develop transplant, donation, and allocation policies.[42] The proposed new data collection is not available through other means for the relevant population of candidates and the OPTN is the appropriate body to collect such information. The Committee consulted with the OPTN Data Advisory Committee (DAC) and UNOS Data Governance staff to receive feedback and further refine the proposed data collection. The DAC reviewed the proposed data elements and data definitions and had no additional feedback. The Committee utilized a

[38] See OPTN Liver and Intestinal Organ Transplantation Committee meeting summary, April 14, 2020. Available at https://optn.transplant.hrsa.gov/
[39] Ibid.
[40] 42 CFR §121.11(a)(1)(ii)
[41] 42 CFR §121.11(a)(1)(iii)
[42] OPTN Data Collection Principles were approved by the OPTN Board of Directors in 2006.

data quality checklist to ensure that the proposed data elements are relevant, available, reliable, usable and do not pose an unrealistic administrative burden.

All changes to data collection as part of this proposal are within Waitlist[SM]. None of the new fields will be required. If a transplant program does not provide a response for one of the new fields, then the candidate will not be eligible to receive the standardized exception or extension and will have their case reviewed by the NLRB. This matches the fields currently on the forms.

Two new data elements will be added to the initial exception form for POPH to match the proposed changes to policy. These two new data elements are included in the **Table 2** below.

Table 2: New Data Collection: Initial POPH Exception

Corresponding Policy Language/Criteria	Data Element	Response Options	Data Definition
Other causes of pulmonary hypertension have been assessed and determined to not be a significant contributing factor	Have other causes of pulmonary hypertension been assessed and determined not to be a significant contributing factor?	Radio buttons: • Yes • No	Clinical guidelines for the treatment of POPH with liver transplantation indicate that other causes of pulmonary hypertension should be excluded. If other causes of pulmonary hypertension have been assessed and determined to not be a significant contributing factor, select Yes. If not, select No. Other causes of pulmonary hypertension include but are not limited to: idiopathic pulmonary hypertension, vasculitis (lupus), chronic pulmonary embolism, sickle cell anemia, and left heart failure.
Documentation of Portal Hypertension at the time of initial exception	Is there documentation of portal hypertension at the time of the initial exception?	Radio buttons: • Yes • No	If documentation of portal hypertension at the time of initial exception is available, select Yes. If not, select, No.

The Committee recognizes that the introduction of these data elements increases the data burden on transplant programs submitting POPH exceptions. However, the intent of the data collection is to ensure that only those candidates needing the additional MELD or PELD points are automatically approved for the exception and felt that the additional data burden was justified by this intent. The Committee agreed that responses to the data elements would be available for all relevant candidates due to the normal transplant evaluation process and no additional tests would be needed. The Committee attempted to make the data elements as simple and intuitive as possible.

In their deliberation, the Committee noted that all candidates being considered for a POPH exception are evaluated by a pulmonologist or cardiologist to ensure that there are no other causes of pulmonary hypertension. This evaluation is documented in the candidate's medical record. A transplant coordinator completing the exception form will need to find this information in the candidate's medical record or consult with the attending hepatologist.

Similarly, the Committee noted that documentation of portal hypertension should be available for any candidate with POPH needing a MELD or PELD exception. This information will be available in the candidate's medical record. A transplant coordinator completing the exception form will need to find this information in the candidate's medical record or consult with the attending hepatologist.

The Committee is seeking public feedback on the proposed data collection, particularly if the data definitions are helpful and clear.

In addition to the new data elements on the initial exception form, three new elements will be added to the exception extension form and one element will be removed. All of three of the new data elements are identical to fields on the initial exception form. The intent of the Committee was to match the post-treatment data collection and MPAP and PVR thresholds on the initial exception form. The three new data elements on the exception extension form are included in the **Table 3** below.

Table 3: New Data Collection: POPH Exception Extensions

Corresponding Policy Language/Criteria	Data Element	Response Options	Data Definition
MPAP	Mean Pulmonary Arterial Pressure (MPAP)	Numerical Value (mmHg)	Enter the mean pulmonary arterial pressure in mmHg. The initial mean pulmonary arterial pressure must be between 0 and 150.0 mmHg.
Value is used to calculate PVR	Pulmonary Artery Wedge Pressure (PAWP)	Numerical Value (mmHg)	Enter the pulmonary artery wedge pressure in mmHg. The initial pulmonary artery wedge pressure must be between 0 and 50.0 mmHg.
Value is used to calculate PVR	Cardiac Output	Numerical value (L/min)	Enter the cardiac output in L/min. The initial cardiac output must be between 0.20 and 15.00 L/min.

All of the values are obtained via right heart catheterization, which is already required as part of the extension criteria. Therefore, while there is new data collection involved, no new tests will be required. Transplant programs will just need to provide more information from the right heart catheterization. The current exception extension form has a field for the date that the right heart catheterization is completed. This field will be used to ensure that the values listed above are collected on the same date, as outlined in the proposed policy.

The field “Peak mean pulmonary arterial pressure (MPAP) level in the past 90 days” is being removed from the exception extension form. This field is no longer relevant with the incorporation of the new hemodynamic criteria and addition of the data elements described above.

The Committee is also seeking feedback on if the minimum cardiac output should stay at 0.20 L/min or if it should be 0.0 L/min and if the maximum value should be higher.

New Data Validation

The proposed changes to policy will necessitate the incorporation of new data validation for the hemodynamic lab values provided both before and after treatment on the initial exception form and on the exception extension form. Transplant programs will need to be familiar with the new data validation for the hemodynamic lab values.

Data Label Changes

On the current exception form, transplant programs must provide a test date documenting when the lab values were collected. In accordance with the policy change, the current test date field will now be labelled, "Heart Catheterization Date." There is no difference in the data that transplant programs must provide. However, they should be familiar with the updated data label.

Projected Fiscal Impact

Projected Impact on Histocompatibility Laboratories

There is no expected fiscal impact for histocompatibility laboratories.

Projected Impact on Organ Procurement Organizations

There is no expected fiscal impact for OPOs.

Projected Impact on Transplant Hospitals

There is minimal expected impact on transplant hospitals. There is no expected fiscal impact on OPOs or histocompatibility laboratories.

This proposal does not require any new testing and only requires transplant hospital staff to become familiar with the minor changes to the exception submission form as well as the guidance document. Staff time for additional data entry for a very small cohort of patients may increase.

Projected Impact on the OPTN

Preliminary estimates indicate that this would be a large effort, as over 100 hours may be needed for IT programming, communication, and ongoing monitoring. UNOS staff will also be responsible for coordinating the pediatric ART call on an ongoing basis.

Post-implementation Monitoring

Member Compliance

The Final Rule requires that allocation policies "include appropriate procedures to promote and review compliance including, to the extent appropriate, prospective and retrospective reviews of each transplant program's application of the policies to patients listed or proposed to be listed at the program."[43] The proposed language will not change the current routine monitoring of OPTN members. Site surveyors will continue to review a sample of medical records, and any material incorporated into the medical record by reference, for documentation that data reported through UNet is consistent with source documentation including all qualifying criteria used for standardized exceptions reported on the MELD or PELD exception or exception extension form.

[43] 42 CFR §121.8(a)(7).

This proposal includes language that will sure that the OPTN has sufficient and appropriate oversight over transplantation of candidates with HCC so that no program is consistently transplanting candidates without sufficient documentation of HCC.

Policy Evaluation

The Final Rule requires that allocation policies "be reviewed periodically and revised as appropriate."[44]

In addition to those monitoring reports and items previously enumerated in post-implementation evaluation plans related to the NLRB[45], the UNOS Research Department will analyze relevant outputs in pre vs. post analyses for the additional enhancements. Such analyses will continue the cadence of previously laid out evaluation plans (up to 36 months post-implementation of the NLRB), or longer if requested by the Committee.

Relevant analyses:

- Number of exception cases for portopulmonary hypertension
    - Overall, by automatic system approval/NLRB board review, case outcome, and by application type
- Distribution of automatic approval turn-down reasons for portopulmonary hypertension cases (reasons criteria was not met)
- Number of transplant recipients with portopulmonary hypertension exception
- Number of pediatric Appeals Review Team cases
    - Overall, by case outcome, and by diagnosis
- Number of exception cases for polycystic liver disease/polycystic liver and kidney disease
    - Overall, by case outcome, by application type, and by liver alone/liver-kidney registration status
- Number of transplant recipients with polycystic liver disease/polycystic liver and kidney disease

Conclusion

The NLRB has been in place for over a year and this proposal is the second round of improvements to the new exception review process. The proposed updates to the standardized criteria for POPH exception match updated clinical experience and ensure that the appropriate candidates are eligible for a standardized exception. The changes to the review process for explant pathology forms provides more appropriate oversight of programs submitting HCC exceptions. The creation of the pediatric ART and the use of an ART leader will improve the equity and efficiency with which ART appeals are reviewed. And finally, the changes to guidance for PLD will ensure that these candidates are appropriately considered for a MELD exception.

Together, these changes will improve the NLRB and the overall liver allocation system.

[44] 42 CFR §121.8(a)(6).
[45] *Proposal to Establish a National Liver Review Board*, OPTN Liver and Intestinal Organ Transplantation Committee, June 2017, Available at https://optn.transplant.hrsa.gov/

The Committee is seeking public feedback on all of the proposed changes but specifically:

1. Updated criteria for standardized POPH exceptions, especially the new data collection, data definitions, and if a threshold for the initial transpulmonary gradient to correct for volume overload is needed
2. If the updated policy language for reviewing *Post-Transplant Explant Pathology Forms* should state that the Committee has the ability to refer transplant programs to the MPSC
3. Specific responsibilities of the ART leader and if there should be an ART leader for the pediatric ART
4. If the updated guidance and score recommendation for PLD are clear and sufficient

Policy, Guidelines, and Guidance Language

Proposed new language is underlined (example) and language that is proposed for removal is struck through (~~example~~). Heading numbers, table and figure captions, and cross-references affected by the numbering of these policies will be updated as necessary.

9.5.G Requirements for Portopulmonary Hypertension MELD or PELD Score Exceptions

A candidate will receive a MELD or PELD score exception for portopulmonary hypertension if the transplant hospital submits evidence of *all* of the following:

1. Document via heart catheterization initial mean pulmonary arterial pressure (MPAP) level greater than or equal to 35 mmHg and initial pulmonary vascular resistance (PVR) level greater than or equal to 240 dynes*sec/cm^5 (or greater than or equal to 3 Wood units (WU)). These values must be from the same test date.
2. ~~Initial pulmonary vascular resistance (PVR) level~~
2. Other causes of pulmonary hypertension have been assessed and determined to not be a significant contributing factor
3. Initial transpulmonary gradient to correct for volume overload
4. Documentation of treatment
5. ~~Post-treatment MPAP less than 35 mmHg within 90 days prior to submission of the initial exception~~
6. ~~Post treatment PVR less than 400 dynes*sec/cm^5, or less than 5.1 Wood units (WU), on the same test date as post-treatment MPAP less than 35 mmHg~~
5. Document via heart catheterization within 90 days prior to submission of the initial exception either of the following:
    - Post-treatment MPAP less than 35 mmHg and post-treatment PVR less than 400 dynes*sec/cm^5 (or less than 5 Wood units (WU)). These values must be from the same test date.
    - Post-treatment MPAP greater than or equal to 35 mmHg and less than 45 mmHg and post-treatment PVR less than 240 dynes*sec/cm^5 (or less than 3 Wood units (WU)). These values must be from the same test date.
6. Documentation of portal hypertension at the time of initial exception

A candidate who meets the requirements for a standardized MELD or PELD score exception will be assigned a score according to *Table 9-7* below.

Table 9-7: Portopulmonary Hypertension Exception Scores

Age	Age at registration	Score
At least 18 years old	At least 18 years old	3 points below MMaT
At least 12 years old	Less than 18 years old	Equal to MMaT
Less than 12 years old	Less than 12 years old	Equal to MPaT

In order to be approved for an extension of this MELD or PELD score exception, transplant hospitals must submit an exception extension request according to *Policy 9.4.C: MELD or PELD Score Exception Extensions* with evidence of a heart catheterization since the last exception or extension request that confirms ~~the mean pulmonary arterial pressure (MPAP) remains less than 35 mmHg.~~ either of the following:

- MPAP less than 35 mmHg and post-treatment PVR less than 400 dynes*sec/cm^5 (or less than 5 Wood units (WU)). These values must be from the same test date.
- MPAP greater than or equal to 35 mmHg and less than 45 mmHg and post-treatment PVR less than 240 dynes*sec/cm^5 (or less than 3 Wood units (WU)). These values must be from the same test date.

9.5.I.i Initial Assessment and Requirements for HCC Exception Requests

Prior to applying for a standardized MELD or PELD exception, the candidate must undergo a thorough assessment that includes *all* of the following:

1. An evaluation of the number and size of lesions before local-regional therapy that meet Class 5 criteria using a dynamic contrast enhanced computed tomography (CT) or magnetic resonance imaging (MRI)
2. A CT of the chest to rule out metastatic disease
3. A CT or MRI to rule out any other sites of extrahepatic spread or macrovascular involvement
4. An indication that the candidate is not eligible for resection
5. An indication whether the candidate has undergone local-regional therapy
6. The candidate's alpha-fetoprotein (AFP) level

The transplant hospital must maintain documentation of the radiologic images and assessments of all OPTN Class 5 lesions in the candidate's medical record. If growth criteria are used to classify a lesion as HCC, the radiology report must contain the prior and current dates of imaging, type of imaging, and measurements of the lesion.

For those candidates who receive a liver transplant while receiving additional priority under the HCC exception criteria, the transplant hospital must submit the *Post-Transplant Explant Pathology Form* to the OPTN Contractor within 60 days of transplant. If the pathology report does not show evidence or treatment of HCC, the transplant hospital must also submit documentation or imaging studies confirming HCC at the time of assignment. The Liver and Intestinal Organ Transplantation Committee will review a transplant hospital when more than 10 percent of the ~~HCC cases in a one-year period are not supported by the required pathologic confirmation or submission of clinical information.~~ *Post-Transplant Explant Pathology Forms* submitted in a one year period do not show evidence or treatment of HCC.

National Liver Review Board Operational Guidelines

1. Overview

The purpose of the National Liver Review Board (NLRB) is to provide fair, equitable, and prompt peer review of exceptional candidates whose medical urgency is not accurately reflected by the calculated MELD/PELD score. The NLRB will base decisions on policy, the guidance documents, and in cases which lack specific guidance, the medical urgency of the candidate as compared to other candidates with the same MELD or PELD score.

The NLRB is comprised of specialty boards, including:

- Adult Hepatocellular Carcinoma (HCC)
- Adult Other Diagnosis
- Pediatrics, which reviews requests made on behalf of any candidate registered prior to turning 18 years old and adults with certain pediatric diagnoses

The immediate past-Chair of the Liver and Intestinal Organ Transplantation Committee serves as the Chair of the NLRB for a two year term.

2. Representation

Every active liver transplant program may appoint a representative and alternate to each of the adult specialty boards. A liver transplant program with an active pediatric component may appoint a representative and alternate to the pediatric specialty board. Individuals may serve on more than one specialty board at the same time. Transplant programs are encouraged to appoint representatives from both hepatology and surgery who have active transplant experience. Liver transplant programs are not required to provide a representative to the NLRB.

Representatives and alternates serve a one year term. A liver transplant program may appoint the same representative or alternate to serve consecutive terms.

If a transplant hospital withdraws or inactivates its liver program, it may not participate in the NLRB. However, the transplant hospital's participation may resume once it has reactivated its liver program.

3. Representative and Alternate Responsibilities

Prior to each term of service, representatives and alternates are required to sign the *UNOS Confidentiality and Conflict of Interest Statement* and complete orientation training.

Representatives must vote within 7 days on all exception requests, exception extension requests, and appeals. A representative will receive an e-mail reminder after day 3 and day 5 if the representative has an outstanding vote that must be completed. On the eighth day, if the vote has not been completed, then the request will be randomly reassigned to another representative. The original reviewer will receive a notification that the request has been reassigned.

The representative must notify UNOS in UNet^{SM} of an absence, during which the alternate will fulfill the responsibilities of the representative.

If a representative or alternate does not vote on an open request within 7 days on more than 5% of the cases assigned to that reviewer within a 6 month period, the Chair may remove the individual from the NLRB. If a representative or alternate does not vote because a case is approved and closed before the 7 day timeframe expires, it is not considered a failure to vote. A representative or alternate who has been removed for failure to perform the duties required is not eligible to serve again for 3 years.

If a transplant program exhibits a pattern of non-responsiveness, as evidenced by the removal of two members from the NLRB, the Chair may suspend the program's participation for a period of three months after notifying the program director. Further non-compliance with the review board process may result in cessation of the program's representation on the NLRB until such a time as the transplant hospital can satisfactorily assure the Chair that it has addressed the causes of non-compliance.

4. Voting Procedure

An exception request is randomly assigned to five representatives of the appropriate specialty board. A representative may vote to approve or deny the request, or ask that the request be reassigned. The request must achieve four out of five affirmative votes in order to be approved. If the request does not achieve the necessary four affirmative votes, it is denied.

As part of the MELD/PELD Exception program in UNet^{SM}, NLRB members are notified of new cases by email.

Voting on an exception request is closed either at the end of the appeal period or when no additional votes will change the outcome of the vote, whichever occurs earlier. Members no longer have the ability to vote once a request is closed.

5. Appeal Process

A liver program may appeal the NLRB's decision to deny an exception request. Patients are not eligible to appeal exception requests. All reviewer comments are available in UNet^{SM}. The NLRB advises programs to respond to the comments of dissenting reviewers in the appeal.

The same five members that reviewed the original request will review the appeal. The appeal must achieve four out of five affirmative votes in order to be approved. If the appeal does not achieve the necessary four affirmative votes, it is denied. If the appeal is denied, the liver program may request a conference call with the Appeals Review Team (ART).

If the ART denies the request, the liver program may initiate a final appeal to the Liver and Intestinal Organ Transplantation Committee (Liver Committee). Referral of cases to the Liver Committee will include information about the number of previous referrals from that program and the outcome of those referrals.

6. Appeals Review Team (ART)

At the beginning of each new service term, nine NLRB members from the Adult Other Diagnosis and Adult HCC specialty boards are ~~randomly~~ assigned to serve each month of the year on the Adult ART and nine NLRB members from the Pediatric specialty board are assigned to serve each month of the year on the

Pediatric ART. There may be multiple ARTs, depending on the volume of cases. ~~An NLRB member will be selected to serve for no more than one month each year on the ART. The ART meets via conference call at the same day and time each week; however calls may be rescheduled in advance to accommodate federal holidays.~~ Each ART will be scheduled to meet via conference call according to a predetermined schedule.

ART appeals from the Adult Other Diagnosis and Adult HCC specialty boards will be reviewed by the Adult ART. ART appeals from the Pediatric specialty board will be reviewed by the Pediatric ART.

In the event of a planned absence, the ART member may designate their alternate to serve. The representative must notify UNOS of this in UNet^{SM}.

Five members of the ART must participate in the call. If at least five members do not attend the call, the appeal will be rescheduled for the following regularly scheduled conference call. If at least five members do not attend the second attempt to review the appeal, the candidate's exception request is automatically approved.

The appeal must achieve a majority plus one affirmative votes in order to be approved.

A representative at the petitioning program may serve as the candidate's advocate. If a representative is unable to attend the conference call, the program may ask for the appeal to be scheduled for the following regularly scheduled conference call. If after two attempts a representative is unable to attend the call, the ART will review the appeal without the program's participation. In the absence of a representative on the conference call, the program may submit written information for the ART's consideration.

The ART will work with UNOS staff to document the content of the discussion and final decision in UNet^{SM}.

7. Liver Committee Review

The Liver Committee may delegate review to a subcommittee. If the review is delegated, majority is based on the size of the subcommittee.

Appeals to the Liver Committee will be considered electronically unless at least one member of the Liver Committee requests a conference call. If the case is discussed on a conference call, quorum is a majority of the Liver Committee (or the subcommittee, if delegated).

The appeal must achieve a majority affirmative votes in order to be approved.

Guidance to Liver Transplant Programs and the National Liver Review Board for Adult MELD Exception Review

Polycystic Liver Disease (PLD)

Certain patients with PLD may benefit from MELD exception points. Indication for an exception include those with PCLKD (Mayo type D or C) with severe symptoms plus *any* of the following:

- Hepatic decompensation
- Concurrent hemodialysis
- GFR less than 20 ml/min
- Patient with a prior kidney transplant
- Moderate to severe protein calorie malnutrition

Transplant programs should provide the following criteria when submitting exceptions for PLD. The Review Board should consider the following criteria when reviewing exception applications for candidates with PLD.

1. Management of PLD

PLD Classification – *Mayo Modification*

Types	**A**	**B**	**C**	**D**
Symptoms	0 - +	++/+++	++/+++	++/+++
Cyst Findings	Focal	Focal	Diffuse	Diffuse
Spared Remnant Volume	≥3	≥2	≥1	<1
PV/HV Occlusion	No	No	No	Yes

2. Surgical Management of PLD
    - Indications:
        a. Types C* and D ***and*** at least 2 of the following:
            - Hepatic decompensation
            - Concurrent renal failure (dialysis)
        b. Compensated comorbidities

        Note: Prior resection/fenestration, alternative therapy precluded.

Patients who meet the criteria above should be considered for a MELD exception similar to other policy-assigned exception scores. ~~for MELD exception points such that transplantation may be expected within the year.~~

When a candidate also meets the medical eligibility criteria for liver-kidney allocation as described in *OPTN Policy 9.9: Liver-Kidney Allocation* and is registered on the kidney waitlist, the candidate should be considered for a MELD exception score similar to the score assigned to candidates with primary hyperoxaluria in OPTN Policy.

OPTN

Public Comment Proposal

Align OPTN Policy with U.S. Public Health Service Guideline, 2020

OPTN Ad Hoc Disease Transmission Advisory Committee

Prepared by: Emily Ward
UNOS Policy and Community Relations Department

Contents

Align OPTN Policy with U.S. Public Health Service Guideline, 2020

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Sponsoring Committee:	*Ad Hoc Disease Transmission Advisory*
Public Comment Period:	*August 4, 2020 – October 1, 2020*

Executive Summary

This proposal revises OPTN policies to be in alignment with the most up to date Public Health Service (PHS) recommendations for mitigating the risk of acquiring human immunodeficiency virus (HIV), hepatitis B (HBV) and hepatitis C (HCV) through organ transplantation. The OPTN Final Rule requires the OPTN to develop policies "consistent with recommendations of the Centers for Disease Control and Prevention, for the testing of organ donors and follow-up of transplant recipients to prevent the spread of infectious diseases." [1]

This proposal seeks to modify existing OPTN policy to reflect recommendations outlined in the updated PHS publication. [2] The major categories of proposed policy modifications include:

- Risk assessment of living and deceased donors
- Living and deceased solid organ donor testing
- Transplant candidate informed consent
- Recipient testing and reporting
- Collection and storage of donor and recipient specimens

[1] 42 C.F.R. §121.4(a)(2)

[2] JM Jones, I Kracalik, ME Levi, et al, "Assessing Solid Organ Donors and Monitoring Transplant Recipients for Human Immunodeficiency Virus, Hepatitis B Virus, and Hepatitis C Virus Infection — U.S. Public Health Service Guideline, 2020," *Morbidity and Mortality Weekly Report*, 69, (No. RR-4), June 26, 2020, 1-16, http://dx.doi.org/10.15585/mmwr.rr6904a1.

The revisions published by the PHS are in response to concerns by the OPTN and the greater transplant community that more donors were being classified as increased risk than appropriate and it was leading to unnecessary discard or turndowns of these organs. Organ transplant candidates who are on the waiting list are at high risk for death, and those who decline organs designated as increased risk have higher rates of death and graft failure than patients who accept increased risk organs.[3,4,5] The 2020 revisions to criteria are overall less restrictive than the current ones, with the additional safeguards of more testing on donors and recipients to identify potential disease transmission.

The intent of revising OPTN policy is to maintain transplant recipient safety while more accurately identifying organ donors that have certain risk factors for acute human immunodeficiency virus (HIV), hepatitis B (HBV), and hepatitis C (HCV) infection. The risks of using these organs remains low due to use of sensitive molecular testing and the rising availability of effective treatments should unintended transmission occur.

[3] MG Bowring CM Holscher, S Zhou, et al., "Turn down for what? Patient outcomes associated with declining increased infectious risk kidneys," *American Journal of Transplantation*, March 2018; 18: 617–24, https://doi.org/10.1111/ajt.14577.
[4] KP Croome, DD Lee, S Pungpapong, et al.," What are the outcomes of declining a Public Health Service increased risk liver donor for patients on the liver transplant waiting list?" *Liver Transplantation,* (24)*,* April 2018, 497–504, https://doi.org/10.1002/lt.25009.
[5] Organ Procurement and Transplantation Network. National data. Richmond, VA: US Department of Health and Human Services, Health Resources and Services, Organ Procurement and Transplantation Network, https://optn.transplant.hrsa.gov/data/view-data-reports/ national-data/.

Background

Recommendations to help prevent transmission of infectious disease from organ donors have been developed and subsequently updated by the Centers for Disease Control and Prevention (CDC), part of the U.S. Public Health Service (PHS), for the past 35 years. The first recommendation was developed in 1985 when Acquired Immune Deficiency Syndrome (AIDS) was emerging and the associated scientific knowledge was in its infancy. The recommendation was that organ donors be tested for antibodies to Human T-Lymphotrophic Virus III/Lymphadenopathy Associated Virus when feasible and that persons in groups recognized as having an increased risk for AIDS not be used as organ donors regardless of the test results.[6]

TheOrgan Procurement and Transplantation Network (OPTN) Final Rule, which became effective in 2000, required that the OPTN Board of Directors develop policies "consistent with recommendations of the Centers for Disease Control and Prevention, for the testing of organ donors and follow-up of transplant recipients to prevent the spread of infectious diseases". [7] This requirement remains today.

Background: 2013 PHS Guideline

The *PHS Guideline* is intended to reduce the risk of unintended transmission of disease through organ transplantation. The 2013 *Guideline*, originally released for public comment by the CDC in 2011, added measures to assess and mitigate HBV and HCV risk.[8] After reviewing significant feedback from the OPTN that included input from the Ad Hoc Disease Transmission Advisory Committee (DTAC) and other OPTN Committees, the CDC finalized the "*PHS Guideline for Reducing Human Immunodeficiency Virus (HIV), Hepatitis B Virus (HBV), and Hepatitis C Virus (HCV) Through Organ Transplantation*" in 2013.[9] In addition to outlining fourteen criteria to assess donor risk for HIV, HBV, and HCV, the updated *Guideline* also provided 34 specific recommendations (and sub-recommendations) regarding living and deceased donor testing, pre- and post-transplant recipient testing, and extra vessels usage.

The 2013 *Guideline* was the most expansive to date and the subsequent result was a significant number of organs being placed under the newly termed "increased risk designation (IRD)" category. Changes were made to the living donor medical/social evaluation, informed consent was required for IRD donors, and HCV nucleic acid testing (NAT) was required for all donors. Increased risk donors were required to have either HIV NAT or antibody/antigen (Ab/Ag) testing. Due to the extensive nature of the 2013 revisions, a joint workgroup, including the DTAC, other OPTN committee members, and representatives from the major professional transplant societies studied the revisions and developed proposals to align

[6] CDC, "Provisional Public Health Service inter-agency recommendations for screening donated blood and plasma for antibody to the virus causing acquired immunodeficiency syndrome," *Morbidity and Mortality Weekly Report*, May 24, 1985;34:15, https://www.cdc.gov/mmwr/preview/mmwrhtml/00000547.htm.

[7] 42 C.F.R. §1 21.4(a)(2).

[8] CDC, Proposed Guideline, "Public Health Service Guideline for Reducing Transmission of Human Immunodeficiency Virus (HIV) Hepatitis B Virus (HBV), and Hepatitis C Virus (HCV) Through Organ Transplantation,", September 21, 2011, https://www.regulations.gov/docket?D=CDC-2011-0011.

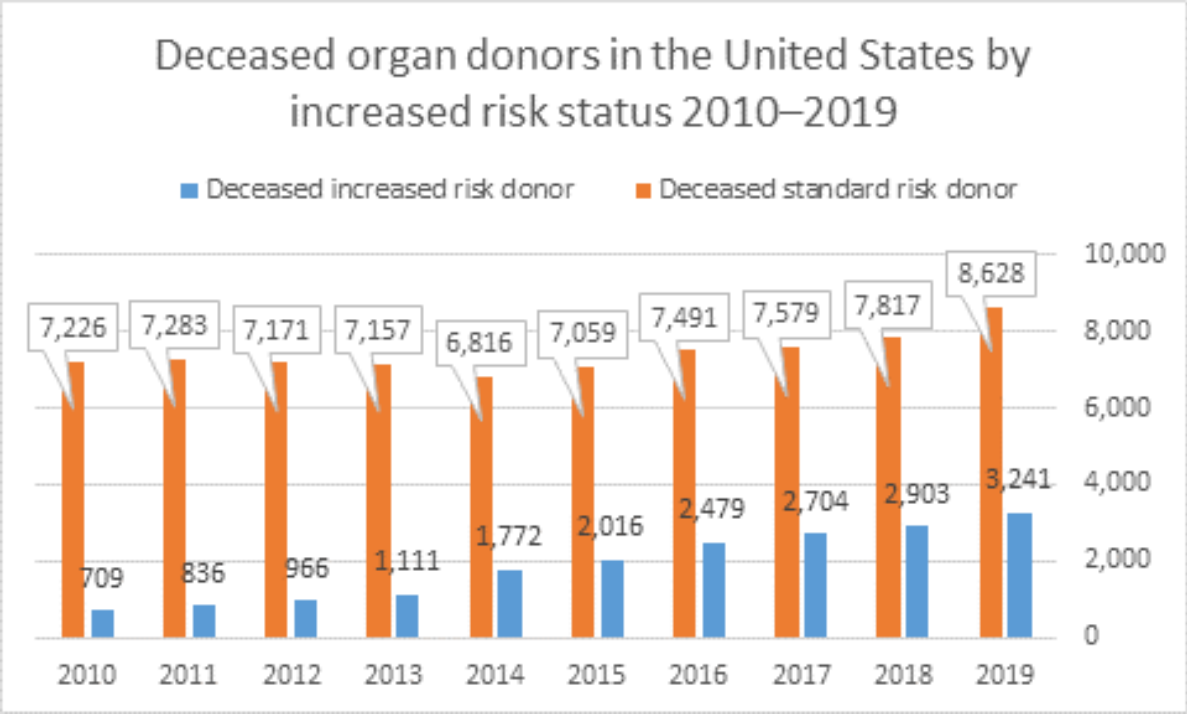
[9] DL Seem, I Lee, C Umscheid, et al, " Public Health Service Guideline for Reducing Transmission of Human Immunodeficiency Virus (HIV) Hepatitis B Virus (HBV), and Hepatitis C Virus (HCV) Through Organ Transplantation", *Public Health Reports*, 128 (4), July 2013, 247-343, https://doi.org/10.1177/003335491312800403.

OPTN policies with the 2013 *Guideline* that were ultimately adopted by the OPTN Board of Directors.[10,11,12] In 2015, the final policy alignment, NAT testing, was implemented.

The CDC Responds the Community's Requests for Revisions

Since the implementation of the 2013 *PHS Guideline*, the OPTN, CDC, and greater transplant community received community feedback and began to identify unintended consequences associated with the related OPTN policy changes. Donors classified under the PHS increased risk criteria grew from 13% in 2013 to 27% in 2019. **Chart 1** below illustrates the significant increase from 2014-2019 in those deceased donors classified under the IRD designation.[13] There was concern in the transplant community that more donors were being classified as IRD risk than appropriate and it was leading to unnecessary discard or turndowns of these organs. There is indication of significant differences in use of organs based on PHS increased risk criteria.[14] Based on transplant community feedback and its own subject matter expertise, the DTAC requested that the CDC revisit the *Guideline* to address these concerns. DTAC cited the need to adequately balance the risk of not using IRD organs and waitlist mortality along with the growing availability of effective detection and treatment for HIV, HBV, and HCV.

Chart 1: Deceased Organ Donors in the U.S. by Risk Status, 2010-2019[15]



[10] Policy Clarifications Resulting from June 19, 2013, Release of the PHS Guideline for Reducing HIV, HBV, and HCV through Organ Transplantation, available at: https://optn.transplant.hrsa.gov/media/1562/policynotice_20130801.pdf.
[11] Proposal to Modify Deceased Donor Testing Requirements, OPTN Policy Notice, July 23, 2014, available at: https://optn.transplant.hrsa.gov/media/1280/policynotice_20140724.pdf.
[12] Aligning OPTN Policies with the 2013 PHS Guideline for Reducing Transmission of HIV, HBV, and HCV through Solid Organ Transplantation, OPTN Policy Notice, February 1, 2014, Available at: https://optn.transplant.hrsa.gov/media/1140/policy_notice_12-2014.pdf.
[13] OPTN data as of July 3, 2020.
[14] WE Abara, MG Collier, A Moorman, et al., "Trends in Deceased Solid Organ Donor Characteristics and Hepatitis B, C, and HIV Screening Results—United States, 2010–2017," *Morbidity and Mortality Weekly Report*, 68(3), January 25, 2019, 61-66, http://dx.doi.org/10.15585/mmwr.mm6803a2.
[15] OPTN data as of July 3, 2020.

In response to this feedback and request, the CDC conducted and published more recent research specific to solid organ transplantation to inform next steps to revise the 2013 *PHS Guideline*.[16,17,18,19] CDC research suggests that donors, when tested with NAT, have less than a 1/1,000,000 risk of undetected infection within 14 days of potential increased risk behaviors for HIV and HCV and within 30 days for HBV.[20]

Highlights from the four CDC research publications found:

- IRD donors are more likely to be infected with HCV than non-IRD donors
- Transmissions of HBV and HCV from recently infected IRD to organ recipients continue to occur, but early identification and treatment can improve outcomes
- IRD designation is associated with underutilization of adult lungs and kidneys and pediatric hearts
- Period during which reported donor risk behaviors result in IRD designation can be safely shortened
- Hemodialysis can be removed as IRD criteria while preserving safety

The CDC presented findings at the Advisory Committee on Blood and Tissue Safety and Availability (ACBTSA) in April 2019.[21] OPTN representatives shared their support and comments at this meeting. Proposed revisions were published subsequently in the Federal Register for public comment in August 2019.[22]

The OPTN submitted a formal public comment response citing support for a new term to replace "increased risk donor," shortening risk factor criteria from 12 months, universal post-transplant recipient testing, and revision of hemodialysis and hemodilution risk criteria.[23] A request was made to modify the requirement for repeat deceased donor testing was made as only 44 known HIV, HBV, or HCV transmissions occurred from donors between 2008 and 2018, showing the overall low risk of disease transmission from deceased donors did not adequately support the recommendation.[24] The OPTN also opposed the recommendation that living donor testing be performed within a 7-day period prior to organ recovery. The OPTN cited that only three known transmissions of HIV, HBV, or HCV from living donors between 2008 and 2018 demonstrating the low risk of disease transmission from living

[16] JM Jones, BM Gurbaxani, A Asher, et al, "Quantifying the risk of undetected HIV, Hepatitis B virus, or Hepatitis C virus infection in Public Health Service increased risk donors," *American Journal of Transplantation*, (9), September 2019, 2583-2593, https://doi.org/10.1111/ajt.15393.

[17] MRP Sapiano, JM Jones, J Bowman, et al, "Impact of U.S. Public Health Service increased risk deceased donor designation on organ utilization," *American Journal of Transplantation*, (9), September 2019, 2560-2569, https://doi.org/10.1111/ajt.15388.

[18] D Bixler, P Annambhotla, WE Abara, et al, "Hepatitis B and C virus infections transmitted through organ transplantation investigated by CDC, United States, 2014-2017," *American Journal of Transplantation*, (9), September 2019, 2570-2582, https://doi.org/10.1111/ajt.15352.

[19] WE Abara, MG Collier, A Moorman, et al, "Characteristics of Deceased Solid Organ Donors and Screening Results for Hepatitis B, C, and Human Immunodeficiency Viruses—United States, 2010–2017," *Morbidity and Mortality Weekly Report*, 68 (3), January 25, 2019, 61-66, http://dx.doi.org/10.15585/mmwr.mm6803a2.

[20] JM Jones, "Quantifying the risk".

[21] ACBTSA April 16, 2019 - Meeting Summary, Office of Infectious Disease and HIV/AIDS Policy, HHS.gov, available at: https://www.hhs.gov/oidp/advisory-committee/blood-tissue-safety-availability/meeting-summary/2019-04-16/index.html.

[22] "Request for Information-Revisions to the PHS Guideline for Reducing Human Immunodeficiency Virus (HIV), Hepatitis B Virus (HBV), and Hepatitis C Virus (HCV) Through Organ Transplantation; Extension of Comment Period", August 27, 2019, available at: https://www.federalregister.gov/documents/2019/09/20/2019-20419/request-for-information-revisions-to-the-phs-guideline-for-reducing-human-immunodeficiency-virus-hiv.

[23] OPTN Memorandum, "Comments on Revisions to the PHS Guideline for Reducing Human Immunodeficiency Virus (HIV), Hepatitis B Virus (HBV), and Hepatitis C Virus (HCV) Through Organ Transplantation," September 16, 2019.

[24] OPTN data as of September 6, 2019.

donors under the current 28-day testing requirement.[25] The OPTN's contributing stakeholder committees (DTAC, Organ Procurement Organization, Operations and Safety, Living Donor, Ethics, Transplant Coordinators, and Transplant Administrators) were overall supportive of the revisions.

The CDC published the revised PHS recommendations, "*Assessing Solid Organ Donors and Monitoring Transplant Recipients for Human Immunodeficiency Virus, Hepatitis B Virus, and Hepatitis C Virus Infection — U.S. Public Health Service Guideline, 2020,* "on June 26, 2020.[26] In response to OPTN concerns, the published *Guideline* left the current 28-day living donor testing timeframe. The repeat testing requirement was modified to require deceased donor specimens be collected within 96 hours before organ procurement with results of these screening tests available at the time of organ procurement. There was no time frame specified for pre-transplant deceased donor testing in the 2013 *Guideline*.

The OPTN Prepares to Align Policy to Updated 2020 PHS Guideline

Prior to release of the 2020 *PHS Guideline*, the DTAC formed a PHS workgroup in February 2020, in anticipation of the changes to be published later in the year. The workgroup included representatives from the following stakeholder groups:

- OPTN Committees: DTAC, Ethics, Living Donor, Operations and Safety, Patient Affairs, Pediatrics, Transplant Administrators, and Transplant Coordinators
- Transplant Societies: American Society of Transplantation (AST), American Society of Transplant Surgeons (ASTS), Association of Organ Procurement Organizations (AOPO), and NATCO
- Federal Government: Human Resources and Services Administration (HRSA) and CDC

Potential Impact to Data Collection

The DTAC submitted a formal memorandum on behalf of the workgroup to the OPTN Data Advisory Committee (DAC) on February 24, 2020, informing the DAC of potential data changes to OPTN data. The memorandum detailed potential changes to data elements in DonorNet®, including removal of terminology using "increased risk", addition of fields to identify individual risk criteria, and change to functionality of date fields associated with testing and recovery. Data element changes in TIEDI® candidate forms could include addition of vaccination data, and fields to track and report HIV, HBV, and HCV universal testing.

Workgroup Considers Policy Changes

The PHS released its published Guideline on June 26, 2020 with the expectation that revised OPTN policies to align with the new recommendations would be sent to the OPTN Board of Directors for consideration at their December 2020 meeting. [27]

A crosswalk outlining detailed changes between 2013 and 2020 PHS Guidelines and OPTN Policy (current and proposed) is available in ***Appendix A***. Highlights of major changes include:

1. Risk assessment of living and deceased donors: Fewer donor risk criteria and risk assessment prior to organ procurement shortened from twelve months to one month and removal of using term "increased risk donor"

[25] Ibid.
26 JM Jones, "Assessing Solid Organ Donors".
27 Ibid.

2. Living and deceased solid organ donor testing: Requirement for universal testing for HIV, HBV, and HCV on all recipients
3. Transplant candidate informed consent: Replacement of “informed consent” with a risk factor discussion between provider and candidate
4. Recipient testing and reporting: Requirement of universal NAT testing post-transplant and requirement to assess need for HBV vaccination pre-transplant and to report status to OPTN
5. Collection and storage of donor and recipient specimens: Requirement to store living donor blood specimens for at least 10 years

This proposal contains policy changes related to nearly all areas where the *PHS Guideline* has been revised. The OPTN Policy definition for the *PHS Guideline* has been proposed to be updated to reference the 2020 version. All policy requirements that refer to the need to conduct a donor medical/social assessment will then be referring to the 2020 *PHS Guideline* which removes four risk criteria currently used since 2013 and shortens the donor assessment timeframe. This timeframe would be reduced from the donor having any risk criteria present in the past year to the past 30 days of the assessment date.

The *PHS Guideline* recommends that all candidates receive HBV vaccination. The PHS workgroup and DTAC strongly supported proposing OPTN policy requiring Hepatitis B vaccination for candidates. However, the OPTN requirement to be consistent with CDC recommendations is for donor testing and recipient follow up. Proposed policy would require an assessment of the need for HBV vaccination and reporting to the OPTN when vaccination cannot be initiated or completed. The proposed policy requiring data regarding HBV vaccination will enable the OPTN to assess HBV immunity status and prevention of infectious disease. Community feedback on specific data collected is requested.

In addition, the proposal contains slightly expanded timeframes for post-transplant recipient testing. The Committee believes the proposed timeframes are consistent with the CDC recommendations and still meet the Final Rule requirement but that the timeframes needed slight adjustment to accommodate operations and recipient follow up activities without compromising the intent or patient safety.

Purpose

The U.S. PHS "*Guideline for Reducing Human Immunodeficiency Virus, Hepatitis B Virus, and Hepatitis C Virus Transmission Through Organ Transplantation*" was last revised in 2013, upon which the OPTN aligned its policies to be consistent with the Guideline and educated the transplant community on these changes.[28] The 2013 *PHS Guideline* recommendations were not intended to restrict transplantation or exclude specific donors but rather to facilitate appropriate donor laboratory screening, enhance informed decision-making by transplant candidates and families, and ensure prompt recognition and treatment of donor-derived infections.

The CDC, which administers the PHS, evaluated and revised the 2013 *PHS Guideline* on June 26, 2020 at the request of the OPTN and greater transplant community. Several advances in solid organ transplantation, including universal implementation of nucleic acid testing (NAT) of solid organ donors for HIV, HBV, and HCV, improved understanding of risk factors for undetected organ donor infection with these viruses, and the availability of highly effective treatments for infection with these viruses are reasons for the requested and proposed revisions.[29] The PHS recommendations pertain to transplantation of solid organs procured from donors without laboratory evidence of HIV, HBV, or HCV

28 DL Seem, "PHS Guideline”.
29 JM Jones, “Assessing Solid Organ Donors”.

infection, for identification of risk criteria for these infections among solid organ donors, implementation of laboratory screening of solid organ donors, and monitoring of solid organ transplant recipients.

This proposal revises OPTN Policies to be in alignment with the most up to date PHS recommendations, as required by the OPTN Final Rule. The OPTN Final Rule requires that the OPTN develop policies consistent with recommendations of the Centers for Disease Control and Prevention, for the testing of organ donors and follow-up of transplant recipients to prevent the spread of infectious diseases." [30]

Overview of Proposal

This proposal would align OPTN Policy to the 2020 *PHS Guideline*. Each Guideline is included in language revisions and is outlined in detail in ***Appendix A***. The revisions resulted from the PHS workgroup and DTAC discussions.

Below is a summary of proposed changes to OPTN Policies to align to the 2020 *PHS Guideline*:

1. **Risk assessment of living and deceased donors**
   - Change definition of *US PHS Guideline* to refer to the 2020 version which results in:
     - Shorten risk criteria inclusionary timeframe from twelve months to one month
     - Remove four risk criteria including hemodialysis and hemodilution
   - Remove specific label of "increased risk designation" (IRD) to describe donors with risk factors for acute HIV, HBV, and HCV infection

PHS Workgroup and DTAC Rationale: Both the PHS workgroup (WG) and the DTAC expressed universal support for changes to risk criteria and shortening of the timeframe due to the evidence from the CDC studies and the new testing requirements that will decrease chances of missing unintended transmission.

Recent DTAC policy evaluation and CDC research have not found that hemodiluted specimens result in undetected transmissions of HIV, HBV, or HCV. Hemodilution was removed from the risk criteria for 2020. OPTN policy is proposed to be modified to remove hemodilution as a PHS risk criteria. Some members have expressed that policy requiring a hemodilution calculation needs to remain for other reasons such as impact on interpreting results for common infections such as cytomegalovirus (CMV) and Epstein-Barr virus (EBV), blood type (ABO) testing or tissue requirements. Other members do not believe that hemodilution assessment needs to remain in OPTN policy given the HIV, HBV, and HCV findings. DTAC plans to assess public comment regarding the need to keep hemodilution calculation in OPTN policy. The current proposal removes hemodilution as a PHS risk criteria but keeps the overall requirement to perform the assessment. The DTAC may propose removing hemodilution calculation requirements based on public comment.

The WG and DTAC support the removal of the term "increased risk designation" or "increased risk donor," due to the perceived and potentially over-magnified concerns the term elicits and subsequent underutilization of organs. Several studies, cited by the CDC, have reported underuse of organs from

30 42 C.F.R. §121.4(a)(2).

donors designated as high risk or increased risk.[31,32] These groups did note that it may be difficult without a specific term but that the discussions with candidates should be done contextually along with other organ offer risks. Proposed policy language removes all references to this term in an effort to decrease underuse of organs. The replacement language refers to "risk criteria" for "acute HIV, HBV, or HCV infection" which is the same language used in the revised Guideline.

2. Living and deceased solid organ donor testing

- Add new required testing for all potential living and deceased organ donors:
  - HIV: NAT
  - HBV: NAT
- Require deceased donor specimen collected within 96 hours before organ procurement

PHS Workgroup and DTAC Rationale:
The WG and DTAC support these changes. OPTN data analysis showed that of 10,286 deceased donors in 2017, nearly all had NAT testing performed (10,284 had HBV NAT and 10,285 had both HCV and HIV NAT). Among living donors, 6,161 out of 6,188 (99.6%) had HBV and HCV NAT testing in 2017.[33] HIV NAT testing could not be determined because the OPTN reporting field is for serostatus and is not test specific. NAT testing is already an accepted practice among the transplant community.

The collection time period adjustment to 96 hours sufficiently addresses the OPTN public comment made regarding the timeframe for deceased donor sample collection. None of the WG or DTAC members expressed concern over this requirement.

3. Transplant candidate informed consent

- Remove requirement to obtain "informed consent"
- Add requirement that transplant hospitals inform intended recipients when the donor has any risk criteria

PHS Workgroup and DTAC Rationale: The revised Guideline removes separate and specified informed consent for use of IRD organs, and instead requests that a discussion about identified donor risk criteria occur between the intended recipient and the provider. During discussions, the CDC ex-officio DTAC member emphasized that risks of disease transmission from donors with identified HIV, HBV, and HCV risk criteria who test negative are low and the formal specific informed consent process may lead to organ decline thereby increasing the risk of mortality on the waitlist. The WG emphasized the need for a contextualized discussion taking into account the following: mortality on the waitlist, risk of mortality associated with the decline of organs with risk factors for acute HIV, HBV and HCV, the risk of transmission, available therapies for these viruses, as well as the favorable outcomes associated with prompt detection and initiation of therapy. There was concern from some WG members that disclosure of specific donor risk factors could cause a breach in confidentiality. Members of the PHS WG made inquiries about how much should be disclosed to the recipient. Given the differences in transplant

[31] ML Volk, AR Wilk, C Wolfe, DR Kaul, "The 'PHS increased risk' Label Is Associated With Nonutilization of Hundreds of Organs per Year," *Transplantation,* 101 (7), 2017, 1666–9, https://doi.org/10.1097/tp.0000000000001673.
[32] TL Pruett, MA Clark, SE Taranto, "Deceased organ donors and PHS risk identification: impact on organ usage and outcomes," *Transplantation,* 101 (7), 2017, 1670–8, https://doi.org/10.1097/tp.0000000000001716.
[33] OPTN Ad Hoc Disease Transmission Advisory Committee, "Clarify Informed Consent Policy for Transmittable Conditions," Briefing Paper to OPTN Board of Directors, June 2018, available at https://optn.transplant.hrsa.gov/media/2525/DTAC_BoardReport_201806.pdf.

practices, the CDC ex-officio DTAC member explained that CDC did not want to be too prescriptive regarding this requirement. [34,35]

4. Recipient testing and reporting

- Add specific timing and testing type requirements for candidate pre-transplant testing of HIV, HBV, and HCV (during hospital admission for transplant but before transplant)
- Add universal post-transplant testing for all recipients, regardless of donor risk criteria
    - HIV, HBV, and HCV NAT testing at four to eight weeks post-transplant
    - HBV NAT testing at eleven to thirteen months post-transplant for liver recipients

PHS Workgroup and DTAC Rationale: The 2020 *Guideline* proposes universal post-transplant recipient testing for HIV, HBV, and HCV at four to six weeks, in order to detect, and if needed, begin treatment, as early as possible, an unexpected transmission of HIV, HBV, or HCV from the donor to the recipient. WG members, in particular transplant program representatives, requested allowing more time to acquire testing in OPTN policy. DTAC supported the suggestion to extend the time frame to eight weeks to provide a more realistic window to obtain the testing. For the requirement to test liver recipients for HBV at one year post-transplant, the WG suggested and DTAC agreed to propose a more realistic timeframe, eleven to thirteen months, to allow for logistical and operational factors that may influence timing of obtaining testing. The decision to slightly extend the timeframes would not impact the efficacy of early identification and treatment nor would it impact patient safety, based on current data that unexpected HCV and HBV impact a relatively small minority of the transplant population. From 2014-2017, there were unexpected transmissions for HCV from 9 donors into 20 recipients and for HBV from 7 donors into 7 recipients out of a total of 61,900 donors and 128,894 recipients during those years. These recipients who acquired infection did well despite not being identified for HCV until 20-195 days and for HBV until 119 to 459 days post-transplant.[36] The Committee believes that this recommendation is consistent with the 2020 *Guideline*.

HBV Vaccination: The 2020 *PHS Guideline* includes a recommendation that transplant programs vaccinate all candidates for HBV prior to transplant. This vaccine would reduce the transmission of HBV from a donor to the candidate. WG and DTAC members strongly support the CDC's recommendation for recipient HBV vaccination. They also noted that a vaccination requirement should not interfere with a candidate's ability to receive organ offers or transplant. This proposal would require transplant programs to assess the need for HBV vaccination. This proposal would also require transplant programs to report to the OPTN if HBV vaccination cannot be initiated or completed prior to transplant. The OPTN will require this data collection to assess HBV vaccination and immunity status. Currently the OPTN does collect data on recipient results for surface antibody testing (HBsAb). HBV infection can result in graft failure and HBV is a preventable infectious disease.

The proposed data collection is consistent with the CDC recommendation that all recipients receive HBV vaccination. Data collection on candidate HBV vaccination will offer insights on how many transplant programs are following the 2020 *Guideline* and whether there is a noticeable difference in infection transmission between vaccinated and unvaccinated recipients. These data are needed to assist with monitoring the preventable infectious disease spread of HBV. Public comment feedback is being sought on this topic.

5. Collection and storage of donor and recipient specimens

[34] ML Volk, "The 'PHS increased risk' label'".
[35] TL Pruett, "Deceased organ donors and PHS risk identification".
[36] D Bixler, "Hepatitis B and C virus infections".

- Add requirement for living donor recovery hospitals to store specimens to ten years, the same requirement currently in place for OPOs and deceased donor specimen storage.
- Add OPO requirement to gather specimen for storage within 24 hours of organ procurement.
- Add living donor recovery hospital requirement to gather specimen for storage within 24 hours of organ recovery.

PHS Workgroup and DTAC Rationale: The revised *PHS Guideline* advises that OPO and living donor recovery hospitals store donor blood specimens for at least ten years. Two specimens (one for NAT and one for serology) should be collected within 24 hours before organ procurement/recovery. While the current *Guideline* recommends and OPTN policy already requires OPOs to store specimens for 10 years, the WG members raised significant concerns about the need to store living donor specimen for ten years. During meeting discussions, the CDC ex-officio DTAC member stressed the need to do this to support investigation into reported unexpected disease transmissions. Concerns from transplant hospital representatives include the additional capacity, cost, and logistics of storing more specimens for a longer duration. In addition, some on the WG noted that ten years in not necessary for detection of HIV, HBV, or HCV but may make sense as part of another type of recommendation separate from this topic. Overall, the WG supports including storage for some duration, but did not have consensus on the appropriate timeframe, as their opinions ranged between two years versus the requested ten years.[37] The DTAC did not express these same concerns and proposed including the ten year living donor storage requirement in policy, but is also requesting specific feedback on this issue during public comment. [38]

In addition to policy language revisions, additional follow up solutions may be considered after this proposal is approved:

- Guidance for OPTN members and patients
- Educational webinars or other media products
- Informative Frequently Asked Questions (FAQ) website page
- Additional or changed donor and recipient collection in UNet[SM]
- Additional items may potentially require subsequent public comment

NOTA and Final Rule Analysis

This proposal revises OPTN policies to be in alignment with the most up to date PHS recommendations. The OPTN Final Rule requires the OPTN to develop policies that are "consistent with recommendations of the Centers for Disease Control and Prevention, for the testing of organ donors and follow-up of transplant recipients to prevent the spread of infectious diseases."[39] The recommendations in this proposal are consistent with the recommendations in the 2020 *PHS Guideline*, as they are either identical or substantively consistent with those recommendations. The proposed vaccination assessment is authorized by §121.5(a) of the OPTN Final Rule. The proposed data collection related to HBV vaccination is considered to be under the authority of §121.11(b)(2) of the OPTN Final Rule which states that "An organ procurement organization or transplant hospital shall, as specified from time to time by the Secretary, submit to the OPTN…information regarding transplant candidates, transplant recipients, [and] donors of organs…."[40]

[37] OPTN DTAC PHS Workgroup Meetings, July 2, 8, and 14, 2020. Minutes available upon request.
[38] OPTN DTAC Meeting, July 15, 2020, Meeting Summary, available at (hyperlink pending)
[39] "Organ Procurement and Transplantation Network," *Code of Federal Regulations*, Title 42 (2019): 806-807. https://www.govinfo.gov/content/pkg/CFR-2019-title42-vol1/pdf/CFR-2019-title42-vol1.pdf.
[40] 42 CFR §121.11(b)(2).

Implementation Considerations

Member and OPTN Operations

Operations affecting Transplant Hospitals

Additional living donor, candidate and recipient testing may require additional visits, time, cost, and data entry. Modification of time intervals for testing and recipient follow-up may change workflow.

Living donor recovery hospitals must arrange for additional storage for living donor specimens. This will require additional storage space, and development of storage protocols.

Modifications to living donor, candidate, and recipient testing may require modifications to medical record systems, particularly for transplant specific modules.

Transplant hospitals will need to assess candidates for the need for HBV vaccination and report data regarding reasons that HBV vaccination cannot be completed or initiated prior to transplant.

Hospitals must also educate staff on changed criteria and changed risk discussion.

Operations affecting Organ Procurement Organizations

OPOs will need to modify their donor screening questions and documentation for identifying donors that have any risk criteria. This may involve programming changes to their medical record systems and changes to data collection and reporting.

Additional testing and documentation in shorter timeframes may require additional communication with transplant programs.

Repeat NAT tests may be needed for donors if procurement does not occur within the 96 hour window of when infectious disease samples were first drawn. If samples need to be redrawn, these test results may not be available at the time of transplant.

Staff education on the revised screening questions, operational, and documentation changes will be needed.

Operations affecting Histocompatibility Laboratories

This proposal is anticipated to minimally affect the operations of Histocompatibility Laboratories. Since there are no changes in histocompatibility testing, any changes would affect labs that perform infectious disease testing and/or archive donor blood specimens for transplant members. Specifically, the requirement that donor specimens tested for HIV, HBV and HCV be collected within 96 hours of organ procurement may result in donors needing to be retested if the donation process exceeds the 96 hour timeframe. Additionally, the requirement that donor specimens for archive be collected within 24 hours before organ procurement may mean that additional sample(s) be obtained and processed to meet this requirement. It is minimal, but is an additional step to normal workflow.

Operations affecting the OPTN

The OPTN and the CDC will create a joint effort to provide community education about the changes.

This proposal will require programming in UNet[SM]. The programming for this proposal will be a medium effort.

- Terminology for "Increased Risk Donor" will be removed from programming.
- Other data fields used for risk identification of the donor will be updated to align with policy.
- Data collection will be required related to recipient HBV vaccination.
- Modifications to recipient registration and follow up forms may be needed.
- Labeling adjustments will need to be made for extra vessels.

Potential Impact on Select Patient Populations

This proposal will affect all potential organ donors, both living and deceased, and any organ transplant candidates receiving offers for donor organs.

This proposal is expected to enhance patient safety for recipients of all donor organs by aligning transplant policy with new recommendations from the PHS regarding the evaluation and testing of living and deceased donors, as well as transplant candidates and recipients.

Projected Fiscal Impact

Projected Impact on Organ Procurement Organizations

There may be costs associated with repeat NAT testing within 96 hours of procurement time. Staff training and updated protocol may be a one-time cost.

Projected Impact on Transplant Hospitals

There will be costs associated with universal testing (HIV, HCV, HBV) of all recipients, and it should be covered by the recipient's insurance. Insurers may not cover costs for HIV, HBV, and HCV unless there is a reason to test for it post-transplant. Staff training, protocol development, and changes to hospital systems of medical record management may also be one-time cost.

Living donor specimen storage cost would be required for ten years. There is a one-time storage cost per specimen, in addition to any costs associated with storage per unit and development of storage protocol (staff time and additional lab supplies). The cost will vary be transplant volume.

Projected Impact on Histocompatibility Laboratories

Any changes would minimally affect labs that perform infectious disease testing and/or archive donor blood specimens for OPOs. Specifically, the requirement that donor specimens tested for HIV, HBV and HCV are required to be collected within 96 hours of organ procurement may result in donors needing to be retested if the donation process exceeds the 96 hour timeframe. Any necessary retesting would incur an additional minimal cost, potentially delay procurement, and change allocation if the test results change.

Projected Impact on the OPTN

The programming effort will be medium for this proposal although some of the data needs and changes are still under evaluation. The OPTN may implement this proposal in phases. Education will be provided

to members regarding the changes. The OPTN is collaborating with the CDC as this organization also has community and patient education plans.

Post-implementation Monitoring

Member Compliance

In addition to the monitoring described below, the OPTN Contractor may review any data entered in UNet[SM] and compliance with any OPTN policy or bylaws. Members must provide supporting documentation as requested.

OPO monitoring

Policy 2.2 OPO Responsibilities: Site surveyors will continue to review a sample of deceased donor records to verify that blood specimen archiving is noted in the donor chart. Based on the proposed policy change, surveyors will verify that the collection date of the archived blood specimens is no earlier than 1 day prior to the donor's recovery date.

Policy 2.4 Deceased Donor Medical and Behavioral History: Site surveyors will continue to review a sample of deceased donor records to verify:

- That the OPO assessed the donor for risk of acute HIV, HBV, or HCV infection according to the criteria in the *U.S. PHS Guideline*
- If risk factors are identified, that the OPO communicated this information to all receiving transplant programs

Policy 2.5 Hemodilution Assessment: Based on the proposed policy change, site surveyors will no longer verify that an OPO reported a donor as having an increased risk of HIV, HBV, or HCV transmission because HIV, HBV, or HCV testing was performed using a hemodiluted specimen. Site surveyors will continue to review a sample of deceased donor records to verify:

- The calculations used to assess hemodilution
- The date and time of the blood draw for the blood used for the screening tests
- The date and time of the blood draw used to determine hemodilution
- If the donor specimens are hemodiluted, that the following were communicated to the accepting transplant programs:
    - Any screening results from the hemodiluted specimens
    - The tests completed on the hemodiluted specimens
    - The hemodilution calculation used for the hemodiluted specimens, if requested

Policy 2.9 Required Deceased Donor Infectious Disease Testing: Site surveyors will continue to review a sample of deceased donor records to verify that the required infectious disease tests have been performed, and that the results of the tests reported in UNet are consistent with source documentation. Based on the proposed policy changes, surveyors will:

- Verify that an HIV ribonucleic acid (RNA) screening or diagnostic nucleic acid test (NAT) was performed
- Verify that an HBV deoxyribonucleic acid (DNA) screening or diagnostic NAT was performed
- Verify that samples used for all required HIV, HBV, and HCV tests were drawn no earlier than 4 days prior to the donor recovery date

Living donor recovery hospital monitoring

Policy 14.1.A Living Donor Psychosocial Evaluation Requirements: Site surveyors will continue to review a sample of living donor medical records for documentation that the donor psychosocial evaluation was completed and addressed the elements required in policy. This includes verifying that the recovery hospital assessed the donor for risk of acute HIV, HBV, or HCV infection according to the criteria in the *U.S. PHS Guideline*.

Policy 14.4.A Living Donor Medical Evaluation Requirements: Site surveyors will continue to review a sample of living donor medical records for documentation that the medical evaluation of the donor included an assessment of risk criteria for acute HIV, HBV, or HCV infection according to the *U.S. PHS Guideline*. Surveyors will also continue to review a sample of living donor medical records to verify that required infectious disease tests have been performed, and that required HIV, HBV, and HCV tests have been performed no earlier than 28 days prior to the donor's recovery date. Based on the proposed policy changes, surveyors will:

- Verify that an HIV ribonucleic acid (RNA) nucleic acid test (NAT) was performed
- Verify that an HBV deoxyribonucleic acid (DNA) NAT was performed

Proposed *Policy 14.8.B Living Donor Specimen Collection and Storage*: Based on the proposed policy, site surveyors will review a sample of living donor medical records to verify that blood specimen archiving is noted in the donor chart, and that the collection date of the archived blood specimens is no earlier than 1 day prior to the donor's recovery date.

Transplant hospital monitoring

Proposed *Policy 15.2 Candidate Pre-Transplant Infectious Disease Reporting and Testing Requirements:* Based on the proposed policy changes, site surveyors will review a sample of medical records to verify that the candidate was tested for HIV, HBV, and HCV via the tests specified in this policy, using blood samples collected during hospital admission for transplant and prior to first anastomosis. If the candidate was not tested for HIV, HBV, or HCV because the candidate was known to be positive for that viral infection prior to hospital admission for transplant, site surveyors will request documentation of the candidate's known positive status for that infection.

Policy 15.3.B Donors with Risk Identified Pre-Transplant: Based on the proposed policy changes, site surveyors will review a sample of medical records for documentation that the transplant program informed the intended recipient or recipient's agent after the organ offer but before transplant that an assessment of the donor for risk criteria for acute HIV, HBV, or HCV infection according to the *U.S. PHS Guideline* identified the presence of one or more risk criteria in the donor. Surveyors will no longer verify that the transplant program obtained informed consent from a potential recipient or recipient's agent when a donor met risk criteria according to the *U.S. PHS Guideline*, or when hemodiluted specimens were used for donor HIV, HBV, or HCV testing.

Proposed *Policy 15.3.C Required Post-Transplant Infectious Disease Testing*: Based on the proposed policy changes, site surveyors will review a sample of medical records to verify that the recipient was tested for HIV, HBV, and HCV between 28 and 56 days after the date of transplant using HIV RNA NAT, HBV DNA NAT, and HCV RNA NAT. If the recipient was not tested for HIV, HBV, or HCV because the recipient was known to be positive for that viral infection, site surveyors will request documentation of the recipient's known positive status for that infection.

Policy Evaluation

This policy will be formally evaluated approximately 1 year and 2 years post-implementation.

The following metrics, and any others subsequently requested by the Committee, will be evaluated as data become available to compare performance before and after the implementation of this policy:

- The number/percent of 'donors with risk factors for HIV, HBV and HCV' by donor type.
- The number/percent of living donors reporting HBV and HIV NAT test, overall and by organ (kidney and liver) and 'donor with risk factors for HIV, HBV and HCV' status.
- For living donors reporting HBV and HIV NAT test results, the number/percent by test result and organ and 'donor with risk factors for HIV, HBV and HCV' status.
- The number/percent of recipients receiving an HIV, HBV and HCV NAT testing post-transplant, as reported on the TRR, by 'donor with risk factors for HIV, HBV and HCV' and infectious disease test result.
- HBV NAT test results for liver recipients at one-year post-transplant by 'donor with risk factors for HIV, HBV and HCV' status and test results.
- Deceased donor organ utilization rates pre and post-policy by 'donor with risk factors for HIV, HBV, and HCV' status and organ.
- One-year unadjusted graft and patient survival rates pre and post-policy by 'donor with risk factors for HIV, HBV, and HCV' status and organ.

Conclusion

The *PHS Guideline* and aligned OPTN policy exist to help prevent transmission of HIV, HBV, and HCV from organ donors. The proposal changes intend to increase the number of transplants by contracting language that may have prevented low risk organs from being transplanted, as evidence demonstrates in this proposal. While criteria is proposed to be overall less restrictive, additional testing, documentation of potential risk, and longer storage of specimen are safeguards to continue to maintain a very low rate of unexpected disease transmission. The policy language aligns policy to CDC recommendations, as required by the Final Rule.[41]

Overall feedback on this proposal, in addition to the following specific topics, is requested:

1. Data collection related to HBV immunity status may be expanded to include more specific information on HBV vaccination status and barriers to completion. Feedback is requested on the feasibility of and support for collecting additional data related to HBV vaccination status.
2. What is the appropriate length of time to require living donor specimens be stored by recovery hospitals? Why?
3. In order to evaluate the effectiveness of the revised *PHS Guideline*, reporting of additional specific risk criteria by OPOs would be needed. Feedback is sought on the feasibility of reporting additional specific risk criteria.
4. Hemodilution was removed from the PHS risk criteria for 2020. Please comment on whether hemodilution should remain in policy.
5. Please comment on the post-transplant testing requirements in policy, as part of this proposal:
    - HIV, HBV, and HCV NAT testing at four to eight weeks post-transplant
    - HBV NAT testing at eleven to thirteen months post-transplant for liver recipients

[41] "Organ Procurement and Transplantation Network," *Code of Federal Regulations*, Title 42 (2019): 806-807. https://www.govinfo.gov/content/pkg/CFR-2019-title42-vol1/pdf/CFR-2019-title42-vol1.pdf.

Policy and/or Bylaws Language

Proposed new language is underlined (example) and language that is proposed for removal is struck through (~~example~~). Heading numbers, table and figure captions, and cross-references affected by the numbering of these policies will be updated as necessary.

1.2 Definitions:

Hepatitis B Virus (HBV)
Hepatitis B is a vaccine-preventable liver infection caused by the hepatitis B virus (HBV).

Hepatitis C Virus (HCV)
Hepatitis C is a liver infection caused by the hepatitis C virus (HCV).

Human Immunodeficiency Virus (HIV)
Human Immunodeficiency Virus (HIV) is a virus that attacks the body's immune system. If HIV is not treated, it can lead to Acquired Immunodeficiency Syndrome (AIDS).

United States (U.S.) Public Health Service (PHS) Guideline
~~The *PHS Guideline for Reducing Human Immunodeficiency Virus (HIV), Hepatitis B Virus (HBV), and Hepatitis C Virus (HCV) through Organ Transplantation* (2013).~~

The Guideline issued by the U.S. Public Health Service in 2020 that provides recommendations for organ transplantation related to Human Immunodeficiency Virus (HIV), Hepatitis B Virus (HBV), and Hepatitis C Virus (HCV) transmission.

2.2 OPO Responsibilities

15. Maintaining blood specimens appropriate for serologic and nucleic acid testing (NAT), as available, for each deceased donor for at least 10 years after the date of organ transplant, and ensuring these samples are available for retrospective testing. The samples must be collected within 24 hours prior to organ procurement. The host OPO must document the type of sample in the deceased donor medical record and, if possible, should use qualified specimens.

2.4 Deceased Donor Medical and Behavioral History

2. Whether the potential deceased donor has any risk factors associated with ~~an increased risk for~~ disease transmission, including blood-borne pathogens. If the deceased donor ~~meets the~~ has any risk criteria for ~~increased risk for~~ acute HIV, ~~Hepatitis B~~ HBV, ~~and~~ or ~~Hepatitis C transmission~~ HCV infection ~~as set forth in~~ according to the ~~current~~ *U.S. Public Health Service~~s~~ (PHS) Guideline* ~~or the host OPO cannot obtain the information necessary to make this determination,~~ the host OPO must ~~identify the donor as having increased risk for transmission of HIV, Hepatitis B, and Hepatitis C and~~ communicate this information to all transplant programs receiving organs from the deceased donor.

2.5 Hemodilution Assessment

OPOs must use qualified (non-hemodiluted) blood samples for deceased donor ~~serological~~ screening tests if available. If a qualified sample is not available for testing, a hemodiluted sample may be used for

deceased donor screening tests.

~~If serological testing occurs on a hemodiluted blood sample, the host OPO must treat the deceased donor as presenting an increased risk for disease transmission as specified in the U.S. Public Health Services (PHS) Guideline.~~

Prior to screening, the host OPO must assess all potential deceased donor blood samples that were obtained for ~~serological~~ screening tests for hemodilution using a U.S. Food and Drug Administration (FDA) approved hemodilution calculation. The host OPO must document in the deceased donor medical record a complete history of all blood products and intravenous fluid transfusions the deceased donor received since admission to the donor hospital.

Additionally, the host OPO must report *all* of the following to the accepting transplant programs when a hemodiluted specimen is used in deceased donor screening tests:

1. Any screening results from the hemodiluted specimens.
2. The tests completed on the hemodiluted specimens.
3. The hemodilution calculation used for the hemodiluted specimens, if requested.

2.7.A Exceptions to HIV Screening Requirement

Exceptions to the HIV screening requirement may be made for organs *other than* kidneys, when, in the medical judgment of the host OPO and recipient transplant hospital or OPO, an extreme medical emergency warrants the transplantation of an organ that has not been tested for HIV.

In this case the host OPO must do *both* of the following:

1. Provide all available deceased donor medical and social history to the transplant program.
2. Treat the deceased donor as having ~~an increased~~ any risk criteria for ~~disease transmission~~ acute HIV, HBV or HCV infection ~~based on current~~ according to the *U.S. Public Health Service~~s~~ (PHS) Guideline*.

In this case the receiving transplant hospital must:

- ~~Obtain and document informed consent from~~ Inform the potential transplant recipient or the recipient's authorized agent before transplantation according to *Policy 15.3.B: Donors with Risk Identified Pre-Transplant*
- Obtain HIV screening test results prior to storing, sharing, or using the extra vessels in another recipient, according to *Policy 16.6: Extra Vessels Transplant and Storage*

2.9 Required Deceased Donor Infectious Disease Testing

The host OPO is responsible for ensuring that *all* of the following infectious disease testing is completed in CLIA-certified laboratories, or in laboratories meeting equivalent requirements as determined by the Centers for Medicare and Medicaid Services (CMS):

1. Blood and urine cultures

2. Infectious disease testing for all potential deceased organ donors using FDA licensed, approved or cleared tests, as listed below:
   a. HIV antibody (anti-HIV) donor screening test or HIV antigen/antibody (Ag/Ab) combination test
   b. HIV ribonucleic acid (RNA) by donor screening or diagnostic nucleic acid test (NAT)
   c. Hepatitis B surface antigen (HBsAg) donor screening test
   d. Hepatitis B core antibody (anti-HBc) donor screening test
   e. Hepatitis B deoxyribonucleic acid (DNA) by donor screening or diagnostic nucleic acid test (NAT)
   f. Hepatitis C antibody donor screening test (anti-HCV)
   g. Hepatitis C ribonucleic acid (RNA) by donor screening or diagnostic nucleic acid test (NAT)
   h. Cytomegalovirus (CMV) antibody (anti-CMV) donor screening or diagnostic test
   i. Epstein-Barr Virus (EBV) antibody (anti-EBV) donor screening or diagnostic test
   j. Syphilis donor screening or diagnostic test
   k. Toxoplasma Immunoglobulin G (IgG) antibody test
3. ~~If the donor is identified as being at increased risk for HIV, HBV, and HCV transmission according to *the U.S. Public Health Services (PHS) Guideline*. HIV RNA by donor screening or diagnostic NAT or HIV antigen/antibody (Ag/Ab) combination is *also* required unless *either* of the following is true:~~
   - ~~The donor has already been tested for HIV using the HIV Ag/Ab combination test according to section 2.a above.~~
   - ~~The donor's only increased risk factor is having received hemodialysis within the past 12 months.~~

   Donor samples for all required HIV, HBV, and HCV testing must be obtained within 96 hours prior to organ procurement.

13.11 Receiving and Accepting KPD Match Offers

Each OPTN KPD program must designate a KPD contact to receive notification of match offers.

Table 13-4: Deadlines for Performing Responsibilities upon Receiving a KPD Match Offer

The following members:	Must:	Within:
Each transplant hospital receiving a match offer	Report to the OPTN Contractor a preliminary response	2 business days of receiving the match offer.
The matched candidate's transplant hospital and the matched donor's transplant hospital	Agree in writing upon all of the following: • Contents required in the crossmatch kit • Instructions for the donor • Address at which to send the completed blood samples	4 business days of receiving the match offer.
The matched donor's transplant hospital	Report to the OPTN Contractor the agreed upon date of the crossmatch	4 business days of receiving the match offer.

The following members:	Must:	Within:
The matched donor's transplant hospital	Make all of the following matched donor's records accessible to the matched candidate's transplant hospital: • Any serologic and nucleic acid testing (NAT) results that have not already been shared with the matched candidate's transplant hospital • Whether the matched donor ~~is increased risk~~ has any risk criteria for acute HIV, HBV, or HCV infection according to the *U.S. Public Health Service~~s~~ (PHS) Guideline* • Additional records requested by the matched candidate's transplant hospital	4 business days of receiving the match offer.
The matched candidate's transplant hospital	Report to the OPTN Contractor the results of the crossmatch	15 business days of receiving the match offer.
The matched candidate's transplant hospital	Review the matched donor's records and confirm acceptance or report a refusal of the match offer to the OPTN Contractor	15 business days of the match offer.

If the matched candidate's and matched donor's transplant hospitals do not meet any of the deadlines above, then the exchange will be terminated unless a transplant hospital requests an extension. If a transplant hospital submits an extension request before the deadline, the exchange will not terminate until the resolution of the extension request or the deadline is reached, whichever comes last.

14.1.A Living Donor Psychosocial Evaluation Requirements

Living donor psychosocial evaluation requirements apply to living kidney, liver, pancreas, lung, and intestine donors.

The living donor psychosocial evaluation must be performed by a psychiatrist, psychologist, masters prepared social worker, or licensed clinical social worker prior to organ recovery. Documentation of the psychosocial evaluation must be maintained in the living donor medical record and include *all* of the following components:

1. An evaluation for any psychosocial issues, including mental health issues, that might complicate the living donor's recovery and could be identified as risks for poor psychosocial outcome.
2. An ~~evaluation for the presence of behaviors that may increase~~ assessment of risk criteria for ~~disease transmission~~ acute HIV, HBV, and HCV infection ~~as defined by~~ according to the *U.S. Public Health Service (PHS) Guideline.*

3. A review of the living donor's history of smoking, alcohol, and drug use, including past or present substance abuse disorder.
4. The identification of factors that warrant educational or therapeutic intervention prior to the final donation decision.
5. The determination that the living donor understands the short and long-term medical and psychosocial risks for both the living donor and recipient associated with living donation.
6. An assessment of whether the decision to donate is free of inducement, coercion, and other undue pressure by exploring the reasons for donating and the nature of the relationship, if any, to the transplant candidate.
7. An assessment of the living donor's ability to make an informed decision and the ability to cope with the major surgery and related stress. This includes evaluating whether the donor has a realistic plan for donation and recovery, with social, emotional and financial support available as recommended.
8. A review of the living donor's occupation, employment status, health insurance status, living arrangements, and social support.
9. The determination that the living donor understands the potential financial implications of living donation.

14.4.A Living Donor Medical Evaluation Requirements

Living donor medical evaluation requirements only apply to living kidney, liver, pancreas, lung or intestine donors.

A medical evaluation of the living donor must be performed by the recovery hospital and by a physician or surgeon experienced in living donation. Documentation of the medical evaluation must be maintained in the donor medical record.

The medical evaluation must include *all* of the components in *Tables 14-5* through *14-8* below.

Table 14-5: Requirements for Living Donor Medical Evaluations

This evaluation must be completed:	Including evaluation for and assessment of this information:
General donor history	1. A personal history of significant medical conditions which include but are not limited to: a. Hypertension b. Diabetes c. Lung disease d. Heart disease e. Gastrointestinal disease f. Autoimmune disease g. Neurologic disease h. Genitourinary disease i. Hematologic disorders j. Bleeding or clotting disorders k. History of cancer including melanoma

This evaluation must be completed:	Including evaluation for and assessment of this information:
	2. History of infections 3. Active and past medications with special consideration for known nephrotoxic and hepatotoxic medications or chronic use of pain medication 4. Allergies 5. An evaluation for coronary artery disease
General family history	• Coronary artery disease • Cancer
Social history	• Occupation • Employment status • Health insurance status • Living arrangements • Social support • Smoking, alcohol and drug use and abuse • Psychiatric illness, depression, suicide attempts • ~~Increased risk behavior~~ Risk criteria for acute HIV, HBV, and HCV infection ~~as defined by~~ according to the *U.S. Public Health Service~~s~~ (PHS) Guideline*
Physical Exam	• Height • Weight • BMI • Vital signs • Examination of all major organ systems
General laboratory and imaging tests	• Complete blood count (CBC) with platelet count • Blood type and subtype as specified in 14.5: Living Donor Blood Type Determination and Reporting and its subsections • Prothrombin Time (PT) or International Normalized Ratio (INR) • Partial Thromboplastin Time (PTT) • Metabolic testing (to include electrolytes, BUN, creatinine, transaminase levels, albumin, calcium, phosphorus, alkaline phosphatase, bilirubin) • HCG quantitative pregnancy test for premenopausal women without surgical sterilization • Chest X-Ray • Electrocardiogram (ECG)
Transmissible disease screening	Infectious disease testing must be performed in a CLIA-certified laboratory or in a laboratory meeting equivalent requirements as determined by Centers for Medicare and Medicaid Services (CMS) using FDA-licensed, approved, or cleared tests. Testing must include *all* the following: 1. CMV (Cytomegalovirus) antibody 2. EBV (Epstein Barr Virus) antibody

This evaluation must be completed:	Including evaluation for and assessment of this information:
	3. HIV antibody (anti-HIV) testing or HIV antigen/antibody (Ag/Ab) combination test as close as possible, but within 28 days prior to organ recovery 4. HIV ribonucleic acid (RNA) by nucleic acid test (NAT) as close as possible, but within 28 days prior to organ recovery 5. Hepatitis B surface antigen (HBsAg) testing as close as possible, but within 28 days prior to organ recovery 6. Hepatitis B core antibody (anti-HBc) testing as close as possible, but within 28 days prior to organ recovery 7. HBV deoxyribonucleic acid (DNA) by nucleic acid test (NAT) as close as possible, but within 28 days prior to organ recovery 8. Hepatitis C antibody (anti-HCV) testing as close as possible, but within 28 days prior to organ recovery 9. HCV ribonucleic acid (RNA) by nucleic acid test (NAT) as close as possible, but within 28 days prior to organ recovery 10. Syphilis testing ~~If a living donor is identified as being at increased risk for HIV, HBV, and HCV transmission according to the *U.S. Public Health Services (PHS) Guideline*, testing must also include HIV ribonucleic acid (RNA) by NAT or HIV antigen/antibody (Ag/Ab) combination test. This does not apply to donors whose only increased risk factor is receiving hemodialysis within the preceding 12 months, as they are at risk only for HCV according to the *U.S. Public Health Services (PHS) Guideline.*~~ For tuberculosis (TB), living donor recovery hospitals must determine if the donor is at increased risk for this infection. If TB risk is suspected, testing must include screening for latent infection using *either*: • Intradermal PPD • Interferon Gamma Release Assay (IGRA)
Endemic transmissible diseases	Each living donor hospital must develop and follow a written protocol for identifying and testing donors at risk for transmissible seasonal or geographically defined endemic disease as part of its medical evaluation.
Cancer screening	Recovery hospitals must develop and comply with protocols consistent with the American Cancer Society (ACS) or the U.S. Preventive Services Task Force to screen for: • Cervical cancer • Breast cancer • Prostate cancer • Colon cancer • Lung cancer

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14.8.B Living Donor Specimen Collection and Storage

The recovery hospital must obtain specimens appropriate for serological and NAT testing within 24 hours prior to organ recovery. The recovery hospital is responsible for arranging storage of these specimens for at least 10 years after the date of transplant and ensuring these samples are available for retrospective testing. The recovery hospital must document the type of sample in the living donor medical record.

14.9.B Psychosocial and Medical Evaluation Requirements for Domino and Non-Domino Therapeutic Donors

Recovery hospitals must evaluate domino donors and non-domino therapeutic donors according to *all* of the following requirements:

1. Perform an ~~evaluation for the presence of behaviors that may increase risk for disease transmission~~ assessment for risk criteria for acute HIV, HBV, and HCV infection ~~as defined by~~ according to the *U.S. Public Health Service (PHS) Guideline*
2. Screen the domino donor or non-domino therapeutic donor for all of the following according to *Policy 14.4: Medical Evaluation Requirements for Living Donors*, *Table 14-5: Requirements for Living Donor Medical Evaluations*:
   a. Transmissible diseases screening
   b. Endemic transmissible diseases
   c. Cancer screening
3. Develop and comply with written protocols for the domino donor and non-domino therapeutic donor exclusion criteria considering incorporating as appropriate the elements of *Table 14-8: Living Donor Exclusion Criteria*
4. Register and verify the blood type of the domino donor or non-domino therapeutic donor according to *Policy 14.5: Registration and Blood Type Verification of Living Donors before Donation*

Documentation of the psychosocial and medical evaluation must be maintained in the donor medical record.

15.2 ~~Potential~~ Candidate ~~Screening~~ Pre-Transplant Infectious Disease Reporting and Testing Requirements

As part of the candidate's medical evaluation, an assessment for the need to provide HBV vaccination must occur. If the transplant program determines that vaccination cannot be initiated or completed due to timing related to transplant, medical contraindication, or other reasons in the transplant program's medical judgment, the reason for not initiating or completing HBV vaccination must be documented in the candidate's medical record and reported to the OPTN.

To be eligible for an organ transplant, ~~potential~~ transplant candidates must be tested for:

1. ~~human immunodeficiency virus (~~HIV~~)~~ using a CDC recommended laboratory HIV testing algorithm
2. ~~hepatitis B,~~ Hepatitis B surface antigen (HBsAg)
3. Hepatitis B core antibody (anti-HBc)

4. Hepatitis B surface antibody (HBsAb)
5. ~~and hepatitis C,~~ Hepatitis C antibody (anti-HCV)
6. Hepatitis C ribonucleic acid (RNA) by nucleic acid test (NAT)

unless the testing would violate state or federal laws.

Infectious disease testing must be performed in a CLIA-certified laboratory or in a laboratory meeting equivalent requirements as determined by Centers for Medicare and Medicaid Services (CMS) using FDA-licensed, approved, or cleared tests.

Candidate samples must be drawn during the hospital admission for transplant but prior to anastomosis of the first organ.

If the candidate is known to be infected with HIV, HBV, or HCV, then testing for the known viral infection or infections is not required, however the other tests required according to this policy must still be performed.

~~Potential c~~Candidates who test positive for HIV, hepatitis B, or hepatitis C must be offered appropriate counseling.

The OPTN permits HIV test positive individuals as organ candidates if permitted by the transplant hospital. Care of HIV test positive organ candidates and recipients must not deviate from general medical practice.

15.3.B Donors with Risk Identified Pre-Transplant

Transplant programs must meet the requirements according to *Table 15-1* below when the deceased or living donor has risk of disease transmission identified pre-transplant.

Table 15-1: Requirements for Donors with Risk Identified Pre-Transplant

Each time any of the following occurs:	Then transplant programs must do *all* of the following:
• The donor tests positive for *any* of the following: a. Hepatitis B surface antigen (HBsAg) b. Hepatitis B nucleic acid test (NAT) c. Hepatitis C NAT ~~• The donor meets any of the criteria for increased risk of transmitting HIV, hepatitis B, or hepatitis C, as specified in the *U.S. Public Health Services (PHS) Guideline*~~ ~~• A hemodiluted specimen is used for the donor HIV, hepatitis B, or hepatitis C testing, according to *Policy 2.5: Hemodilution Assessment*~~ • The donor tests positive for HIV antibody (anti-HIV), HIV antigen/antibody (Ag/Ab), or HIV NAT, and the transplant hospital participates in an approved variance according to *Policy 15.7: Open Variance for the Recovery and Transplantation of Organs from HIV-positive Donors*	1. Explain the risks and obtain informed consent from the intended recipient or the intended recipient's agent after the organ offer but before transplant 2. Document this consent in the intended recipient's medical record 3. Follow the recipient for the development of potential donor-derived disease after transplant
• <u>The donor has any risk criteria for acute HIV, HBV, or HCV infection according to the *U.S. Public Health Service (PHS) Guideline*</u>	<u>1. Inform the intended recipient or the intended recipient's agent after the organ offer but before transplant that risk criteria are present in the donor</u> <u>2. Document that this information was provided in the intended recipient's medical record</u>

~~Exceptions to the informed consent requirement may be made for extra vessels when,~~ <u>If</u> in the medical judgment of the transplanting physician, ~~the~~ extra vessels are required for use in an emergency transplant procedure for an organ other than the organ with which they were recovered~~. In this case~~, <u>then</u> the transplant hospital must do *both* of the following post-transplant:

1. Inform the recipient of the use of the extra vessels and <u>if the donor had any risk criteria for acute HIV, HBV, or HCV infection according to the *U.S. Public Health Service (PHS) Guideline*</u> ~~the increased risk status~~
2. Provide follow up to the recipient according to *Policy* ~~*15.3.B: Donors with Risk Identified Pre-Transplant*~~ <u>*15.3.C: Required Post-Transplant Infectious Disease Testing*</u>

15.3.C ~~Recipients of Organs from Donors with Increased Risk of Disease Transmission~~ <u>Required Post-Transplant Infectious Disease Testing</u>

1. Transplant programs must test all recipients post-transplant for: ~~develop and comply with a written protocol for post-transplant testing for HIV, hepatitis B, or hepatitis C, for recipients who receive an organ from a donor who meets any of the criteria for increased risk of transmitting HIV, hepatitis B, or hepatitis C, as specified in the *U.S. Public Health Services (PHS) Guideline*.~~

   A. HIV ribonucleic acid (RNA) by nucleic acid test (NAT)
   B. HBV deoxyribonucleic acid (DNA) by nucleic acid test (NAT)
   C. HCV ribonucleic acid (RNA) by nucleic acid test (NAT)

2. Testing must be performed on the recipient at least 28 days but no later than 56 days post-transplant.
3. If the candidate is known to be infected with HIV, HBV, or HCV, then testing for the known viral infection or infections is not required, however the other tests required according to this policy must still be performed.

4. The transplant program must offer recipients ~~of these donor organs *both* of the following:~~

~~1. Additional post-transplant testing for HIV, hepatitis B , and hepatitis C according to the transplant program's protocol~~
~~2. T~~treatment of or prophylaxis for ~~the transmissible disease~~ HIV, HBV, or HCV, when medically appropriate.

5. Transplant programs must conduct HBV NAT testing on liver recipients at least 335 days but no later than 395 days post-transplant.

16.3.D Internal Labeling of Extra Vessels

The rigid container holding the extra vessels and the outermost layer of the triple sterile barrier must each have a completed OPTN extra vessels label. The OPTN Contractor distributes standardized labels that must be used for this purpose. The internal label on the outermost layer of the triple sterile barrier must be completed using the OPTN organ tracking system. The labels must include *all* of the following information according to *Table 16-1* below.

Table 16-1: Required Information on Internal Labels for Vessels

This information must be included:	On the rigid container:	On the outermost layer of the triple sterile barrier:
1. Donor ID	●	●
2. Donor blood type	●	●
3. Donor blood subtype, if used for allocation	●	●
4. Recovery date	●	●
5. Description of the container contents	●	●

This information must be included:	On the rigid container:	On the outermost layer of the triple sterile barrier:
6. That the extra vessels are for use in organ transplantation only	●	●
7. All infectious disease testing results for *all* of the following: a. anti-HIV I/II b. HIV Ag/Ab combo c. HIV NAT d. anti-HBc e. HBsAg f. HBV NAT g. anti-HCV h. HCV NAT		●
8. Whether the extra vessels are from a donor with a positive result (NAT included) for *any* of the following: • HIV, HBV, or HCV • Anti-HBc	●	
9. Whether the extra vessels are from a donor that ~~meets the~~ has any risk criteria ~~for increased risk of transmitting~~ for acute HIV, ~~hepatitis B~~ HBV, or ~~hepatitis C~~ HCV infection, ~~as specified in~~ according to the *U.S. Public Health Service (PHS) Guideline*	●	●

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Appendix A: Crosswalk between 2013 and 2020 US Public Health Service Guidelines and OPTN Policy[1]

Note: References to OPTN Policy are subject to updates based on ongoing review for consistency with the PHS Guidelines

Recommendation Category	2013	2020	OPTN Policy
Risk assessment of living and deceased donors	• OPOs should ascertain whether any of the following 14 risk criteria were present in potential organ donors.	• OPOs should ascertain whether any of the following 10 risk criteria were present in potential organ donors.	• *2.4 Deceased Donor Medical and Behavioral History* • *14.1.A Living Donor Medical Evaluation Requirements* Current policy requires the medical and behavioral/social assessments including whether the donor would meet "increased risk" designation under the PHS Guideline. Proposed policy requires the same assessments, however the term "increased risk" is removed and the OPTN policy definition for the US PHS Guideline will be updated to use 2020 as the standard.
	Risk criteria (during the 12 months before organ procurement): 1. Sex with a person known or suspected to have HIV, HBV, or HCV infection 2. Drug injection for nonmedical reasons 3. Man who has had sex with another man 4. Incarceration (confinement in jail, prison, or juvenile correction facility) for ≥72 consecutive hours 5. Sex in exchange for money or drugs 6. Sex with a person who injected drugs for nonmedical reasons 7. Sex with a person who had sex in exchange for money or drugs 8. Unknown medical or social history 9. Child aged ≤18 months born to a mother known to be infected with or at increased risk for HIV, HBV, or HCV infection 10. Child who has been breastfed by a mother who is known to be infected with or at increased risk for HIV infection 11. Woman who has had sex with a man who has had sex with another man 12. Newly diagnosed or treated syphilis, gonorrhea, chlamydia, or genital ulcers 13. Hemodialysis 14. Hemodilution of the blood sample used for infectious disease testing	Risk criteria (during the 30 days before organ procurement): 1. Sex (i.e., any method of sexual contact, including vaginal, anal, and oral) with a person known or suspected to have HIV, HBV, or HCV infection 2. Man who has had sex with another man 3. Sex in exchange for money or drugs 4. Sex with a person who had sex in exchange for money or drugs 5. Drug injection for nonmedical reasons 6. Sex with a person who injected drugs for nonmedical reasons 7. Incarceration (confinement in jail, prison, or juvenile correction facility) for ≥72 consecutive hours 8. Child breastfed by a mother with HIV infection 9. Child born to a mother with HIV, HBV, or HCV infection 10. Unknown medical or social history	• *1.2: Definitions:* *United States Public Health Service (PHS) Guideline: The PHS Guideline for Reducing Human Immunodeficiency Virus (HIV), Hepatitis B Virus (HBV), and Hepatitis C Virus (HCV) through Organ Transplantation (2013).* Definition modified to indicate "2020" Guideline. • *2.5 Hemodilution Assessment* Current policy requires members to use the 2013 PHS Guideline to determine if a donor is considered "increased risk". Proposed policy requires the same criteria as 2020 Guideline, but continues to require Hemodilution Assessment in Policy 2.5.

[1] Adapted from TABLE2. Comparison of 2013 and 2020 U.S. Public Health Service guideline recommendations* for solid organ donor assessment and transplant recipient monitoring for human immunodeficiency virus, hepatitis B virus, and hepatitis C virus infection in Jones, JM, Kracalik, I, Levi, ME *"Assessing Solid Organ Donors and Monitoring Transplant Recipients for Human Immunodeficiency Virus, Hepatitis B Virus, and Hepatitis C Virus Infection — U.S. Public Health Service Guideline, 2020"* MMWR Recomm Rep 2020;69 (7-8) available at: https://www.cdc.gov/mmwr/volumes/69/rr/rr6904a1.htm.

This crosswalk is intended to assist transplant hospitals in comparing the 2013 PHS Guidelines and 2020 PHS Guidelines to current and proposed OPTN Policies. Use of this crosswalk is not an OPTN obligation and does not guarantee an assessment of compliance with OPTN obligations.

Recommendation Category	2013	2020	Current OPTN Policy
	• Donors with any risk criteria should be designated as IRDs for an acute HIV, HBV, and HCV infection.	• Remove any specific label (e.g., "increased risk donor") to describe donors with risk factors for acute HIV, HBV, and HCV infection.	Numerous OPTN policies and sections within reference and have requirements for "increased risk" donors: • *2.4 Deceased Donor Medical and Behavioral History* • *2.5 Hemodilution Assessment* • *2.7 HIV Screening of Potential Donors* • *2.9 Required Deceased Donor Infectious Disease Testing* • *13.11 Receiving and Accepting KPD Match Offers* • *14.4 Medical Evaluation Requirements for Living Donors* • *15.3 Informed Consent of Transmissible Disease Risk* • *16.2 Packaging and Labeling Responsibilities* Proposed policy replaces references to "increased risk donor," and instead uses terms such as "risks," "risk criteria" or "risk factors."
Living and deceased solid organ donor testing	• Test all potential organ donors (living and deceased) o HIV: anti-HIV-1/2 or HIV Ag/Ab combination assay o HBV: Anti HBc and HBsAg o HCV: NAT and anti-HCV • For IRD only, HIV NAT or HIV Ag/Ab combination	• Test all potential organ donors (living and deceased) o HIV: NAT and anti-HIV o HBV: NAT, anti-HBc, and HBsAg o HCV: NAT and anti-HCV	• *Policy 2.9 Required Deceased Donor Infectious Disease Testing* • *14.4.A Living Donor Medical Evaluation Requirements* Current policy allows HIV Ab/Ag testing. Current policy does not require HBV NAT testing. Current policy only requires either HIV NAT or HIV Ab/Ag testing on IRD donors. Proposed policy requires the same tests as 2020 Guideline including NAT testing for HIV and HBV.
	• No time frame is specified for pretransplant deceased donor testing; however, results should be available at the time of transplant.	• For deceased potential donors, the donor specimen should be collected within 96 hours before organ procurement with results of these screening tests available at the time of organ procurement.	• *Policy 2.9 Required Deceased Donor Infectious Disease Testing* Current OPTN policy does not have timelines for deceased donor infectious disease test collection or result availability. Proposed policy requires the same time frame (96 hours) for obtaining specimen as 2020 Guideline.
	• Living donors should be tested within 28 days before transplantation.	• For living potential donors, testing should be performed as close as possible to the surgery but at least within the 28 days before organ procurement.	• *14.4.A Living Donor Medical Evaluation Requirements* Current policy matches the timing requirement. No changes needed for proposed policy.
Transplant candidate informed consent	• Transplant center to obtain separate, specific informed consent from transplant candidates when donors are designated as IRDs	• When donors with one or more of the criteria as specified under Risk Assessment of Living and Deceased Donors are identified, OPOs should communicate this information to the appropriate transplant centers. Transplant centers should include this information in informed consent discussions with transplant candidates or their medical decision-makers. No separate, specific informed consent is recommended. • Transplant centers should contextualize these discussions by including that risk for undetected HIV, HBV, and HCV infection is very low but not zero; should transmission occur effective therapies are available, and accepting organs from donors with risk factors might increase the chance for survival.	• *15.3.A General Risks of Potential Malignancy or Disease Transmission* • *15.3.B Donors with Risk Identified Pre-Transplant* Current policy requires informed consent for use of IRD donor and use of hemodiluted sample for infectious disease testing. The informed consent must be done after the organ offer but before transplant and the consent must be documented in the medical record. Proposed policy removes "informed consent" and includes requirement to document informing the recipient or their agent of presence of risk (*Table 15-1: Requirements for Donors with Risk Identified Pre-Transplant*).

Recommendation Category	2013	2020	Current OPTN Policy
Recipient testing and vaccination	• Pretransplant testing of transplant candidates for HIV, HBV, and HCV infections is recommended when the donor (living or deceased) is designated as IRD or infected with HBV or HCV. o Type of assay not specified o Timing: during hospital admission for transplant but before transplant	• Pretransplant testing for HIV, HBV, and HCV infections should be conducted for all candidates, regardless of donor risk criteria. o HIV: testing algorithm§ o HBV: anti-HBc, anti-HBs, and HBsAg o HCV: NAT and anti-HCV o Timing: During hospital admission for transplant but before transplant	• *15.2 Potential Candidate Screening Requirements* Current policy only specifies that candidates must have HIV, HBV, and HCV testing to be eligible for organ transplant. It does not specify testing type or more specific timing. Proposed policy would require the same as the PHS Guideline recommendations for specific HIV, HBV, and HCV tests and timing.
	• Posttransplant testing of organ recipients for HIV, HBV, and HCV infections should be conducted when the donor (living or deceased) is designated as IRD or infected with HBV or HCV. o Type of testing is not specified. o Timing: testing should be performed at 1–3 months posttransplant for HIV, HBV, and HCV and again at 12 months for HBV.	• Posttransplant testing for HIV, HBV, and HCV infections should be conducted for all recipients, regardless of donor risk criteria. o Type of testing: NAT for HIV, HBV, and HCV o Timing: 4–6 weeks posttransplant o Clinicians caring for liver recipients should maintain heightened awareness of the potential for delayed appearance of HBV infection and consider additional testing for HBV NAT at 1 year. o Recipients who develop signs or symptoms of liver injury after transplantation should be retested for viral hepatitis.	• *15.3 Recipients of Organs from Donors with Increased Risk of Disease Transmission* Current policy does not contain specific timing or test type. It requires that the transplant program have a protocol for post-transplant testing of IRD organ recipients and to follow their own protocol. No current policy requirement exists for universal posttransplant testing (for all recipients). Proposed policy would require universal post-transplant NAT testing for HIV, HBV, or HCV at 4-8 weeks post-transplant and HBV NAT for liver recipients at 11-13 months post-transplant. The recommendations are proposed for adoption with slightly revised time frames.
	• No previous PHS guideline recommendation exists for HBV vaccination of transplant candidates.	• All organ transplant candidates should be vaccinated against HBV infection.	• No current OPTN policy. • OPTN Policy to require assessment for the need to provide HBV vaccination during candidate medical evaluation. • OPTN Policy to require reporting regarding vaccination status.
Collection and storage of donor and recipient specimens	• OPOs should consider archiving a deceased donor blood sample for 10 years.	• OPOs and living donor recovery centers should archive donor blood specimens for at least 10 years. These specimens should be collected within 24 hours before organ procurement.	• *2.2 OPO Responsibilities* OPOs are currently required to keep blood specimens for serology and NAT testing for 10 years. No OPTN policy requirement exists for living donor recovery hospitals and storage of blood specimens. Proposed policy would require living donor recovery hospitals to arrange for living donor specimen storage for 10 years. Specimens would need to be collected within 24 hours of organ recovery.
Tracking and reporting of donor-derived disease transmission events	No recommendations in this category were substantially modified from 2013 to 2020.	No recommendations in this category were substantially modified from 2013 to 2020.	• *2.12 Post Procurement Follow Up and Reporting* • *15.1 Patient Safety Contact* • *15.4 Host OPO Requirements for Reporting Post-Procurement Test Results and Discovery of Potential Disease Transmissions* • *15.5 Transplant Program Requirements for Communicating Post-Transplant Discovery of Disease or Malignancy* • *15.6 Living Donor Recovery Hospital Requirements for Reporting* • *Post-Donation Discovery of Disease or Malignancy* OPTN policies require reporting of potential donor-derived disease transmission events. This includes blood-borne illnesses as well as other infections and malignancies. No proposed changes.

OPTN

Public Comment Proposal

Modify Living Donor Policy to Include Living VCA Donors

OPTN Living Donor Committee

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Contents

Modify Living Donor Policy to Include Living VCA Donors

Affected Policies:	*14.1: Psychosocial Evaluation Requirements for Living Donors* *14.2: Independent Living Donor Advocate (ILDA) Requirements* *14.3: Informed Consent Requirements* *14.4: Medical Evaluation Requirements for Living Donors* *14.5: Living Donor Blood Type Determination and Reporting* *14.6: Placement of Living Donor Organs* *14.7: Living Donor Pre-Recovery Verification* *14.9: Requirements for Domino Donors and Non-Domino Therapeutic Donors*
Sponsoring Committee:	*Living Donor Committee*
Public Comment Period:	*August 4, 2020 – October 1, 2020*

Executive Summary

The Living Donor Committee (the Committee) is proposing to update *OPTN Policy 14: Living Donation* to include all living donors and add specific elements for living vascularized composite allograft (VCA) donors. Living VCA donation, particularly uterus donation, has been steadily rising in the U.S. since 2016. However, current OPTN living donor policy does not cover living VCA donation. The purpose of this proposal is to establish safeguards and compliance standards for living VCA donor programs. This proposal would update living donor policy to apply to all living donors, as well as add specific elements for VCA to informed consent and medical evaluation requirements. The Committee identified there are unique considerations for living VCA donors and are proposing adding VCA-specific psychosocial, surgical, and financial risks to informed consent requirements. Also, the Committee is proposing the addition of medical evaluation requirements to include transmissible disease screening and other tests specific to VCA, primarily uterus.

To inform these recommendations, the Committee established the Living Donor VCA Workgroup (the Workgroup), comprised of members from the Living Donor, VCA, and Ethics Committees as well as a living uterine donor. This proposal was developed in conjunction with the VCA Committee's related proposal, *Modify Data Collection on VCA Living Donors*, which is also being released for public comment in August 2020.[1]

The Committee is seeking public feedback on the proposed informed consent and medical evaluation tables for living VCA donors. The Committee would like to know if the proposed language is sufficiently clear enough to be incorporated into hospital protocol. Additionally, the Committee would appreciate feedback on the specific requirements that are included in the proposed language.

[1] *Modify Data Collection on VCA Living Donors*, OPTN VCA Committee, August 2020, https://optn.transplant.hrsa.gov/governance/public-comment/

Background

OPTN Policy 14: Living Donation is a list of requirements for transplant hospitals involved in living organ donor transplants. The policy includes minimum requirements for the psychosocial evaluation, informed consent, and medical evaluation of living donors. Living vascularized composite allograft (VCA) donors are not currently covered by living donor policy.

Original policy references to living donation were housed in kidney and liver specific policies and were limited to the psychosocial and medical evaluation of those donors. In 2013, a subcommittee of the Living Donor Committee (the Committee) determined that there should be minimum, common standards and protections for all living donors and a living donor specific policy section should be developed. [2]

From 2013 to 2015, the Committee worked on consolidating living donor policies into the current format and originally intended to cover all living donors. Concurrently, the OPTN Final Rule was amended by the Secretary of the U.S. Department of Health and Human Services (HHS) to include VCAs as "covered human organs" effective July 3, 2014.[3] With that directive, the OPTN was charged with the oversight of VCA procurement and transplantation. In 2014 the OPTN Board of Directors made VCA an organ type recognized by the OPTN.[4]

With the incorporation of VCA as an organ type recognized by the OPTN, the Committee considered if it was feasible to include VCA in living donor policy. Given the unique nature of VCA transplant and community concern, the Committee was not confident the requirements included in living donor policies were robust enough to cover the possibility of living VCA donation.[5] The Committee was cautious of the risks associated with including all living donors as this meant there may be insufficient guardrails or listed procedures for living VCA donors. In response, the Committee decided to revise living donor policies to specifically name organs by type: liver, kidney, lung, pancreas, and intestine.[6] It was felt at the time that the majority of VCA donations would come from deceased donors and living donation would rarely be practiced as living uterine donation was a brand new concept. Living donor policy to this day only applies to the organs listed in the policy.[7]

In 2015, the Living Donor, VCA, and Ethics Committees formed a workgroup to develop the guidance document, *VCAs from Living Donors*.[8] Concerns had been raised by committee members regarding the lack of definitions of VCA organs for which living donation may and may not be suitable, the absence of program requirements for safe live VCA donor recovery, and the lack of policies for the informed

[2] *Proposal to Modify Existing or Establish New Requirements for the Psychosocial and Medical Evaluation for Living Donor*, OPTN Living Donor Committee, November 2014, https://optn.transplant.hrsa.gov/media/1451/pubcommentpropsub_337.pdf (accessed June 15, 2020).
[3] Department of Health and Human Services, Final rule, "Organ Procurement and Transplantation Network, 42 CFR Part 121," *Federal Register* 78, No. 128 (July 3, 2013). https://www.govinfo.gov/content/pkg/FR-2013-07-03/pdf/2013-15731.pdf (accessed June 15, 2020).
[4] Policy Notice, Changes to OPTN Bylaws and Policies from actions at June Board of Directors Meeting, July 1, 2014, https://optn.transplant.hrsa.gov/media/1279/policynotice_20140701.pdf (accessed June 25, 2020).
[5] Ibid.
[6] Ibid.
[7] OPTN Policy 14, *Living Donation*, (June 8, 2020).
[8] *VCAs from living donors*, OPTN VCA Committee, June 2015, https://optn.transplant.hrsa.gov/resources/by-organ/vascular-composite-allograft/vcas-from-living-donors/ (accessed June 15, 2020).

consent, medical, and psychosocial evaluation of living VCA donors. The drafting of this document was a response to these concerns, however the guidance is non-binding. The fundamental tenet of the document is that guidance and future policy must be specific to VCA categories.

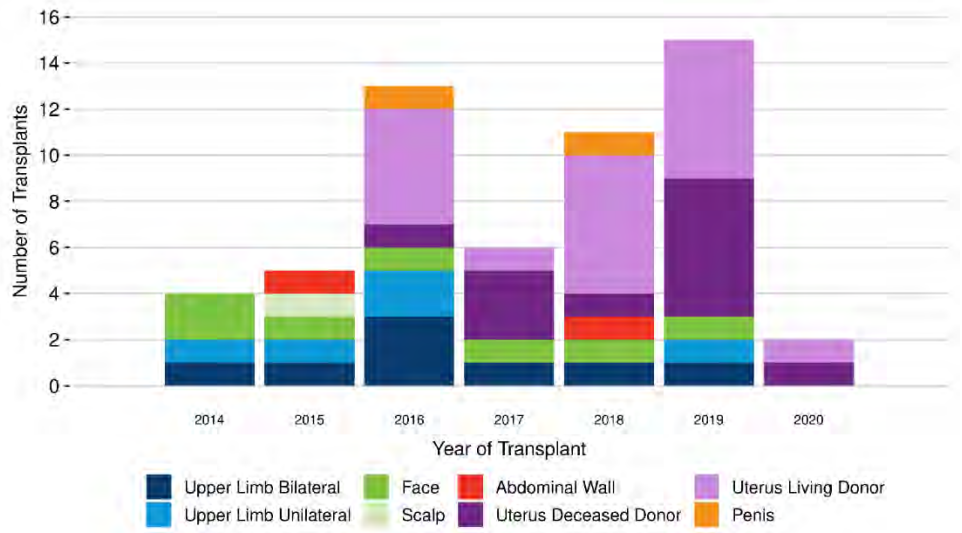
> "*It should be recognized that there are many different types of VCA donation and given the individualized nature of the reconstructive and non-reconstructive VCA procedures, the specific risks of each cannot be encapsulated or covered by general principles*."[9]

The field of VCA transplantation was introduced in 1998 following the first hand transplant in France.[10] This case introduced the concept of "restorative" VCA transplants, which are now accepted as a viable option for patients with reconstructive needs that would be more difficult with traditional methods. Restorative VCA transplantation is intended to "restore musculoskeletal function and/or body form to the affected recipient in the setting of trauma, tumor, infection, and congenital differences".[11] Since 1998, there have been several living donor restorative VCA transplants. One example of this in the U.S. was a case in 2008 where abdominal wall tissue was transplanted between twin sisters for breast reconstruction following mastectomy.[12]

Non-restorative VCA, such as uterine transplantation, repairs lost or missing non-essential function (i.e. reproductive) to an otherwise healthy individual. The first documented uterus transplant from a deceased donor was reported in 2002 in Saudi Arabia.[13] In 2016, the first U.S. uterus transplant was performed at the Cleveland Clinic.[14] Between September 2016 and May 2020 there have been 31 uterine transplants, 19 of which have been from living donors (**Figure 1**). These transplants occurred under program-specific Institutional Review Board (IRB) clinical trials with pre-determined protocols and procedures.

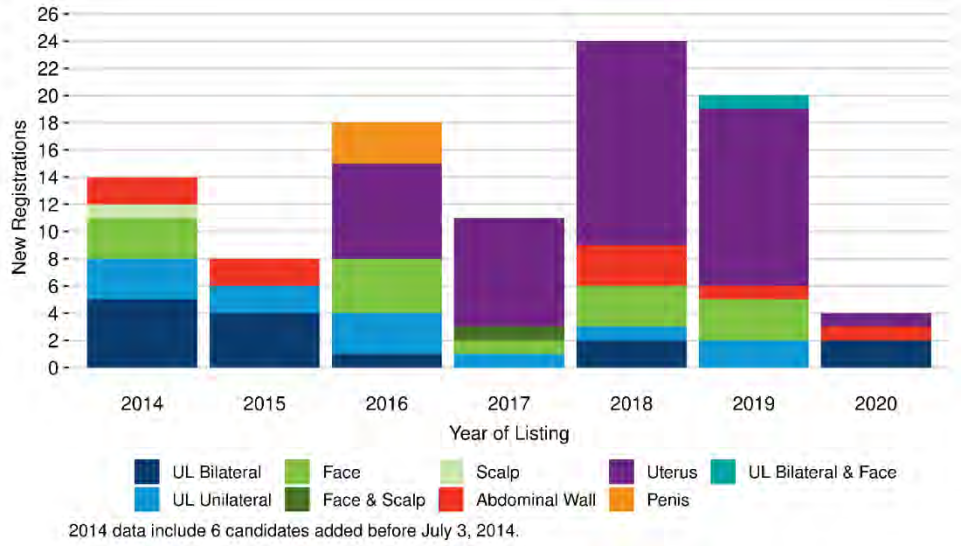
[9] *VCAs from living donors*, OPTN VCA Committee, June 2015, https://optn.transplant.hrsa.gov/resources/by-organ/vascular-composite-allograft/vcas-from-living-donors/ (accessed June 15, 2020).
[10] Dubernard JM, et al. "Functional results of the first human double-hand transplantation," *Annals of Surgery*, 2003; 238:128–136. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1422660/ (accessed June 15, 2020).
[11] Ibid.
[12] Allen, R.J., et al., "Transplantation in Identical Twins: Another Option for Breast Reconstruction," *Plastic and Reconstructive Surgery*, 2008; 122: 1019-1023. https://journals.lww.com/plasreconsurg/Abstract/2008/10000/Transplantation_in_Identical_Twins__Another_Option.3.aspx (accessed June 15, 2020).
[13] Johannesson, Liza and Jarvholm, Stina, "Uterus transplantation: current progress and future prospects," *International Journal of Women's Health*, 2016; 8: 43-51. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4751897/ (accessed June 15, 2020).
[14] "Cleveland Clinic Performs First Uterine Transplant in U.S.," *Cleveland Clinic,* February 26, 2016. https://consultqd.clevelandclinic.org/cleveland-clinic-performs-first-uterine-transplantation/ (accessed June 15, 2020).

Figure 1: VCA Transplants in the U.S.: July 4, 2014 – June 3, 2020



Over half of the candidates added to the VCA waiting list since 2016 were uterus candidates, making uterus the most sought-after VCA transplant (**Figure 2**). While other forms of living VCA donation have not been performed in the United States in recent years, the Committee is conscious of the possibility of other forms of living VCA donation developing in the future. For example, a living testicle donation was performed in Serbia in 2019.[15]

Figure 2: VCA Waitlist Additions by Organ and Year: 2014 – 2020



In 2006, the Secretary of HHS directed the OPTN "to develop policies regarding living organ donors and living organ donor recipients, including policies for the equitable allocation of living donor organs, in

[15] Grady, Denise. "Surgeons Transplant a Testicle from One Brother to His Twin," *New York Times*, December 6, 2019. https://www.nytimes.com/2019/12/06/health/testicles-transplant.html (accessed June 15, 2020).

accordance with section 121.8 of the final rule".[16] As VCAs are organs, the OPTN has the authority and responsibility to develop policies regarding living VCA donors and recipients of living VCA donor organs. Additionally, two of the OPTN's strategic goals are to "improve waitlisted patient, living donor, and transplant recipient outcomes," and "to promote living donor and transplant recipient safety."[17] Given the rapid increase of living uterus donation and transplant, the Living Donor and VCA Committees identified a need to modify current policy and data collection practices for living VCA donors. Various literature have also stressed the importance for the OPTN to develop formal policies and data submission requirements on live uterus donation.[18, 19, 20]

To develop this proposal, the Committee established the Living Donor VCA Workgroup (the Workgroup), comprised of members from the Living Donor, VCA, and Ethics Committees as well as a living uterine donor. The Workgroup members included coordinators, physicians, and surgeons, some of whom represent current uterus transplant programs. The Workgroup also collaborated with the OPTN Disease Transmission Advisory Committee (DTAC) to develop proposed elements for transmissible disease testing under *Policy 14.4: Medical Evaluation Requirements for Living Donors*. The proposal was informed by Committee and Workgroup member expertise, Institutional Review Board (IRB) protocols of existing uterus transplant programs, as well as relevant clinical literature.

Concurrently, the VCA Committee established the VCA Living Donor Data Collection Workgroup to develop a proposal to update the Living Donor Registration (LDR) form, Living Donor Follow-Up (LDF) form, and *Policy 18: Data Submission Requirements* to include VCA living donors in OPTN data collection.[21] Some members served on both workgroups simultaneously and these proposals are designed to complement each other.

Purpose

Living VCA donors are not currently covered by *Policy 14: Living Donation*. The proposed policy change would ensure all living donors, including VCA donors, are covered by OPTN living donor policy.

This proposal aligns with two goals of the OPTN Strategic Plan: "improve waitlisted patient, living donor, and transplant recipient outcomes" and "to promote living donor and transplant recipient safety."[22] For patient safety, and to allow the policy to grow with the future evolution of the VCA field, the policy is

[16] Department of Health and Human Services, Health Resources and Services Administration, "Response to Solicitation on Organ Procurement and Transplantation Network Living Donor Guidelines," 71 Fed. Reg. 34946, 34948 (June 16, 2006). https://www.federalregister.gov/documents/2006/06/16/E6-9401/response-to-solicitation-on-organ-procurement-and-transplantation-network-optn-living-donor (accessed June 23, 2020).
[17] OPTN Strategic Plan, 2018-2021, https://optn.transplant.hrsa.gov/media/2392/executive_publiccomment_strategicplan_20180122.pdf (accessed June 25, 2020).
[18] *VCAs from living donors*, OPTN VCA Committee, June 2015, https://optn.transplant.hrsa.gov/resources/by-organ/vascular-composite-allograft/vcas-from-living-donors/ (accessed June 15, 2020).
[19] Allyse, Megan, et al. "American Society for Reproductive medicine position statement on uterus transplantation: a committee opinion," *Fertil Steril*, 2018; 110: 605-610. https://pubmed.ncbi.nlm.nih.gov/30196945/ (accessed June 15, 2020).
[20] Horvat, Margaret and Iltis, Ana, "What Are Good Guidelines for Evaluating Uterus Transplantation?," *AMA Journal of Ethics*, 2019; 21: 988-995. https://journalofethics.ama-assn.org/sites/journalofethics.ama-assn.org/files/2019-10/msoc2-1911.pdf (accessed June 15, 2020).
[21] *Modify Data Collection on VCA Living Donors*, OPTN VCA Committee, August 2020, https://optn.transplant.hrsa.gov/governance/public-comment/
[22] Ibid.

being expanded to cover all living donors. The purpose of this proposal is to establish safeguards and compliance standards for living VCA donor programs.

Overview of Proposal

The proposal is to revise living donor policies to make them applicable to all living donors. Additionally, the proposal would add living VCA donation-specific elements to informed consent and medical evaluation requirements. The proposed changes along with the VCA Committee's *Modify Data Collection on VCA Living Donors* proposal would ensure living donor safety, monitor member compliance, and establish an avenue for assessing outcomes for living VCA donors.[23]

Updating Policy to Cover All Living Donors

Current policy includes language under *Policies 14.1*, *14.2*, *14.3*, and *14.4* that specify the policies apply to living kidney, liver, pancreas, lung, and intestine donors. The proposed update removes this language entirely and in effect would cause the policy to apply to all living donors. "Living donor" is defined in OPTN policy as "a living individual from whom at least one organ is recovered for transplantation".[24] Furthermore, the definition of "organ" is defined in the Final Rule as:

> *"Organ means a human kidney, liver, heart, lung, pancreas, intestine (including the esophagus, stomach, small and/or large intestine, or any portion of the gastrointestinal tract) or vascularized composite allograft (defined in this section). Blood vessels recovered from an organ donor during the recovery of such organ(s) are considered part of an organ with which they are procured for purposes of this part if the vessels are intended for use in organ transplantation and labeled "For use in organ transplantation only.""*[25]

Informed Consent

Current policy includes general informed consent requirements under *Table 14-1: Requirements for Living Donor Informed Consent* for all covered living donors.[26] There are also additional tables with requirements unique to living kidney and liver donors. Similarly, the Committee proposes adding a new table to informed consent policy specific to living VCA donors. The proposed elements are summarized in **Table 1**.

[23] *Modify Data Collection on VCA Living Donors*, OPTN VCA Committee, August 2020, https://optn.transplant.hrsa.gov/governance/public-comment/
[24] OPTN Policy 1.2, *Definitions* (June 8, 2020).
[25] OPTN Final Rule, 42 CFR § 121.2 (July 20, 2020).
[26] OPTN Policy 14.3, *Informed Consent Requirements* (June 8, 2020).

Table 1: Additional Requirements for the Informed Consent of Living VCA Donors

The recovery hospital must:	These additional elements as components of informed consent for living VCA donors:

Disclose to all living non-genitourinary VCA organ donors according to the definition of Vascularized Composite Allograft (VCA) in *Policy 1.2: Definitions*	There are surgical, psychosocial, and financial risks associated with living non-genitourinary VCA donation, which may be temporary or permanent and include, but are not limited to, *all* of the following:
	• Potential surgical risks:
	  • Loss of function
	  • Physical disability
	  • Physical disfigurement
	• Potential psychosocial risk: Feelings of emotional distress or grief if the transplant recipient does not experience a successful functional or cosmetic outcome
	• Potential financial impacts: Procedure may not be covered by health insurance

Disclose to all living genitourinary VCA organ donors according to the definition of Vascularized Composite Allograft (VCA) in *Policy 1.2: Definitions*	There are surgical, psychosocial, and financial risks associated with living genitourinary VCA donation, which may be temporary or permanent and include, but are not limited to, *all* of the following:
	• Potential surgical risks:
	  • Bowel injury
	  • Decreased fertility (male)
	  • Inability to bear children (female)
	  • Loss of function
	  • Need for hormonal replacement therapy
	  • Pain or discomfort with intercourse
	  • Physical disfigurement (male)
	  • Urinary tract injury or dysfunction
	• Potential psychosocial risk: Feelings of emotional distress or grief if the transplant recipient does not experience a successful functional, cosmetic, or reproductive outcome
	• Potential financial impacts: Procedure may not be covered by health insurance

The table divides living VCA donors into two categories: non-genitourinary and genitourinary. In early drafting, the table distinguished between living non-reproductive and reproductive VCA donors. However, the updated definition of VCA (to be implemented in OPTN policy in 2021) includes a list of VCA organs as follows:[27]

- Upper limb (including, but not limited to, any group of body parts from the upper limb or radial forearm flap)

[27] Executive Summary for June 6-7, 2016, OPTN Board of Directors Meeting, https://optn.transplant.hrsa.gov/media/1953/executive_summary_06-2016.pdf (accessed June 15, 2020).

- Head and neck (including, but not limited to, face including underlying skeleton and muscle, larynx, parathyroid gland, scalp, trachea, or thyroid)
- Abdominal wall (including, but not limited to, symphysis pubis or other vascularized skeletal elements of the pelvis)
- Genitourinary organs (including, but not limited to, uterus, internal/external male and female genitalia, or urinary bladder)
- Glands (including, but not limited to adrenal or thymus)
- Lower limb (including, but not limited to, pelvic structures that are attached to the lower limb and transplanted intact, gluteal region, vascularized bone transfers from the lower extremity, anterior lateral thigh flaps, or toe transfers)
- Musculoskeletal composite graft segment (including, but not limited to, latissimus dorsi, spine axis, or any other vascularized muscle, bone, nerve, or skin flap)
- Spleen

The language was changed to non-genitourinary and genitourinary to match language in the new definition of VCA.[28] Tying this language to the definition of VCA in *OPTN Policy 1* would also ensure the policy is aligned with the definition of VCA if it were to be updated further in the future. The two categories have similar informed consent requirements but the differences are unique enough to warrant the distinction between the two.

Potential Surgical Risks

The largest differences between the non-genitourinary and genitourinary categories fall under the potential surgical risks. The potential to be able to donate other types of VCA organs as the field evolves warranted the addition of three surgical risks for non-genitourinary organs that are not covered in the general informed consent requirements. These three potential surgical risks are:

- Loss of function
- Physical disability
- Physical disfigurement

General requirements already require programs to disclose the potential for scarring. However, the Committee felt the wide range of possible VCA donations had the potential to cause physical disfigurement, disability, and loss of function for the donor beyond general scarring (ex. limb, abdominal wall). Loss of function and physical disfigurement are found in the genitourinary category as well.

For the genitourinary category, the Workgroup originally listed potential surgical risks for uterus donors only, with “inability to bear children” as an absolute risk. However, through Workgroup and Committee discussions, the decision was made to include potential surgical risks that would cover other potential reproductive organ donation (ex. testicular transplant).[29, 30] Therefore, the list of potential surgical risks for genitourinary organ donation was amended to include:

[28] Meeting Summary for May 6, 2020 meeting, OPTN Living Donor VCA Workgroup, https://optn.transplant.hrsa.gov/media/3791/20200506-living-donor-vca-workgroup-meeting-summary.pdf (accessed June 15, 2020).
[29] Ibid.
[30] Grady, Denise. “Surgeons Transplant a Testicle from One Brother to His Twin,” *New York Times*, December 6, 2019. https://www.nytimes.com/2019/12/06/health/testicles-transplant.html (accessed June 15, 2020).

- Bowel injury
- Decreased fertility (male)
- Inability to bear children (female)
- Loss of function
- Need for hormonal replacement therapy
- Pain or discomfort with intercourse
- Physical disfigurement (male)
- Urinary tract injury or dysfunction

General requirements currently require programs to disclose "bowel obstruction" as a potential surgical risk. However, "bowel injury" was added as a potential surgical risk here due to the proximity of genitourinary organs (such as uterus) to the rectum.[31] These risks were informed by the clinical expertise of Workgroup members, existing literature, as well as IRB protocols of existing uterus transplant programs.[32, 33, 34, 35, 36, 37, 38, 39, 40]

Psychosocial Risks

Current informed consent policy requires programs to disclose psychosocial risks to the donor, including "feelings of emotional distress or grief if the transplant recipient experiences any recurrent disease or if the transplant recipient dies".[41] The Workgroup discussed editing this requirement, as VCA transplant doesn't necessarily occur due to disease. For example, uterus transplants specifically occur so the recipient may experience pregnancy and give birth. A uterus transplant is considered successful not only by the organ's function, but by the delivery of a healthy child.[42] A donation of this nature could have unique psychological meaning for the donor.[43, 44, 45] Therefore, the Workgroup

[31] Meeting Summary for April 22, 2020 meeting, OPTN Living Donor VCA Workgroup, https://optn.transplant.hrsa.gov/media/3790/20200422-living-donor-vca-workgroup-meeting-summary.pdf (accessed June 15, 2020).
[32] Baylor Research Institute, *Uterine Transplantation and Pregnancy Induction in Women affected by Absolute Uterine Factor Infertility (Donor)*, Institutional Review Board Protocols, 2019.
[33] Brigham and Women's Hospital, *Uterine Transplant in Absolute Uterine Infertility (AUIF)*, Institutional Review Board Protocols, 2016.
[34] Allyse, Megan, et al. "American Society for Reproductive medicine position statement on uterus transplantation: a committee opinion," Fertil Steril, 2018; 110: 605-610. https://pubmed.ncbi.nlm.nih.gov/30196945/ (accessed June 15, 2020).
[35] Brännström, Mats, et al. "Uterus Transplant: A Rapidly Expanding Field," Transplantation, 2018; 102: 569-577. https://pubmed.ncbi.nlm.nih.gov/29210893/ (accessed June 15, 2020).
[36] Johannesson, Liza and Jarvholm, Stina, "Uterus transplantation: current progress and future prospects," International Journal of Women's Health, 2016; 8: 43-51. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4751897/ (accessed June 15, 2020).
[37] Horvat, Margaret and Iltis, Ana, "What Are Good Guidelines for Evaluating Uterus Transplantation?," AMA Journal of Ethics, 2019; 21: 988-995. https://journalofethics.ama-assn.org/sites/journalofethics.ama-assn.org/files/2019-10/msoc2-1911.pdf (accessed June 15, 2020).
[38] Kisu, Iori, et al. "Risks for Donors in Uterus Transplantation," *Reproductive Sciences*, 2013; 20: 1406-1415. https://journals.sagepub.com/doi/10.1177/1933719113493517 (accessed June 15, 2020).
[39] O'Donovan, Laura, "Pushing the boundaries: Uterine transplantation and the limits of reproductive autonomy," Bioethics, 2018; 32: 489-498. https://doi.org/10.1111/bioe.12531 (accessed June 15, 2020).
[40] Zaami, S, et al. "Advancements in uterus transplantation," European Review for Medical and Pharmacological Sciences, 2019; 23: 892-902. https://pubmed.ncbi.nlm.nih.gov/30720198/ (accessed June 15, 2020).
[41] OPTN Policy 14.3, *Informed Consent Requirements* (June 8, 2020).
[42] Ibid.
[43] Ibid.
[44] Ibid.
[45] Ibid.

created language that would address the donor's potential feelings if the donation did not result in a successful outcome (ex. uterus donation resulting in a successful pregnancy). It was recognized a change to the general informed consent language would affect all living donor programs and could potentially cause significant administrative burden. The Workgroup and the Committee ultimately decided not to change the language in the general informed consent requirement but instead add a potential psychosocial risk unique to non-genitourinary and genitourinary VCA organs as follows:[46,47]

- Non-Genitourinary: Feelings of emotional distress or grief if the transplant recipient does not experience a successful functional or cosmetic outcome
- Genitourinary: Feelings of emotional distress or grief if the transplant recipient does not experience a successful functional, cosmetic, or reproductive outcome

Financial Risks

General informed consent policy requires programs to inform living donors of financial risks associated with the possibility of the procedure having a negative impact on their ability to "obtain, maintain, or afford health insurance, disability insurance, and life insurance".[48] The Workgroup felt since VCA transplant is still considered experimental and a donor's health insurance may not cover their care related to the transplant at all, there was a need to add more robust language related to healthcare within the table for VCA donors.[49] The proposed table includes language to highlight this additional risk for living VCA donors. [50]

- Potential financial impacts: Procedure may not be covered by health insurance

The Committee is seeking public feedback on the proposed Additional Requirements for the Informed Consent of Living VCA Donors table (**Table 1**):

- Is the policy language sufficiently clear enough to be incorporated into hospital protocol?
- Do you agree with the potential surgical risks for genitourinary and non-genitourinary donors?
- Do you agree with the potential psychosocial and financial risks for genitourinary and non-genitourinary donors?
- Are there other VCA-specific or uterine-specific surgical, psychosocial, or financial risks the Committee should consider incorporating into the table?

[46] Meeting Summary for April 20, 2020 meeting, OPTN Living Donor Committee, https://optn.transplant.hrsa.gov/media/3792/20200420-living-donor-meeting-summary.pdf (accessed June 15, 2020).
[47] Meeting Summary for April 22, 2020 meeting, OPTN Living Donor VCA Workgroup, https://optn.transplant.hrsa.gov/media/3790/20200422-living-donor-vca-workgroup-meeting-summary.pdf (accessed June 15, 2020).
[48] OPTN Policy 14.3, *Informed Consent Requirements* (June 8, 2020).
[49] Meeting Summary for April 22, 2020 meeting, OPTN Living Donor VCA Workgroup, https://optn.transplant.hrsa.gov/media/3790/20200422-living-donor-vca-workgroup-meeting-summary.pdf (accessed June 15, 2020).
[50] Brigham and Women's Hospital, *Uterine Transplant in Absolute Uterine Infertility (AUIF)*, Institutional Review Board Protocols, 2016.

Medical Evaluation Requirements

Current policy includes medical evaluation requirements under *Table 14-5: Requirements for Living Donor Medical Evaluations* for all covered living donors.[51] There are also requirements unique to living kidney and liver donors. Similarly, the Committee proposes adding a new table to the medical evaluation requirements policy specific to living VCA donors. Most of the proposed elements are specific to living uterus donors, but there is one required test that would apply to all VCA donors. The proposed elements are summarized in **Table 2**.

Table 2: Additional Requirements for the Medical Evaluation of Living VCA Donors

This evaluation must be completed:	Including evaluation for and assessment of this information:
Transmissible disease screening for all VCA donors	Infectious disease testing must be performed in a CLIA-certified laboratory or in a laboratory meeting equivalent requirements as determined by CMS using FDA-licensed, approved, or cleared tests. Testing must include *all* of the following: • Toxoplasma Immunoglobulin G (IgG) antibody test
Additional Specific medical history for uterus donors	• Gynecological and obstetric history including prior childbirth
Additional Specific tests for uterus donors	• Pap smear
Additional anatomic assessment for uterus donors	• Pelvic exam • A radiological assessment must be performed to determine if the uterus is anatomically suitable for transplantation

[51] OPTN Policy 14.4, *Medical Evaluation Requirements for Living Donors* (June 8, 2020).

This evaluation must be completed:	Including evaluation for and assessment of this information:
Additional transmissible disease screening for uterus donors	Infectious disease testing must be performed in a CLIA-certified laboratory or in a laboratory meeting equivalent requirements as determined by CMS using FDA-licensed, approved, or cleared tests. Testing must include *all* of the following: • Bacterial Vaginosis (Gardnerella Vaginalis) • Chlamydia by nucleic acid test (NAT) • Gonorrhea by nucleic acid test (NAT) • Herpes Simplex Virus (HSV) 1/2 Immunoglobulin G (IgG) antibody test • Human Papilloma Virus (HPV) cervical specimen only by DNA or mRNA • Trichomoniasis • Fungal screening to include Vaginal Candidiasis (at evaluation and time of donation)

Transmissible Disease Screening for all VCA donors

Currently, toxoplasma is a required test for all deceased donors but is not a required test for living donors. The DTAC recommended adding this test as a requirement for VCA living donors as it is especially important for skeletal muscle and uterine type transplants. Testing for toxoplasma is important for uterine transplant due to the potential for reactivation under immunosuppression and to infect a fetus, as fetal infection (congenital toxoplasmosis) can have lifelong implications including mental disability and severe eye infections.[52] Additionally, once a person is infected with Toxoplasma gondii, tachyzoites have a propensity for skeletal muscle, which may be relevant for other types of living VCA donations in the future. [53] The Workgroup recognized the potential need to make this a required test for all living donors, but that fell outside the scope of this project, which was focused on VCA living donation.

The Committee is seeking public feedback on the proposed toxoplasma requirement included in the table (**Table 2**):

- Should toxoplasma be a required test for all living donors?

Additional Tests and Medical History for Uterus Donors

The rest of the proposed table is dedicated to uterus-specific tests. These requirements are informed by Workgroup member expertise, IRB protocols of existing uterus programs, clinical literature, and consultation with the OPTN Disease Transmission Advisory Committee (DTAC).

[52] "Toxoplasmosis," *Mayo Clinic*. https://www.mayoclinic.org/diseases-conditions/toxoplasmosis/symptoms-causes/syc-20356249 (accessed June 15, 2020).
[53] Montoya, JG and Liesenfeld, O, "Toxoplasmosis," *Lancet,* 2004; 363: 1965-1976. https://pubmed.ncbi.nlm.nih.gov/15194258/ (accessed June 15, 2020.

The collection of medical history on gynecological and obstetric history, requirement for a pap smear and pelvic exam, and radiological assessment represent the minimum evaluation requirements that were found in uterus program IRB protocols.[54, 55] As part of the living donor's medical history, the Committee proposes collecting their history of pregnancy and childbirth, since pregnancy and childbirth are the desired outcomes of uterus transplant. Specific data elements related to the collection of this medical history can be found in the VCA Committee's *Modify Data Collection on VCA Living Donors* proposal.[56] The radiological assessment language included in the proposed table is also consistent with existing language for the evaluation of liver donors.[57]

The required transmissible disease screening requirements for uterus donors are informed by IRB protocols of existing uterus programs and DTAC expertise.[58, 59] The two workgroups made sure to align the list of required tests within the proposed policy and updates to the LDR form. The required tests are included because positive results could impact the outcome of the uterus transplant and the viability of the fetus.[60] The proposed testing requirements for living uterus donors are as follows:

- Bacterial Vaginosis (Gardnerella Vaginalis)
- Chlamydia by nucleic acid test (NAT)
- Gonorrhea by nucleic acid test (NAT)
- Herpes Simplex Virus (HSV) 1/2 Immunoglobulin G (IgG) antibody test
- Human Papilloma Virus (HPV) cervical specimen only by DNA or mRNA
- Trichomoniasis
- Fungal screening to include Vaginal Candidiasis (at evaluation and time of donation)

The Committee is seeking public feedback on the proposed Additional Requirements for the Medical Evaluation of Living VCA Donors table (**Table 2**):

- Is the policy language sufficiently clear enough to be incorporated into hospital protocol?
- Do you agree with the uterine-specific evaluations and tests required in the table?
- Are there other VCA-specific or uterine-specific evaluations or tests the Committee should consider incorporating into the table?

Exclusion Criteria for Living VCA Donors

The Workgroup did discuss whether to add living VCA donor exclusion criteria to *Policy 14*. For example, various literature recommends restricting uterus donation to a maximum age.[61] However, there is a lack of consensus in the community on what the cutoff age should be. Also, current OPTN policy does not

[54] Baylor Research Institute, *Uterine Transplantation and Pregnancy Induction in Women affected by Absolute Uterine Factor Infertility (Donor)*, Institutional Review Board Protocols, 2019.
[55] Brigham and Women's Hospital, *Uterine Transplant in Absolute Uterine Infertility (AUIF)*, Institutional Review Board Protocols, 2016.
[56] *Modify Data Collection on VCA Living Donors*, OPTN VCA Committee, August 2020, https://optn.transplant.hrsa.gov/governance/public-comment/
[57] OPTN Policy 14.4.C, *Additional Requirements for the Medical Evaluation of Living Liver Donors* (June 8, 2020).
[58] Ibid.
[59] Ibid.
[60] Ibid.
[61] Brännström, Mats, et al. "Uterus Transplant: A Rapidly Expanding Field," Transplantation, 2018; 102: 569-577. https://pubmed.ncbi.nlm.nih.gov/29210893/ (accessed June 15, 2020).

have a maximum age restriction on the living donation of other organ types. Therefore, the Workgroup decided to leave that decision to the hospital's internal protocols.[62] As for other types of VCA transplant, the Workgroup did not believe there was sufficient data and collective experience to recommend any specific exclusion criteria at this time.

Omission from Outcomes Reporting

Current policy includes requirements for programs to provide donors with outcome and survival data under *Table 14-4: Required Recipient Outcome and Transplanted Organ Survival Data*.[63] The table is specific to outcomes reports developed by the Scientific Registry of Transplant Recipients (SRTR) and the SRTR does not currently track VCA data. Additionally, the OPTN does not currently collect this data. Once VCA data collection is implemented, it would take considerable time for there to be enough outcomes data to inform the SRTR outcomes model and reports VCA programs would need to comply with the policy. Also, graft survival data would not be an appropriate metric for some types of VCA. For example, uterus transplants are temporary transplants in nature as they are removed after childbirth. Therefore, VCA donations are excluded from the requirement at this time.

For more information on the VCA Committee's work on evaluating data collection for uterus recipients and their children, see the *Update to VCA Transplant Outcomes Data Collection* proposal and *Measuring Transplant Outcomes by Collecting Data on Children Born to Uterus Recipients* request for feedback from January 2020 Public Comment.[64, 65]

Collaboration with VCA Committee

As previously stated, this proposal was developed in conjunction with a data collection proposal from the VCA Committee. The *Modify Data Collection on VCA Living Donors* proposal would add data submission requirements for VCA to *Policy 18: Data Collection Requirements* and add VCA and uterus specific elements to the LDR and LDF forms.[66] The Living Donor and VCA Committees ensured alignment between the medical evaluation testing requirements and the data fields being added to the LDR.

The VCA Committee's proposal has a delayed implementation timeline due to UNet^{SM} programming needs. For this reason, changes to *Policy 14.5.C: Reporting of Living Donor Blood Type and Subtype* can be found in the VCA Committee's proposal as they will require UNet implementation.

[62] Meeting Summary for April 8, 2020 meeting, OPTN Living Donor VCA Workgroup, https://optn.transplant.hrsa.gov/media/3742/20200408_living-donor_vca-workgroup_meeting-summary.pdf (accessed June 15, 2020).
[63] OPTN Policy 14.4, *Requirements for the Medical Evaluation of Living Donors* (June 8, 2020).
[64] *Update to VCA Transplant Outcomes Data Collection*, OPTN VCA Committee, January 2020, https://optn.transplant.hrsa.gov/governance/public-comment/update-to-vca-transplant-outcomes-data-collection/
[65] *Measuring Transplant Outcomes by Collecting Data on Children Born to Uterus Recipients*, OPTN VCA Committee, January 2020, https://optn.transplant.hrsa.gov/governance/public-comment/measuring-transplant-outcomes-by-collecting-data-on-children-born-to-uterus-recipients/
[66] *Modify Data Collection on VCA Living Donors*, OPTN VCA Committee, August 2020, https://optn.transplant.hrsa.gov/governance/public-comment/

NOTA and Final Rule Analysis

In 2006, the Department of Health and Human Services (HHS) stated that the oversight of living donation of all types falls under the authority of the OPTN.[67]

> "*Under 42 CFR 121.4(a)(6), the Secretary directs the OPTN "to develop policies regarding living organ donors and living organ donor recipients, including policies for the equitable allocation of living donor organs, in accordance with section 121.8 of the final rule."* [68]

In 2014, the OPTN Final Rule was amended by the Secretary of the U.S. Department of Health and Human Services (HHS) to include vascularized composite allografts (VCAs) as "covered human organs".[69] This proposal is consistent with the OPTN's responsibility to continue to develop living donor policies regarding living VCA donors and recipients of living VCA donors. This proposal establishes safeguards and compliance standards for living VCA donor programs.

Implementation Considerations

Member and OPTN Operations

Operations affecting Transplant Hospitals

VCA-specific transplant programs will need to become familiar with OPTN policy for living donors. Administrative staff will need to become familiar with the new types of living organ donors that would be covered by the revised policy. This proposal may add additional administrative burden for programs, to adapt protocols to include the informed consent and medical evaluation requirements related to VCA, particularly uterus transplantation. However these VCA-specific protocols should be similar to evaluations currently done for other living donor types with some unique elements for VCA donors. Staff training and education will be necessary to implement and administer the new requirements for VCA living donor programs.

Operations affecting the OPTN

This proposal will not require programming. Communication will be necessary and determined following public comment.

Operations affecting Histocompatibility Laboratories

This proposal is not anticipated to affect the operations of histocompatibility laboratories.

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[67] Department of Health and Human Services, Health Resources and Services Administration, "Response to Solicitation on Organ Procurement and Transplantation Network Living Donor Guidelines," 71 Fed. Reg. 34946 No. 116 (June 16, 2006). https://www.federalregister.gov/documents/2006/06/16/E6-9401/response-to-solicitation-on-organ-procurement-and-transplantation-network-optn-living-donor (accessed June 23, 2020).

[68] Ibid.

[69] Department of Health and Human Services, Final rule, "Organ Procurement and Transplantation Network, 42 CFR Part 121," *Federal Register* 78, No. 128 (July 3, 2013). https://www.govinfo.gov/content/pkg/FR-2013-07-03/pdf/2013-15731.pdf (accessed June 15, 2020).

Operations affecting Organ Procurement Organizations

This proposal is not anticipated to affect the operations of organ procurement organizations.

Potential Impact on Select Patient Populations

This proposal aims to protect the safety of living VCA donors by including them in living donor policy, ensuring member compliance with policy requirements. The primary impact of this proposal will be on transplant hospitals with approved VCA programs.

Projected Fiscal Impact

Projected Impact on Transplant Hospitals

The time and cost to implement these changes at transplant hospitals are minimal. Protocol development and implementation will require time of existing staff. Staff administers these processes for other organ programs presently.

Time for centers to create protocols for psychosocial evaluation would need to be developed with the guidelines outlined in the policy. Creating protocols for informed consent, psychosocial evaluation, and medical evaluation requirements should be similar to evaluations presently conducted for Living Donors with some unique elements for VCA donors, specifically uterus donors. Staff training and education will be necessary to implement and administer the informed consent process and psychosocial evaluation that will be required for VCA living donors.

Burden of this work can be absorbed with current staff, but may increase if VCA programs grow in volume. VCA programs are still smaller in size/volume compared to other organ programs.

Implementation is estimated at one to three months, but may be longer depending on the time needed to develop a VCA-specific protocol.

Projected Impact on the OPTN

Preliminary estimates indicate that this would be a small project for the OPTN to implement. The OPTN estimates approximately 250 hours may be needed for Member Quality monitoring plan updates and developing post-implementation review plans.

Projected Impact on Histocompatibility Laboratories

This proposal is not anticipated to have any fiscal impact on histocompatibility laboratories.

Projected Impact on Organ Procurement Organizations

This proposal is not anticipated to have any fiscal impact on OPOs.

Post-implementation Monitoring

Member Compliance

The proposed language will not change the current OPTN monitoring processes for living donor recovery hospitals. Site surveyors will continue to review living donor medical records and hospital policies and protocols, and interview hospital staff to verify that living donors are evaluated and consented according to OPTN policy requirements and the hospital's own policies and protocols.

Policy Evaluation

The following metrics, and any others subsequently requested by the Committee, will be monitored to evaluate the effect of the policy approximately 6 months after implementation, and as needed thereafter.

- The number of living VCA donors by VCA type
- The number of living donor events (required reporting under Policy 18.6) reported for living VCA donors
- LDR and LDF data submission for living VCA donors will also be monitored, as the complementary proposal *Modify Data Collection on Living VCA Donors* will impact LDR/LDF data collection for these donors.

Conclusion

This proposal would update *Policy 14*: *Living Donation* to cover all living donors and by default add VCA organs to living donor policy as well as add unique informed consent and medical evaluation requirements for living VCA donors. These changes are being proposed to promote patient safety in an evolving field. The new policy requirements would establish safeguards and compliance standards for living VCA donor programs. This proposal was developed in conjunction with a related proposal, *Modify Data Collection on VCA Living Donors*, which is also being released for public comment in August 2020.[70] The *Modify Data Collection on VCA Living Donors* proposal would add data submission requirements for VCA to *Policy 18: Data Collection Requirements* and add VCA and uterus specific elements to the LDR and LDF forms. The Living Donor and VCA Committees ensured alignment between the medical evaluation testing requirements and the data fields being added to the required forms.

The Committee is seeking feedback on the following questions:

The Committee is seeking public feedback on the proposed Additional Requirements for the Informed Consent of Living VCA Donors (**Table 1**) and Additional Requirements for the Medical Evaluation of Living VCA Donors tables (**Table 2**):

- Is the proposed policy language sufficiently clear enough to be incorporated into hospital protocol?
- Do you agree with the potential surgical risks for genitourinary and non-genitourinary donors in **Table 1**?

[70] *Modify Data Collection on VCA Living Donors*, OPTN VCA Committee, August 2020, https://optn.transplant.hrsa.gov/governance/public-comment/

- Do you agree with the potential psychosocial and financial risks for genitourinary and non-genitourinary donors in **Table 1**?
- Are there other VCA-specific or uterine-specific surgical, psychosocial, or financial risks the Committee should consider incorporating into the table?
- Do you agree with the uterine-specific evaluations and tests required in **Table 2**?
- Are there other VCA-specific or uterine-specific evaluations or tests the Committee should consider incorporating into the table?
- Should toxoplasma be a required test for all living donors?

Policy Language

Proposed new language is underlined (example) and language that is proposed for removal is struck through (~~example~~). Heading numbers, table and figure captions, and cross-references affected by the numbering of these policies will be updated as necessary.

14.1 Psychosocial Evaluation Requirements for Living Donors

14.1.A Living Donor Psychosocial Evaluation Requirements

~~Living donor psychosocial evaluation requirements apply to living kidney, liver, pancreas, lung, and intestine donors.~~

The living donor psychosocial evaluation must be performed by a psychiatrist, psychologist, masters prepared social worker, or licensed clinical social worker prior to organ recovery. Documentation of the psychosocial evaluation must be maintained in the living donor medical record and include *all* of the following components:

1. An evaluation for any psychosocial issues, including mental health issues, that might complicate the living donor's recovery and could be identified as risks for poor psychosocial outcome.
2. An evaluation for the presence of behaviors that may increase risk for disease transmission as defined by the *U.S. Public Health Service (PHS) Guideline.*
3. A review of the living donor's history of smoking, alcohol, and drug use, including past or present substance abuse disorder.
4. The identification of factors that warrant educational or therapeutic intervention prior to the final donation decision.
5. The determination that the living donor understands the short and long-term medical and psychosocial risks for both the living donor and recipient associated with living donation.
6. An assessment of whether the decision to donate is free of inducement, coercion, and other undue pressure by exploring the reasons for donating and the nature of the relationship, if any, to the transplant candidate.
7. An assessment of the living donor's ability to make an informed decision and the ability to cope with the major surgery and related stress. This includes evaluating whether the donor has a realistic plan for donation and recovery, with social, emotional and financial support available as recommended.
8. A review of the living donor's occupation, employment status, health insurance status, living arrangements, and social support.
9. The determination that the living donor understands the potential financial implications of living donation.

14.2 Independent Living Donor Advocate (ILDA) Requirements

14.2.A ILDA Requirements for Living Donor Recovery Hospitals

~~Living donor ILDA requirements apply to living kidney, liver, pancreas, intestine, and lung donors.~~

For any living donor who is undergoing evaluation for donation, the living donor recovery hospital must designate and provide each living donor with an ILDA who is not involved with the potential recipient evaluation and is independent of the decision to transplant the potential recipient. The ILDA may be one person or an ILDA team with multiple members. An ILDA team must designate one person from the team as the key contact for each living donor. All ILDA requirements must be completed prior to organ recovery.

The ILDA must:

1. Function independently from the transplant candidate's team.
2. Advocate for the rights of the living donor.
3. Fulfill the qualification and training requirements specified in the recovery hospital's protocols regarding knowledge of living organ donation, transplantation, medical ethics, informed consent, and the potential impact of family or other external pressure on the living donor's decision about whether to donate.
4. Review and document whether the living donor has received information on each of the following areas and assist the donor in obtaining additional information from other professionals as needed about the:
    a. Informed consent process as described in *Policy 14.3: Informed Consent Requirements*
    b. Evaluation process according to *Policies 14.1.A: Living Donor Psychosocial Evaluation Requirements* and *14.4.A: Living Donor Medical Evaluation Requirements*
    c. Surgical procedure
    d. Follow-up requirements, and the benefit and need for participating in recovery hospital's requirements according to *Policies 18.1: Data Submission Requirements, 18.5: Living Donor Data Submission Requirements, and 18.6: Reporting of Living Donor Adverse Events*

14.2.B ILDA Protocols for Living Donor Recovery Hospitals

The living donor recovery hospital must develop, and once developed must comply with, written protocols for:

1. The composition of the ILDA team, if the hospital uses a team.
2. The qualifications and training (both initial and ongoing) required for the ILDA. Minimum qualifications must include knowledge of living organ donation, transplantation, medical ethics, informed consent, and the potential impact of family or other external pressures on the potential living donor's donation decision. Document that each requirement has been met.
3. The duties and responsibilities of the ILDA, which must include at least the functions and duties according to *Policy 14.2.A: ILDA Requirements for Living Donor Recovery Hospitals.*
4. The process the living donor recovery hospital will provide for the ILDA to file a grievance when necessary to protect the rights or best interests of the living donor.
5. The process the living donor recovery hospital will use to address any grievance raised by the ILDA concerning the rights or best interests of the living donor.

14.3 Informed Consent Requirements

The living donor recovery hospital is responsible for obtaining and documenting informed consent prior to organ recovery. Informed consent requirements ~~apply to living kidney, liver, pancreas, intestine, and lung donors and~~ must include *all* of the components in *Tables 14-1* through *14-5*. Documentation of informed consent must be maintained in the living donor medical record.

Table 14-1: Requirements for Living Donor Informed Consent

The recovery hospital must:	These elements of informed consent :
Obtain from living donors	The living donor's signature on a document that confirms that the donor: 1. Is willing to donate 2. Is free from inducement and coercion 3. Has been informed that he or she may decline to donate at any time
Provide to living donors	1. An opportunity to discontinue the living donor consent or evaluation process in a way that is protected and confidential. 2. The ILDA must be available to assist the living donor during the consent process, according to *Policy 14.2: Independent Living Donor Advocate (ILDA) Requirements*. 3. Instruction about all phases of the living donation process, which includes: • Consent • Medical and psychosocial evaluations • Pre- and post-operative care • Required post-operative follow-up according to *Policy 18.5: Living Donor Data Submission Requirements.* Teaching or instructional material can include any media, one-on-one or small group interaction. Teaching or instruction must be provided in a language in which the living donor is able to engage in meaningful dialogue with recovery hospital's staff.

Disclose to living donors	1. It is a federal crime for any person to knowingly acquire, obtain or otherwise transfer any human organ for anything of value including, but not limited, to cash, property, and vacations. 2. The recovery hospital must provide an ILDA. 3. Alternate procedures or courses of treatment for the recipient, including deceased donor transplantation. 4. A deceased donor organ may become available for the candidate before the recovery hospital completes the living donor's evaluation or the living donor transplant occurs. 5. Transplant hospitals determine candidacy for transplantation based on existing hospital specific guidelines or practices and clinical judgment. 6. The recovery hospital will take all reasonable precautions to provide confidentiality for the living donor and recipient. 7. Any transplant candidate may have an increased likelihood of adverse outcomes (including but not limited to graft failure, complications, and mortality) that: • Exceed local or national averages • Do not necessarily prohibit transplantation • Are not disclosed to the living donor 8. The recovery hospital can disclose to the living donor certain information about candidates only with permission of the candidate, including: • The reasons for a transplant candidate's increased likelihood of adverse outcomes • Personal health information collected during the transplant candidate's evaluation, which is confidential and protected under privacy law 9. Health information obtained during the living donor evaluation is subject to the same regulations as all medical records and could reveal conditions that must be reported to local, state, or federal public health authorities. 10. The recovery hospital is required to: a. Report living donor follow-up information, at the time intervals specified in *Policy 18.5: Living Donor Data Submission Requirements.* b. Have the donor commit to post donation follow-up testing coordinated by the recovery hospital. 11. Any infectious disease or malignancy that is pertinent to acute recipient care discovered during the donor's first two years of follow-up care: a. May need to be reported to local, state or federal public health authorities b. Will be disclosed to their recipient's transplant hospital c. Will be reported through the OPTN Improving Patient Safety Portal 12. A living donor must undergo a medical evaluation according to *Policy 14.4: Medical Evaluation Requirements for Living Donors* and a psychosocial evaluation as required by *Policy 14.1: Psychosocial Evaluation Requirements for Living Donors*. 13. The hospital may refuse the living donor. In such cases, the recovery hospital must inform the living donor that a different recovery hospital may evaluate the living donor using different selection criteria. 14. The following are inherent risks associated with evaluation for living donation: a. Allergic reactions to contrast b. Discovery of reportable infections

The recovery hospital must:	These elements of informed consent :
	c. Discovery of serious medical conditions d. Discovery of adverse genetic findings unknown to the living donor e. Discovery of certain abnormalities that will require more testing at the living donor's expense or create the need for unexpected decisions on the part of the transplant team 15. There are surgical, medical, psychosocial, and financial risks associated with living donation, which may be temporary or permanent and include, but are not limited to, *all* of the following: a. Potential medical or surgical risks: i. Death ii. Scars, hernia, wound infection, blood clots, pneumonia, nerve injury, pain, fatigue, and other consequences typical of any surgical procedure iii. Abdominal symptoms such as bloating, nausea, and developing bowel obstruction iv. That the morbidity and mortality of the living donor may be impacted by age, obesity, hypertension, or other donor-specific pre-existing conditions b. Potential psychosocial risks: i. Problems with body image ii. Post-surgery depression or anxiety iii. Feelings of emotional distress or grief if the transplant recipient experiences any recurrent disease or if the transplant recipient dies iv. Changes to the living donor's lifestyle from donation c. Potential financial impacts: i. Personal expenses of travel, housing, child care costs, and lost wages related to donation might not be reimbursed; however, resources might be available to defray some donation-related costs ii. Need for life-long follow up at the living donor's expense iii. Loss of employment or income iv. Negative impact on the ability to obtain future employment v. Negative impact on the ability to obtain, maintain, or afford health insurance, disability insurance, and life insurance vi. Future health problems experienced by living donors following donation may not be covered by the recipient's insurance

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92 **Table 14-2: Additional Requirements for the Informed Consent of Living Kidney Donors**

The recovery hospital must:	These additional elements as components of informed consent for living kidney donors:
Provide to all living kidney donors	Education about expected post-donation kidney function, and how chronic kidney disease (CKD) and end-stage renal disease (ESRD) might potentially impact the living donor in the future, to include: a. On average, living donors will have a 25-35% permanent loss of kidney function after donation. b. Although risk of ESRD for living kidney donors does not exceed that of the general population with the same demographic profile, risk of ESRD for living kidney donors may exceed that of healthy non-donors with medical characteristics similar to living kidney donors. c. Living donor risks must be interpreted in light of the known epidemiology of both CKD and ESRD. When CKD or ESRD occurs, CKD generally develops in mid-life (40-50 years old) and ESRD generally develops after age 60. The medical evaluation of a young living donor cannot predict lifetime risk of CKD or ESRD. d. Living donors may be at a higher risk for CKD if they sustain damage to the remaining kidney. The development of CKD and subsequent progression to ESRD may be faster with only one kidney. e. Dialysis is required if the living donor develops ESRD. f. Current practice is to prioritize prior living kidney donors who become kidney transplant candidates according to *Policy 8.3: Kidney Allocation Points*.
Disclose to all living kidney donors	Surgical risks may be transient or permanent and include but are not limited to: • Decreased kidney function • Acute kidney failure and the need for dialysis or kidney transplant for the living donor in the immediate post-operative period
Disclose to all female living kidney donors	Risks of preeclampsia or gestational hypertension are increased in pregnancies after donation

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94 **Table 14-3: Additional Requirements for the Informed Consent of Living Liver Donors**

The recovery hospital must:	These additional elements as components of informed consent for living liver donors:
Disclose to all living liver donors	Surgical risks may be transient or permanent and include but are not limited to: • Acute liver failure with need for liver transplant. • Transient liver dysfunction with recovery. The potential for transient liver dysfunction depends upon the amount of the total liver removed for donation. • Risk of red cell transfusions or other blood products. • Biliary complications, including leak or stricture that may require additional intervention. • Post-donation laboratory tests may result in abnormal or false positive results that may trigger additional tests that have associated risks.

Table 14-4: Additional Requirements for the Informed Consent of Living VCA Donors

The recovery hospital must:	These additional elements as components of informed consent for living VCA donors:

Disclose to all living non-genitourinary VCA organ donors according to the definition of Vascularized Composite Allograft (VCA) in *Policy 1.2: Definitions*	There are surgical, psychosocial, and financial risks associated with living non-genitourinary VCA donation, which may be temporary or permanent and include, but are not limited to, *all* of the following:
	• Potential surgical risks:
	  • Loss of function
	  • Physical disability
	  • Physical disfigurement
	• Potential psychosocial risk: Feelings of emotional distress or grief if the transplant recipient does not experience a successful functional or cosmetic outcome
	• Potential financial impacts: Procedure may not be covered by health insurance

Disclose to all living genitourinary VCA organ donors according to the definition of Vascularized Composite Allograft (VCA) in *Policy 1.2: Definitions*	There are surgical, psychosocial, and financial risks associated with living genitourinary VCA donation, which may be temporary or permanent and include, but are not limited to, *all* of the following:
	• Potential surgical risks:
	  • Bowel injury
	  • Decreased fertility (male)
	  • Inability to bear children (female)
	  • Loss of function
	  • Need for hormonal replacement therapy
	  • Pain or discomfort with intercourse
	  • Physical disfigurement (male)
	  • Urinary tract injury or dysfunction
	• Potential psychosocial risk: Feelings of emotional distress or grief if the transplant recipient does not experience a successful functional, cosmetic, or reproductive outcome
	• Potential financial impacts: Procedure may not be covered by health insurance

As part of the informed consent process, recovery hospitals must also provide transplant recipient outcome and transplanted organ survival data to living donors according to *Table 14-5*.

Table 14-5: Required Recipient Outcome and Transplanted Organ Survival Data
(The requirements in Table 14-5 do not apply to VCA donations)

If the recovery hospital and the recipient hospital:	Then the recovery hospital must provide the living donor with:	Including *all* the following information:
Are the same	Both national and that hospital's program-specific transplant recipient outcomes from the most recent Scientific Registry of Transplant Recipients (SRTR) program-specific reports.	• National 1-year patient and transplanted organ survival • The hospital's 1-year patient and transplanted organ survival • Notification about all Centers for Medicare and Medicaid Services (CMS) outcome requirements not being met by the transplant hospital
Will not be the same and the recipient hospital is known	Both national and the recipient hospital's program-specific transplant recipient outcomes from the most recent SRTR program-specific reports.	• National 1-year patient and transplanted organ survival • The recipient hospital's 1-year patient and transplanted organ survival • Notification about all CMS outcome requirements not being met by the recipient hospital
Will not be the same and the recipient hospital is not known	National transplant recipient outcomes from the most recent SRTR reports.	• National 1-year patient and transplanted organ survival

14.4 Medical Evaluation Requirements for Living Donors

14.4.A Living Donor Medical Evaluation Requirements

~~Living donor medical evaluation requirements only apply to living kidney, liver, pancreas, lung or intestine donors.~~

A medical evaluation of the living donor must be performed by the recovery hospital and by a physician or surgeon experienced in living donation. Documentation of the medical evaluation must be maintained in the donor medical record.

The medical evaluation must include *all* of the components in *Tables 14-6* through *14-10* below.

Table 14-6: Requirements for Living Donor Medical Evaluations

This evaluation must be completed:	Including evaluation for and assessment of this information:
General donor history	1. A personal history of significant medical conditions which include but are not limited to: a. Hypertension b. Diabetes c. Lung disease d. Heart disease e. Gastrointestinal disease f. Autoimmune disease g. Neurologic disease h. Genitourinary disease i. Hematologic disorders j. Bleeding or clotting disorders k. History of cancer including melanoma 2. History of infections 3. Active and past medications with special consideration for known nephrotoxic and hepatotoxic medications or chronic use of pain medication. 4. Allergies 5. An evaluation for coronary artery disease
General family history	• Coronary artery disease • Cancer
Social history	• Occupation • Employment status • Health insurance status • Living arrangements • Social support • Smoking, alcohol and drug use and abuse • Psychiatric illness, depression, suicide attempts • Increased risk behavior as defined by the *U.S. Public Health Services (PHS) Guideline*
Physical Exam	• Height • Weight • BMI • Vital signs • Examination of all major organ systems

This evaluation must be completed:	Including evaluation for and assessment of this information:
General laboratory and imaging tests	• Complete blood count (CBC) with platelet count • Blood type and subtype as specified in *Policy 14.5: Living Donor Blood Type Determination and Reporting* and its subsections • Prothrombin Time (PT) or International Normalized Ratio (INR) • Partial Thromboplastin Time (PTT) • Metabolic testing (to include electrolytes, BUN, creatinine, transaminase levels, albumin, calcium, phosphorus, alkaline phosphatase, bilirubin) • HCG quantitative pregnancy test for premenopausal women without surgical sterilization • Chest X-Ray • Electrocardiogram (ECG)
Transmissible disease screening	Infectious disease testing must be performed in a CLIA-certified laboratory or in a laboratory meeting equivalent requirements as determined by Centers for Medicare and Medicaid Services (CMS) using FDA-licensed, approved, or cleared tests. Testing must include *all* the following: 1. CMV (Cytomegalovirus) antibody 2. EBV (Epstein Barr Virus) antibody 3. HIV antibody (anti-HIV) testing or HIV antigen/antibody (Ag/Ab) combination test as close as possible, but within 28 days prior to organ recovery 4. Hepatitis B surface antigen (HBsAg) testing as close as possible, but within 28 days prior to organ recovery 5. Hepatitis B core antibody (anti-HBc) testing as close as possible, but within 28 days prior to organ recovery 6. Hepatitis C antibody (anti-HCV) testing as close as possible, but within 28 days prior to organ recovery 7. HCV ribonucleic acid (RNA) by nucleic acid test (NAT) as close as possible, but within 28 days prior to organ recovery 8. Syphilis testing If a living donor is identified as being at increased risk for HIV, HBV, and HCV transmission according to the *U.S. Public Health Services (PHS) Guideline*, testing must also include HIV ribonucleic acid (RNA) by NAT or HIV antigen/antibody (Ag/Ab) combination test. This does not apply to donors whose only increased risk factor is receiving hemodialysis within the preceding 12 months, as they are at risk only for HCV according to the *U.S. Public Health Services (PHS) Guideline.* For tuberculosis (TB), living donor recovery hospitals must determine if the donor is at increased risk for this infection. If TB risk is suspected, testing must include screening for latent infection using *either*: • Intradermal PPD • Interferon Gamma Release Assay (IGRA)

This evaluation must be completed:	Including evaluation for and assessment of this information:
Endemic transmissible diseases	Each living donor hospital must develop and follow a written protocol for identifying and testing donors at risk for transmissible seasonal or geographically defined endemic disease as part of its medical evaluation.
Cancer screening	Recovery hospitals must develop and comply with protocols consistent with the American Cancer Society (ACS) or the U.S. Preventive Services Task Force to screen for: • Cervical cancer • Breast cancer • Prostate cancer • Colon cancer • Lung cancer

14.4.B Additional Requirements for the Medical Evaluation of Living Kidney Donors

Table 14-7: Additional Requirements for the Medical Evaluation of Living Kidney Donors

This evaluation must be completed:	Including evaluation for and assessment of this information:
Kidney-specific donor history	A personal history of significant medical conditions which include, but are not limited to, kidney-specific personal history including: a. Genetic renal diseases b. Kidney disease, proteinuria, hematuria c. Kidney injury d. Diabetes including gestational diabetes e. Nephrolithiasis f. Recurrent urinary tract infections
Kidney-specific family history	• Kidney disease • Diabetes • Hypertension • Kidney Cancer
Physical Exam	• Blood pressure taken on at least two different occasions or 24-hour or overnight blood pressure monitoring
Other metabolic testing	• Fasting blood glucose • Fasting lipid profile (cholesterol, triglycerides, HDL cholesterol, and LDL cholesterol) • Glucose tolerance test or glycosylated hemoglobin in first degree relatives of diabetics and in high risk individuals

This evaluation must be completed:	Including evaluation for and assessment of this information:
Kidney-specific tests	• Urinalysis or urine microscopy • Urine culture if clinically indicated • Measurement of urinary protein and albumin excretion • Measurement of glomerular filtration rate by isotopic methods or a creatinine clearance calculated from a 24-hour urine collection • Hospitals must develop and comply with a written protocol for polycystic kidney disease or other inherited renal disease as indicated by family history • Patients with a history of nephrolithiasis or nephrolithiasis (>3 mm) identified on radiographic imaging must have a 24-hour urine stone panel measuring: o Calcium o Oxalate o Uric acid o Citric acid o Creatinine o Sodium
Anatomic assessment	Determine: • Whether the kidneys are of equal size • If the kidneys have masses, cysts, or stones • If the kidneys have other anatomical defects • Which kidney is more anatomically suited for transplant

14.4.C Additional Requirements for the Medical Evaluation of Living Liver Donors

Table 14-8: Additional Requirements for the Medical Evaluation of Living Liver Donors

This evaluation must be completed:	Including evaluation for and assessment of this information:
Liver-specific family history	• Liver diseases • Bleeding or clotting disorders
General laboratory and imaging tests	• Hospitals must develop and follow a written protocol for hypercoagulable state evaluation

This evaluation must be completed:	Including evaluation for and assessment of this information:
Liver-specific tests	• Hepatic function panel • Ceruloplasmin in a donor with a family history of Wilson's Disease • Iron, iron binding capacity, ferritin • Alpha-1-antitrypsin level: those with a low alpha-1-antitrypsin levels should have a phenotype • must develop and follow a written protocol for testing for genetic diseases • Hospitals must develop and follow a written protocol for screening for autoimmune disease • Hospitals must develop and follow a written protocol for pre-donation liver biopsy
Anatomic assessment	A radiological assessment must be performed to determine if the liver is anatomically suitable for transplantation, and to assess safety of resection for the donor. The evaluation must include at least all of the following: • Assessment of projected graft volume • Donor's remnant volume, • Vascular anatomy • Presence of steatosis

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124 **14.4.D Additional Requirements for the Medical Evaluation of Living VCA Donors**

125 **Table 14-9: Additional Requirements for the Medical Evaluation of Living VCA Donors**

This evaluation must be completed:	Including evaluation for and assessment of this information:
Transmissible disease screening for all VCA donors	Infectious disease testing must be performed in a CLIA-certified laboratory or in a laboratory meeting equivalent requirements as determined by CMS using FDA-licensed, approved, or cleared tests. Testing must include *all* of the following: • Toxoplasma Immunoglobulin G (IgG) antibody test
Additional Specific medical history for uterus donors	• Gynecological and obstetric history including prior childbirth
Additional Specific tests for uterus donors	• Pap smear
Additional anatomic assessment for uterus donors	• Pelvic exam • A radiological assessment must be performed to determine if the uterus is anatomically suitable for transplantation

This evaluation must be completed:	Including evaluation for and assessment of this information:
Additional transmissible disease screening for uterus donors	Infectious disease testing must be performed in a CLIA-certified laboratory or in a laboratory meeting equivalent requirements as determined by CMS using FDA-licensed, approved, or cleared tests. Testing must include *all* of the following: • Bacterial Vaginosis (Gardnerella Vaginalis) • Chlamydia by nucleic acid test (NAT) • Gonorrhea by nucleic acid test (NAT) • Herpes Simplex Virus (HSV) 1/2 Immunoglobulin G (IgG) antibody test • Human Papilloma Virus (HPV) cervical specimen only by DNA or mRNA • Trichomoniasis • Fungal screening to include Vaginal Candidiasis (at evaluation and time of donation)

14.4.E Living Donor Exclusion Criteria

Table 14-10: Living Donor Exclusion Criteria

Exclusion Criteria	
Exclusion criteria for all Living Donors	Living donor recovery hospitals may exclude a donor with any condition that, in the hospital's medical judgment, causes the donor to be unsuitable for organ donation. Living donor recovery hospitals must exclude all donors who meet any of the following exclusion criteria: • Is both less than 18 years old and mentally incapable of making an informed decision • HIV, unless the requirements for a variance are met, according to *Policy 15.7: Open Variance for the Recovery and Transplantation of Organs from HIV-positive Donors* • Active malignancy, or incompletely treated malignancy • High suspicion of donor coercion • High suspicion of illegal financial exchange between donor and recipient • Evidence of acute symptomatic infection (until resolved) • Uncontrolled diagnosable psychiatric conditions requiring treatment before donation, including any evidence of suicidality
Additional Exclusion Criteria for Living Kidney Donors	Kidney recovery hospitals must exclude all donors who meet *any* of the following additional exclusion criteria: • Uncontrollable hypertension or history of hypertension with evidence of end organ damage • Diabetes

Exclusion Criteria	
Additional Exclusion Criteria for Living Liver Donors	Liver recovery hospitals must exclude all donors who meet *any* of the following additional exclusion criteria: • HCV RNA positive • HBsAg positive • Donors with ZZ, Z-null, null-null and S-null alpha-1-antitrypsinphenotypes and untype-able phenotypes • Expected donor remnant volume less than 30% of native liver volume • Prior living liver donor

14.5 Living Donor Blood Type Determination and Reporting

Recovery hospitals must develop and comply with a written protocol for blood type determination and reporting that includes all of the requirements below.

14.5.A Living Donor Blood Type Determination

The recovery hospital must ensure that each living donor's blood type is determined by testing at least two donor blood samples prior to generation of the living donor ID. The recovery hospital must develop and comply with a written protocol to resolve conflicting primary blood type results.

Living donor blood samples must:

1. Be drawn on two separate occasions
2. Have different collection times
3. Be submitted as separate samples
4. Have results indicating the same blood type

The recovery hospital must document that blood type determination was conducted according to the hospital's protocol and the above requirements.

14.5.B Living Donor Blood Subtype Determination

Subtyping is optional for living donors.

If the recovery hospital chooses to subtype *and* pre-red blood cell transfusion samples are available, then subtyping must be completed according to *Table 14-11*.

Table 14-11: Subtyping Requirements by First Subtype Result

If the donor's primary blood type is:	A second subtyping must be completed if the first subtype result is:
A	Blood type A, non-A_1
AB	Blood type AB, non-A_1B

Living donor blood samples for subtyping must:

1. Be tested using pre-red blood cell transfusion samples
2. Be drawn on two separate occasions
3. Have different collection times
4. Be submitted as separate samples

All subtype results reported to the OPTN Contractor must be from two separate tests indicating the same result. If there are conflicting subtype results, the subtype results must not be reported to the OPTN Contractor and living donor transplant compatibility or allocation must be based on the primary blood type.

If subtype is determined and reported, the recovery hospital must document that subtyping was conducted according to the above requirements.

14.5.C Reporting of Living Donor Blood Type and Subtype

The recovery hospital must report and verify the living donor blood type prior to registration with the OPTN Contractor using the *Living Donor Feedback Form* as required below:

1. Two different qualified health care professionals, as defined in the recovery hospital's protocol, must each make an independent report to the OPTN Contractor for blood type. For VCA recoveries, the blood type verification and reporting must be recorded in the living donor's medical record.
2. If blood subtype is used for ensuring transplant compatibility or allocation, a qualified health care professional must report blood subtype to the OPTN Contractor. This report must be verified by a different qualified health care professional according to the recovery hospital's protocol. For VCA recoveries, the blood subtype verification and reporting must be recorded in the living donor's medical record.
3. Both qualified health care professionals must use all blood type and subtype determination source documents to verify they:
    a. Contain blood type and subtype (if used for ensuring transplant compatibility or allocation) results for the donor
    b. Indicate the same blood type and subtype (if used for ensuring transplant compatibility or allocation) on the two test results
    c. Match the result reported to the OPTN Contractor or VCA donor medical record

The recovery hospital must document that reporting was completed according to the hospital's protocol and the above requirements.

14.6 Placement of Living Donor Organs

14.6.A Prospective Crossmatching prior to Kidney Placement

A prospective crossmatch is mandatory for all potential kidney living donor recipients. Guidelines for policy development, including assigning risk and timing of crossmatch testing, are outlined in *Policy 4: Histocompatibility.*

14.6.B Placement of Non-directed Living Donor Organs

Prior to determining the placement of a non-directed living donor organ, including non-directed organs from domino donors and non-domino therapeutic organ donors, the recovery hospital must obtain the match run of its waiting list candidates from its local OPO or the Organ Center. When a non-directed living donor organ is placed, the recovery hospital must document how the organ is placed and the rationale for placement.

This requirement does not apply to non-directed living kidney donors who donate a kidney through a Kidney Paired Donation (KPD) arrangement.

14.6.C Transplant Hospital Acceptance of Living Donor Organs

A transplant hospital must only accept and transplant living donor organs according to *Table 14-12* below.

Table 14-12: Transplant Hospital Requirements for Accepting and Transplanting Living Donor Organs

If this type of living donor organ is being recovered:	Then the recovery hospital must:
Kidney	Meet the requirements according to the *OPTN Bylaws E.6: Kidney Transplant Programs that Perform Living Donor Recovery*
Liver	Meet the requirements according to the *OPTN Bylaws F.8: Liver Transplant Programs that Perform Living Donor Recovery*
Other organ types, excluding kidney or liver	Have current designated transplant program approval for that organ type

14.7 Living Donor Pre-Recovery Verification

Recovery hospitals must develop and comply with a written protocol to perform pre-recovery verifications as required below.

The recovery hospital must conduct a pre-recovery verification that meets *all* of the following requirements:

1. The verification must occur prior to the induction of general anesthesia on the day of the living donor recovery.

2. Recovery hospitals must use at least one of the acceptable sources during the pre-recovery verification to verify all of the following information according to *Table 14-13* below. Recovery hospitals may use the OPTN organ tracking system for assistance in completing these verifications.

Table 14-13: Pre-Recovery Verification Requirements

The recovery hospital must verify *all* of the following information:	Using at least *one* of the following:	By *both* of the following individuals:
Donor ID	• Donor identification band containing the donor ID • Donor identification band and OPTN computer system	1. Recovery surgeon 2. Licensed health care professional
Organ type and laterality (if applicable)	• OPTN computer system	1. Recovery surgeon 2. Licensed health care professional
Donor blood type and subtype (if used for ensuring transplant compatibility or allocation)	• Donor blood type and subtype source documents	1. Recovery surgeon 2. Licensed health care professional
Intended recipient unique identifier	• Recipient medical record • OPTN computer system	1. Recovery surgeon 2. Licensed health care professional
Intended recipient blood type	• Recipient medical record • OPTN computer system	1. Recovery surgeon 2. Licensed health care professional
Donor and intended recipient are blood type compatible (or intended incompatible).	• OPTN computer system • Recipient medical record • Attestation following verification of donor and recipient blood types	1. Recovery surgeon 2. Licensed health care professional
Correct donor organ has been identified for the correct intended recipient	• Donor medical record • OPTN computer system • Attestation following verification of donor ID, organ, and recipient unique identifier	1. Recovery surgeon 2. Licensed health care professional

The recovery hospital must document that the verification was completed according to the hospital's protocol and the above requirements.

14.8 Packaging, Labeling, and Transporting of Living Donor Organs, Extra Vessels, and Tissue Typing Materials

Recovery hospitals are responsible for packaging and labeling any living donor organs, or tissue typing specimens that are recovered from living donors according to *Policy 16: Organ and Extra Vessels Packaging, Labeling, Shipping, and Storage* when *either* of the following occurs:

- Living donor organs or tissue typing specimens are recovered and must be transported outside the recovery hospital
- A living donor organ or tissue typing specimens require repackaging by a transplant hospital for transport outside the transplant hospital

14.8.A Living Donor Extra Vessels Recovery and Storage

A recovery hospital must only recover extra vessels for transplant if the living donor consents to the removal of extra vessels for transplant. The extra vessels from a living donor must only be used for the implantation or modification of a solid organ transplant for the original intended recipient.

Any extra vessels recovered from living donors must be stored according to *Policy 16.6.B: Extra Vessels Storage.*

14.9 Requirements for Domino Donors and Non-Domino Therapeutic Donors

Although domino donors and non-domino therapeutic donors are considered living donors, the requirements in *Policy 14: Living Donation* are limited only to *Policies 14.9.A* through *14.9.E* below for domino donors and non-domino therapeutic donors.

14.9.A Informed Consent Requirements for Domino Donors and Non-Domino Therapeutic Donors

Recovery hospitals must obtain the donor's signature on a document that confirms that the donor:

1. Is willing to donate.
2. Is free from inducement and coercion.
3. Has been informed that the donor may decline to donate at any time.
4. Has received information on treatment options that would not involve organ donation.

Recovery hospitals must also provide *all* of the following to domino donors and non-domino therapeutic donors:

1. The disclosure that the recovery hospital will take all reasonable precautions to provide confidentiality for the donor and recipient.
2. The disclosure that it is a federal crime for any person to knowingly acquire, obtain, or otherwise transfer any human organ for anything of value including, but not limited to, cash, property, and vacations.
3. The disclosure that health information obtained during the evaluation for donation is subject to the same regulations as all health records and could reveal conditions that must be reported to local, state, or federal public health authorities.
4. The disclosure that any new information discovered during the domino donor's or non-domino therapeutic donor's first two years of post-donation care that indicates risk of

potential transmission of infectious disease or malignancy to the recipient of the domino donor's or non-domino therapeutic donor's native organ:
   a. May need to be reported to local, state, or federal public health authorities
   b. Will be disclosed to the recipient's transplant hospital
   c. Will be reported through the OPTN Improving Patient Safety Portal

5. Information on treatment options that would not involve organ donation.
6. An opportunity to discontinue the donor consent or evaluation process in a way that is protected and confidential.

Documentation of the informed consent must be maintained in the donor medical record.

14.9.B Psychosocial and Medical Evaluation Requirements for Domino and Non-Domino Therapeutic Donors

Recovery hospitals must evaluate domino donors and non-domino therapeutic donors according to *all* of the following requirements:

1. Perform an evaluation for the presence of behaviors that may increase risk for disease transmission as defined by the *U.S. Public Health Service (PHS) Guideline*.
2. Screen the domino donor or non-domino therapeutic donor for all of the following according to *Policy 14.4: Medical Evaluation Requirements for Living Donors*, *Table 14-6: Requirements for Living Donor Medical Evaluations*.
3. Transmissible diseases screening.
4. Endemic transmissible diseases.
5. Cancer screening.
6. Develop and comply with written protocols for the domino donor and non-domino. therapeutic donor exclusion criteria considering incorporating as appropriate the elements of *Table 14-10: Living Donor Exclusion Criteria*.
7. Register and verify the blood type of the domino donor or non-domino therapeutic donor according to *Policy 14.5: Living Donor Blood Type Determination and Reporting*.

Documentation of the psychosocial and medical evaluation must be maintained in the donor medical record.

14.9.C Recovery of Domino Donor and Non-Domino Therapeutic Donor Organs

Transplant hospitals can recover domino donor and non-domino therapeutic donor organs if the hospital has current designated transplant program approval for that organ type.

14.9.D Acceptance of Domino Donor and Non-Domino Therapeutic Donor Organs

Transplant hospitals must only accept domino donor and non-domino therapeutic donor organs recovered at transplant hospitals that have a current designated transplant program approval for that organ type.

14.9.E Reporting and Data Submission Requirements for Domino Donors and Non-Domino Therapeutic Donors

Recovery hospitals must submit the living donor feedback and living donor registration (LDR) forms for the domino donor and non-domino therapeutic donor according to *Policy 18.1: Data Submission Requirements*.

14.10 Living Donor Organ Check-In

Transplant hospitals must perform organ check-ins as required by *Policy 5.7: Organ Check-In*.

14.11 Living Donor Pre-Transplant Verification

Transplant hospitals must perform pre-transplant verifications as required by *Policy 5.8: Pre-Transplant Verification.*

14.12 Reporting Requirements

Members are responsible for submitting living donor forms according to *Policy 18.5: Living Donor Data Submission Requirements.*

##

OPTN

Public Comment Proposal

COVID-19 Emergency Policies and Data Collection

OPTN Executive Committee

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UNOS Policy and Community Relations Department

Contents

COVID-19 Emergency Policies and Data Collection

Affected Policies:	*1.4.F: Updates to Candidate Data during 2020 COVID-19 Emergency* *3.7.D: Applications for Modification of Kidney Waiting Time during 2020 COVID-19 Emergency* *18.1: Data Submission Requirements* *18.2: Timely Collection of Data* *18.5.A: Reporting Requirements after Living Kidney Donation* *18.5.B: Reporting Requirements after Living Liver Donation*
Sponsoring Committee:	*Executive*
Public Comment Period:	*August 4, 2020 – October 1, 2020*

Executive Summary

The current COVID-19 crisis has created unprecedented challenges for the nation's health care system and has caused several disruptions to normal transplant operations. Many OPTN policies require patient visits as well as test results to register on the waiting list, maintain waiting list status, and complete required follow ups. One of the many effects of the national emergency is the reduced ability to conduct routine outpatient procedures, including clinical testing. There is also the concern of projected or potential healthcare disruptions due to the ongoing crisis. Concerns include potential exposure to COVID-19 at health care facilities, especially since transplant recipients are at increased risk for infection due to immunosuppression. In addition, strain on healthcare resources may impact the ability to complete current OPTN requirements, especially in regards to candidate, recipient, and living donor data submission.

This public comment proposal presents a series of actions already approved by the OPTN Executive Committee using the emergency policy authority given by the OPTN bylaws. These actions assist the transplant community and promote patient safety during the COVID-19 pandemic:

- Updating Candidate Data During 2020 COVID-19 Emergency
- Relax Data Submission Requirements for Follow-up Forms
- Modify Wait Time Initiation for Non-Dialysis Kidney Candidates
- Incorporate COVID-19 Infectious Disease Testing into DonorNet®

These actions were intended to alleviate issues stemming from the COVID-19 crisis. They are scheduled to expire within 12 months from their effective date unless further amended by the Executive Committee. The OPTN Board of Directors will consider the public comments and will determine whether revisions to the policies or changes to the effective dates are warranted. If they deem modifications are necessary, they will vote on them at a meeting following the public comment period.

Following the requirements of OPTN *Bylaw 11.7*, the OPTN is seeking the following feedback:

- Were the Executive Committee's actions appropriate in the emergency?

- Should the Board of Directors select a date for the expiration of the emergency actions, or should they delegate the repeal to the Executive Committee based on review of the changing environment?
- Should COVID-19 infectious disease testing remain in DonorNet?
- Should the COVID-19 infectious disease data fields become mandatory in DonorNet?
- Should the OPTN require retrospective data entry on follow-up forms given amnesty status under the emergency policies?
- Are there other things the OPTN should have done, or can still do, to respond to the COVID-19 crisis?
- Is the emergency policy process utilized by the OPTN the most appropriate way to respond to an emerging health crisis?
- Additional feedback and recommendations are appreciated.

Background

COVID-19 presents significant and immediate challenges for transplant hospitals in managing transplant candidates, recipients, and living donors. OPTN policy requires that transplant programs submit numerous lab results, clinical procedures, and other data for transplant candidates, recipients, and living donors. These data are used for registering candidates, allocating organs, and monitoring member performance, as well as policy development. Current OPTN policy has been developed under a model of normal transplant program circumstances, meaning programs can schedule outpatient appointments for patient testing, evaluation, and post-transplant monitoring. The COVID-19 national emergency has introduced an unprecedented situation that is limiting transplant programs' ability to maintain normal procedures and, in some cases, meet the OPTN policy requirements for obtaining updated clinical data. Additionally, rapid spread of COVID-19 is causing disruptions to operations across the health care system. Patient safety is paramount, and is causing all stakeholders in the transplant system to modify operations due to infection control concerns. The OPTN identified the inability to schedule follow-up visits and potential candidate evaluations as having the potential for policy actions to alleviate some of the data reporting strain and inequity reported as resulting from the crisis.

The OPTN developed four emergency actions in response to community requests from individual members and committees, with collaboration from the following OPTN committees and their leadership: Ad Hoc Disease Transmission Advisory Committee (DTAC), Data Advisory Committee (DAC), Kidney Transplantation Committee, Liver and Intestinal Transplantation Committee, Living Donor Committee, Membership and Professional Standards Committee (MPSC), Operations and Safety Committee (OSC), Organ Procurement Organization Committee (OPO), Pancreas Transplantation Committee, Policy Oversight Committee (POC), Transplant Administrators Committee (TAC), Thoracic Organ Transplantation Committee, and Transplant Coordinators Committee (TCC).

The OPTN Executive Committee approved these four emergency actions in two stages. The Executive Committee utilized the OPTN *Bylaws 11.7: Emergency Actions* due to the emergent public health issue caused by COVID-19. *Updates to Candidate Data during 2020 COVID-19 Emergency* was approved on March 17, 2020[1], and is set to expire on March 17, 2021. This policy allowed extension of current lab results required to maintain waiting list status for liver, liver/kidney, heart, and lung candidates. *Relax Data Submission Requirements for Follow-up Forms* and *Modify Wait Time Initiation for Non-Dialysis Kidney Candidates* were approved on April 3, 2020[2], and are set to expire on December 31, 2020. The first policy provided amnesty for recipient and living donor follow up form submission. The second provided a pathway to modify wait time for non-dialysis kidney candidates after a qualifying creatinine clearance or glomerular filtration rate (GFR) was reached. The data fields for COVID-19 infectious disease testing for deceased donors were also approved on April 3, 2020, with a current end date of December 31, 2020. This added optional data fields in DonorNet® to communicate testing for SARS-CoV-2 (COVID-19).

Purpose

When emergency proposals are passed pursuant to OPTN *Bylaws 11.7: Emergency Actions*, they must be distributed for public comment within six months after approval. This provides the transplant

[1] https://optn.transplant.hrsa.gov/media/3687/covid-19-policy-notice-and-supporting-mini-brief.pdf
[2] https://optn.transplant.hrsa.gov/media/3716/covid-19_emergency_policypackage_and_minibrief.pdf

community an opportunity to comment on these emergency policies, as well as comment on the timeframes for which they should remain in effect.

The goals of these proposals were to suspend or modify certain existing policy requirements due to circumstances that prevent patients from reaching the transplant program or other health care facility for needed testing required for data reporting. Additionally, this proposal added additional data elements to more clearly and efficiently inform receiving hospitals about COVID-19 testing performed on donor organs. While the COVID-19 crisis has been impacting locations differently or at different times, the transplant community and the OPTN share a desire to protect transplant recipient and living donor safety by minimizing potential COVID-19 exposures.

This proposal also provides an initial evaluation of the transplant community's experience with and response to the COVID-19 crisis. Appendix A shows the OPTN's monitoring of the emergency actions enacted by the Executive Committee. Appendix B shows donor testing for COVID-19 reported to the OPTN.

Overview of Proposal

The proposal consists of four actions in response to the COVID-19 crisis, the first of which was approved by the OPTN Executive Committee as an emergency action on March 17, 2020[3], and the remaining three that were approved by the OPTN Executive Committee as emergency actions on April 3, 2020.[4]

Action 1: Updates to Candidate Data during 2020 COVID-19 Emergency

This policy allows transplant programs to use the most recently submitted clinical data for a candidate to maintain their current allocation priority. The policy addresses circumstances that may prevent a transplant program from obtaining updated clinical information on a candidate. For example, OPTN policy requires a liver candidate to have updated lab values in order to maintain his or her status, MELD, or PELD score.

In the event that a transplant program is unable to obtain updated lab results for a candidate, this policy allows the transplant program to carry forward the candidate's most recently reported lab results as the candidate's current lab values. Transplant programs use the same candidate data they previously entered for the data submission update, using the day of the updated submission as the "new" test result date. This prevents the system from lowering a candidate's allocation priority due to inability to obtain updated testing. Thus, candidates who have been appropriately prioritized within a status or score previously will maintain that prioritization until new clinical data can be obtained.

This policy is intended to address COVID-19 related circumstances, not other operational issues. Despite this policy being in effect, transplant programs are expected to make reasonable efforts to collect and report clinical data as required by OPTN policy. When using this emergency policy, transplant programs must document its use in the candidates' medical records.

Table 1 denotes the OPTN policies requiring regular candidate data updates that are affected by this policy.

[3] https://optn.transplant.hrsa.gov/media/3687/covid-19-policy-notice-and-supporting-mini-brief.pdf
[4] https://optn.transplant.hrsa.gov/media/3716/covid-19_emergency_policypackage_and_minibrief.pdf

Table 1: Policies requiring frequent candidate data updates

Organ	
Lung	10.1.C Priority and Clinical Data Update Schedule for Candidates Less than 12 Years Old; 10.1.E LAS Values and Clinical Data Update Schedule for Candidates at Least 12 Years Old; 10.1.G Reporting Additional Data for Candidates with an LAS of 50 or Higher; 10.2.B.i LRB Review Process; 10.2.B.v LAS Approved by the LRB
Liver, Liver/ Kidney	9.2 Status and Laboratory Values Update Schedule; 9.4.A MELD or PELD Score Exception Requests; 9.4.B NLRB and Committee Review of MELD or PELD Exceptions; 9.6 Specific Standardized MELD or PELD Score Exceptions; 9.9.B Liver-Kidney Candidate Eligibility for Candidates 18 Years or Older
Heart	6.1.A.i Veno-Arterial Extracorporeal Membrane Oxygenation (VA ECMO); 6.1.A.ii Non-dischargeable, Surgically Implanted, Non-Endovascular Biventricular Support Device; 6.1.A.iii Mechanical Circulatory Support Device (MCSD) with Life Threatening Ventricular Arrhythmia; 6.1.B Adult Heart Status 2 Requirements (subsections) ; 6.1.B.i Non-Dischargeable, Surgically Implanted, Non-Endovascular Left Ventricular Assist Device (LVAD); 6.1.B.ii Total Artificial Heart (TAH), BiVAD, Right Ventricular Assist Device (RVAD), or Ventricular Assist Device (VAD) for Single Ventricle Patients; 6.1.B.iii Mechanical Circulatory Support Device (MCSD) with Malfunction; 6.1.B.iv Percutaneous Endovascular Mechanical Circulatory Support Device; 6.1.B.v Intra-Aortic Balloon Pump (IABP); 6.1.B.vi Ventricular Tachycardia (VT) or Ventricular Fibrillation (VF); 6.1.C Adult Heart Status 3 Requirements (subsections); 6.1.C.i Dischargeable Left Ventricular Assist Device (LVAD) for Discretionary 30 Days; 6.1.C.ii Multiple Inotropes or a Single High Dose Inotrope and Hemodynamic Monitoring; 6.1.C.iii Mechanical Circulatory Support Device (MCSD) with Hemolysis; 6.1.C.iv Mechanical Circulatory Support Device (MCSD) with Pump Thrombosis; 6.1.C.v Mechanical Circulatory Support Device (MCSD) with Right Heart Failure; 6.1.C.vi Mechanical Circulatory Support Device (MCSD) with Device Infection; 6.1.C.vii Mechanical Circulatory Support Device (MCSD) with Mucosal Bleeding; 6.1.C.viii Mechanical Circulatory Support Device (MCSD) with Aortic Insufficiency (AI); 6.1.C.ix VA ECMO after 7 Days; 6.1.C.x Non-Dischargeable, Surgically Implanted, Non-Endovascular Left Ventricular Assist Device (LVAD) after 14 Days; 6.1.C.xi Percutaneous Endovascular Mechanical Circulatory Support Device after 14 Days; 6.1.C.xii Intra-Aortic Balloon Pump (IABP) after 14 Days; 6.1.D Adult Heart Status 4 Requirements (subsections); 6.1.E Adult Heart Status 5 Requirements; 6.1.F Adult Heart Status 6 Requirements; 6.2.A Pediatric Heart Status 1A Requirements; 6.3 Status Updates; 6.4 Adult and Pediatric Status Exceptions; 6.4.A.i. RRB Appeals; 6.4.A.ii Committee Appeals

This policy is set to expire on March 17, 2021. The OPTN would like input on when is the most appropriate time for regular candidate testing to go back into effect.

Action 2: Relax Data Submission Requirements for Follow-up Forms

Current OPTN policies require that transplant programs submit numerous post-transplant monitoring data for transplant recipients and living donors in the *living donor follow-up* (LDF), *organ-specific transplant recipient follow-up* (TRF), and *recipient malignancy* (PTM) forms. These policy changes relaxed requirements for follow-up form submission so that recipients and living donors do not need to go in to health care facilities to get labs taken for the purpose of submitting post-transplant data. The intent of these changes is to prevent COVID-19 exposure risk to transplant recipients and living donors, and also to alleviate demands for entering data for transplant programs in the midst of COVID-19 crisis.

These policy changes suspended the requirements for data collection and submission for the *living donor follow-up* (LDF), *organ specific transplant recipient follow-up* (TRF), and *recipient malignancy* (PTM) forms. The suspension of these requirements is backdated to March 13, 2020, the date the President of the United States declared a national emergency due to COVID-19.[5] These OPTN policy changes did not suspend the requirement to report recipient death or graft failure, but did extend the timeframe for reporting that information for transplant recipients from 14 days to 30 days. This also did not modify the reporting of living donor events such as organ failure or death, as outlined in OPTN *Policy 18.6: Reporting of Living Donor Events*. Follow-up forms will populate in a transplant program's queue as normal, but will automatically be marked in amnesty status if not submitted by the expected date. TRFs and LDFs in "amnesty" status require no further action and are not considered incomplete for the purpose of OPTN data submission requirements, but members are encouraged to access these forms and submit data retrospectively if feasible. "Amnesty" status in this context is limited to only the TRF and LDF forms.

These policy changes are set to expire on December 31, 2020. The OPTN would like to know when is the most appropriate time to no longer automatically grant amnesty status again.

Action 3: Modify Wait Time Initiation for Non-Dialysis Kidney Candidates

This policy is intended to prevent potential non-dialysis candidates who meet creatinine clearance or glomerular filtration rate (GFR) criteria required for waiting list registration from being disadvantaged due to inability of a transplant program to obtain additional required testing. The COVID-19 public health emergency has created a scenario where a patient with a qualifying GFR or creatinine clearance level, at a program that has decided to register the candidate, may be unable to obtain additional testing required for registration. As a result, a candidate would be eligible for registration but unable to begin accruing waiting time per OPTN *Policy 8.4: Waiting Time*. This emergency policy allows transplant programs to submit a waiting time modification application to retroactively apply waiting time once the candidate has completed all required testing for waiting list registration.

[5] https://www.whitehouse.gov/presidential-actions/proclamation-declaring-national-emergency-concerning-novel-coronavirus-disease-covid-19-outbreak/

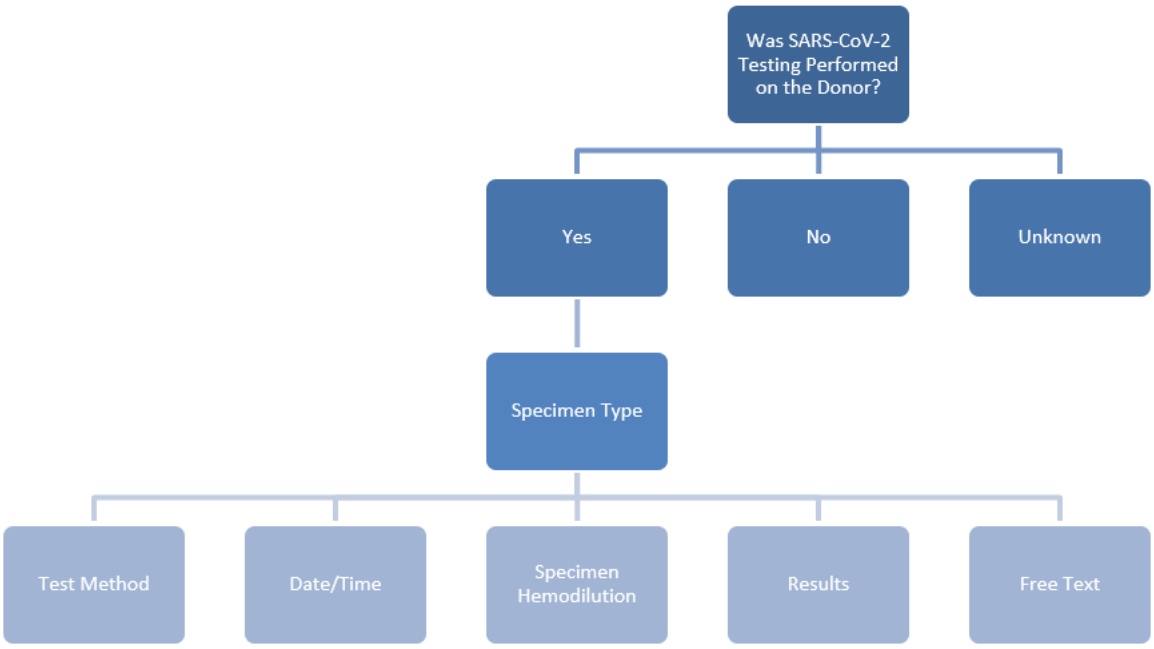
This policy is set to expire on December 31, 2020. The OPTN would like to know when is it most appropriate to require all candidate testing to be complete for registration again.

Action 4: Incorporate COVID-19 Infectious Disease Testing into DonorNet®

DonorNet® currently captures information regarding potential infectious diseases identified as a result of testing performed on deceased donors but did not include COVID-19. This action added COVID-19 testing data fields to DonorNet so accepting transplant programs can see whether donors were tested, and if so, the type of test and specimen used as well as the results. This action authorized addition of COVID-19 related data fields to DonorNet for OPOs to enter information on testing performed on deceased donors. The fields are included among the other infectious disease testing fields. Currently, the new data fields are optional.

These fields were initiated as optional to prevent any unintended consequences such as the interruption of OPO workflow and speed of organ offers. This will allow data to be gathered on testing methods, frequency and results to better inform potential future requirements and needed policy changes, consistent with the OPTN Principles of Data Collection. These data are important when assessing donors to protect patient safety and promote timely organ evaluation. These additional data elements were programmed in a format to allow for flexibility in recording test and specimen types, as more becomes known about COVID-19. *Figure 1* shows the parent question for SARS-CoV-2 testing as well as the subsequent available fields.

Figure 1: COVID-19 Data Field Map



Appendix B shows the utilization of these data fields. It also shows that all deceased donors were tested for COVID-19 between April 21, 2020 and June 30, 2020.

These data fields are set to expire on December 31, 2020. The OPTN would like to know at what time, if any, these data fields should be removed from DonorNet. The OPTN would also like to know if it should become mandatory to enter COVID-19 testing status of the donor prior to OPOs sending out organ offers. Making this field mandatory would not make donor testing for COVID-19 mandatory.

NOTA and Final Rule Analysis

These actions are in accordance with §121.4(2) "Policies, consistent with recommendations of the Centers for Disease Control and Prevention, for the testing of organ donors and follow-up of transplant recipients to prevent the spread of infectious diseases".[6] The CDC has published guidelines on non-COVID related care,[7,8] and the OPTN recognizes that there are different levels of risk in different areas of the country. As such, the emergency policies give providers discretion on risk versus benefit when caring for candidates, living donors, and recipients regarding obtaining some OPTN policy-required testing requirements and follow up. Collecting data on the COVID-19 infectious disease testing results in DonorNet allows the OPTN to ensure it can develop policies for the testing of organ donors and follow-up of transplant recipients to prevent the spread of infectious disease, and also to determine whether additional lab tests or clinical examinations of potential donors should or must continue to be performed "to determine any contraindications for donor acceptance."[9]

[6] 22 CFR §121.4(2).
[7] https://www.cdc.gov/coronavirus/2019-ncov/hcp/framework-non-COVID-care.html
[8] https://www.cdc.gov/coronavirus/2019-ncov/need-extra-precautions/immunocompromised.html
[9] 42 C.F.R. §121.6(a).

Action 4: Incorporate COVID-19 Infectious Disease Testing into DonorNet®, is consistent with NOTA, which requires the OPTN to "collect, analyze, and publish data concerning organ donation and transplants".[10]

Additionally, Action 1: Updates to Candidate Data during 2020 COVID-19 Emergency and Action 3: Modify Wait Time Initiation for Non-Dialysis Kidney Candidates, do not change the organ allocation policy, but may impact candidates' priority on the match run. The Final Rule requires that when developing policies for the equitable allocation of cadaveric organs, such policies must be developed "in accordance with §121.8," which requires that allocation policies "(1) Shall be based on sound medical judgment; (2) Shall seek to achieve the best use of donated organs; (3) Shall preserve the ability of a transplant program to decline an offer of an organ or not to use the organ for the potential recipient in accordance with §121.7(b)(4)(d) and (e); (4) Shall be specific for each organ type or combination of organ types to be transplanted into a transplant candidate; (5) Shall be designed to avoid wasting organs, to avoid futile transplants, to promote patient access to transplantation, and to promote the efficient management of organ placement;…(8) Shall not be based on the candidate's place of residence or place of listing, except to the extent required by paragraphs (a)(1)-(5) of this section." The Action 1 and Action 3 policy changes:

- **Are based on sound medical judgment[11]** because they are evidenced-based changes relying on the following:
    - Feedback from 64 transplant hospitals and 27 OPOs[12]
    - Medical judgment that transplant candidates and recipients are likely to be at increased risk for COVID-19 infection due to their immunocompromised state and therefore permitting transplant programs to enter their most recent lab values rather than requiring the candidates to come in to obtain new lab values is a decision made with sound medical judgment.
- **Seek to achieve the best use of donated organs[13] by** ensuring organs are allocated and transplanted according to medical urgency. These proposals:
    - Maintain medical urgency statuses for candidates even if they are unable to update labs due to infectious risk or strained hospital resources.
- **Are designed to…promote patient access to transplantation[14] by** giving similarly situated candidates equitable opportunities to receive an organ offer. These proposals:
    - Prevent the system from lowering a candidate's allocation priority due to inability to obtain updated testing. Thus, candidates who have been appropriately prioritized within a status or score previously will maintain that prioritization until new clinical data can be obtained
    - Allow non-dialysis kidney candidates to accrue waiting time after a qualifying glomerular filtration rate (GFR) or creatinine clearance (CrCl), even if they are unable to complete all labs required for waiting list registration due to COVID-19 exposure risk or strained hospital resources.

[10] 42 C.F.R. §274(b)(2)(I)
[11] 42 CFR §121.8(a)(1).
[12] Appendix A: Transplant Community Request for Feedback Results
[13] 42 CFR §121.8(a)(2).
[14] 42 CFR §121.8(a)(5).

- Have potential to reduce waiting list mortality by decreasing the number of candidates exposed to COVID-19.

The Action 1 and Action 3 policy changes are not expected to impact the following aspects of the Final Rule:

- **Are designed to avoid wasting organs**[15] by decreasing the number of organs recovered but not transplanted
- **Are designed to avoid futile transplants**[16]**:** This proposal should not result in transplanting patients that are unlikely to have good post-transplant outcomes.
- **Promote the efficient management of organ placement**[17] by taking into account factors including the costs and logistics of procuring and transplanting organs
- **Are not based on the candidate's place of residence or place of listing, except to the extent required**.[18]

The Action 1 and Action 3 policy changes also preserve the ability of a transplant program to decline and offer or not use the organ for a potential recipient,[19] and are specific to each organ type.[20]

Implementation Considerations

The OPTN Executive Committee reviews these actions at every meeting, along with monitoring data on their usage by the community. The Executive Committee has so far reviewed these proposals on April 3,[21] April 20,[22] June 7,[23] and July 30, and agreed that the proposals need to remain in place at this time. At the July 30, 2020 meeting the Executive Committee voted to extend the expiration dates of the latter three actions to December 31, 2020 so that they do not expire before the full Board of Directors meeting.

The expiration dates for these policies will be assessed by the OPTN Executive Committee and Board of Directors at every meeting. Any future actions will be based on the state of the COVID-19 crisis and its impact on the transplant community, as evidenced by feedback from the community and regular data monitoring. Feedback received during public comment on whether these proposals should remain in effect, and when they should be removed, will be crucial in OPTN considerations of these actions. A policy notice will be sent to members informing of this change, as well as a systems notice if or when fields are removed from UNet[SM].

The Final Rule also requires the OPTN to "consider whether to adopt transition procedures" whenever organ allocation policies are revised.[24] The Committee did not identify any populations that may be treated "less favorably than they would have been treated under the previous policies" when discussing the adoption of these procedures on March 17 and April 3, 2020. These policies will not change organ

[15] 42 CFR §121.8(a)(5).
[16] 42 CFR §121.8(a)(5).
[17] 42 CFR §121.8(a)(5).
[18] 42 CFR §121.8(a)(8).
[19] 42 CFR §121.8(a)(3).
[20] 42 CFR §121.8(a)(4).
[21] https://optn.transplant.hrsa.gov/media/3878/optn-executive-committee-meeting-4-03-20.pdf
[22] https://optn.transplant.hrsa.gov/media/3880/20200420-optn-executive-committee-meeting-summary.pdf
[23] https://optn.transplant.hrsa.gov/media/3893/20200607-optn-executive-committee-meeting-summary.pdf
[24] 42 CFR § 121.8(d).

allocation priority, and this will only affect candidates who are potentially disadvantaged due to the public health crisis, so they are not expected to treat any populations less favorably.

Member and OPTN Operations

Operations affecting Transplant Hospitals

The primary intent of these proposals is to increase patient safety for transplant candidates, recipients, and living donors. These proposals are also intended to mitigate data entry demands in a time of increased healthcare need, as well as reduce healthcare requirements for follow up testing in areas of high medical need due to COVID-19. Hospitals should have already educated staff on the use of the COVID-19 testing field and retroactive wait time adjustment applications for non-dialysis kidney candidates. Follow up forms will automatically be marked in amnesty status, so there was no additional effort or education required from hospitals.

Operations affecting Organ Procurement Organizations

Action 4, COVID-19 testing in DonorNet®, added optional data elements. Due to concerns in the community surrounding COVID-19, these data were already being requested by accepting transplant programs. This field was intended to standardize communication for efficiency of organ offers, and to ensure that critical disease testing information about the donor was provided to transplant programs.

Operations affecting Histocompatibility Laboratories

This proposal is not anticipated to affect the operations of Histocompatibility Laboratories.

Operations affecting the OPTN

Changing data submission requirements and adding a COVID-19 testing field required significant programming effort in UNet℠. Overall, this was a large effort over a short time frame.

Action 3, Modification of Kidney Wait Time for Non-Dialysis Candidates, also requires significant Organ Center effort for wait time adjustments, depending on how widely it is utilized. From April 2019 to April 2020, the Organ Center averaged about 12 waiting time modifications per month across all organs. In May 2020 the Organ Center processed 25 COVID-19-related modifications, out of 43 total modifications.

All of the emergency actions require significant monthly monitoring effort from Research. These reviews will continue as long as the policies are active.

The UNOS Communications department has been distributing notices for system changes due to COVID-19 emergency actions, as well as periodic notices to keep the transplant community up to date on these actions as well as the general community response.

Potential Impact on Select Patient Populations

Relaxing data submission requirements could lead to fewer follow up visits and medical complications not being detected among transplant recipients and living donors. However, as a whole this is anticipated to alleviate exposure risk to COVID-19 for immunocompromised individuals.

Modifying kidney wait time for non-dialysis candidates is also intended to ensure that medically vulnerable patients and patients with limited healthcare access due to location or socioeconomic status can accrue wait time while unable to finish testing required for transplant candidate registration, as well as ensure that these candidates maintain waiting list status if they are unable to get updated labs for the same reasons as above. In addition, it is intended to reduce risk of exposure to COVID-19 for these individuals.

Post-implementation Monitoring

Member Compliance

Action 1: Updates to Candidate Data During 2020 COVID-19 Emergency

The Final Rule requires that allocation policies "include appropriate procedures to promote and review compliance including, to the extent appropriate, prospective and retrospective reviews of each transplant program's application of the policies to patients listed or proposed to be listed at the program." [25] For retrospective site survey reviews of candidate data that are used to maintain a candidate's prioritization or eligibility reported during the 2020 COVID-19 emergency:

- Site surveyors will continue to verify that candidate data entered in UNet℠ is consistent with documentation in the candidate's medical record.
- If a surveyor is unable to locate documentation in the medical record that corroborates the collection date entered in UNet, the surveyor will look for documentation that the transplant program exercised authority under Policy 1.4.F to re-report the candidate's most recently reported data on that date as the "collection date."

Action 2: Relax Data Submission Requirements for Follow-up Forms

Follow-up forms due between March 13, 2020 and December 31, 2020 will be excluded from routine compliance monitoring of data accuracy and data submission according to *Policy 18.1 Data Submission Requirements*, *Policy 18.2 Timely Collection of Data*, and *Policy 18.5 Living Donor Data Submission Requirements*.

Action 3: Modifications to Kidney Wait Time Initiation for Non-Dialysis Candidates

The Final Rule requires that allocation policies "include appropriate procedures to promote and review compliance including, to the extent appropriate, prospective and retrospective reviews of each transplant program's application of the policies to patients listed or proposed to be listed at the program." [26] The proposed language will not change the current routine monitoring of OPTN members. Any data entered in UNet℠ may be reviewed by the OPTN, and members are required to provide documentation as requested.

Action 4: COVID-19 Infectious Disease Testing in DonorNet®

As this field is not required, it will not be routinely monitored. Any data entered in UNet℠ may be reviewed by the OPTN, and members are required to provide documentation as requested.

[25] 42 CFR §121.8(a)(7).
[26] 42 CFR §121.8(a)(7).

Policy Evaluation

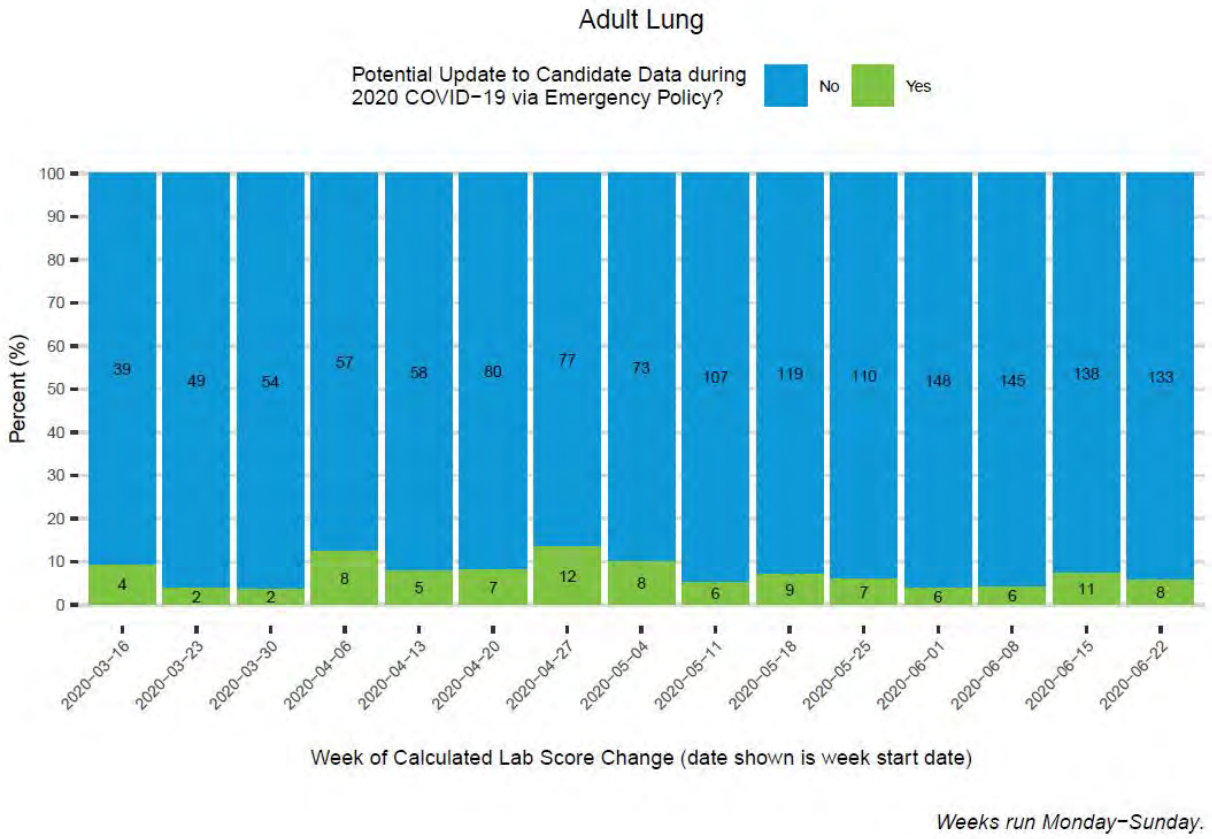
These policies are being and will continue to be reviewed on a monthly basis by UNOS Research for utilization. The Final Rule requires that allocation policies "be reviewed periodically and revised as appropriate."[27] Appendix A contains a monitoring report on updates to candidate data, data submission for follow-up forms, and modifications to wait time for non-dialysis kidney candidates. Appendix B contains a monitoring report on COVID-19 infectious disease monitoring in UNet[SM]. Both appendices contain the methods for monitoring the use of these emergency actions.

The level of utilization of these policies is not necessarily an indicator of whether or not they are effective, as the impacts of COVID-19 are variable across the country and over time.

Action 1: Updates to Candidate Data During 2020 COVID-19 Emergency

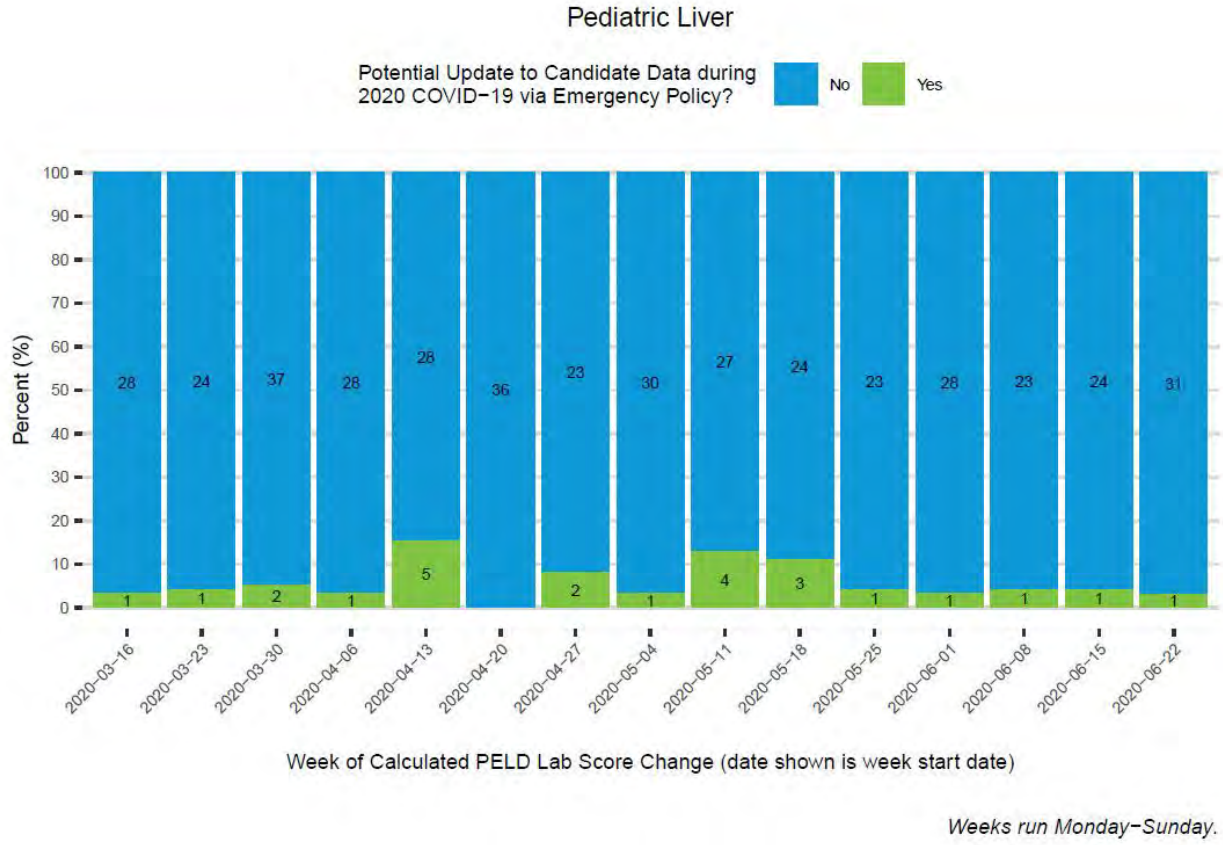
Action 1 was most utilized in adult lung and pediatric liver candidates. Figure 1 shows the utilization over time by adult lung candidates, and Figure 2 shows the utilization over time for pediatric liver candidates.

Figure 1: Emergency Action 1 Utilization in Adult Lung Candidates



[27] 42 CFR §121.8(a)(6).

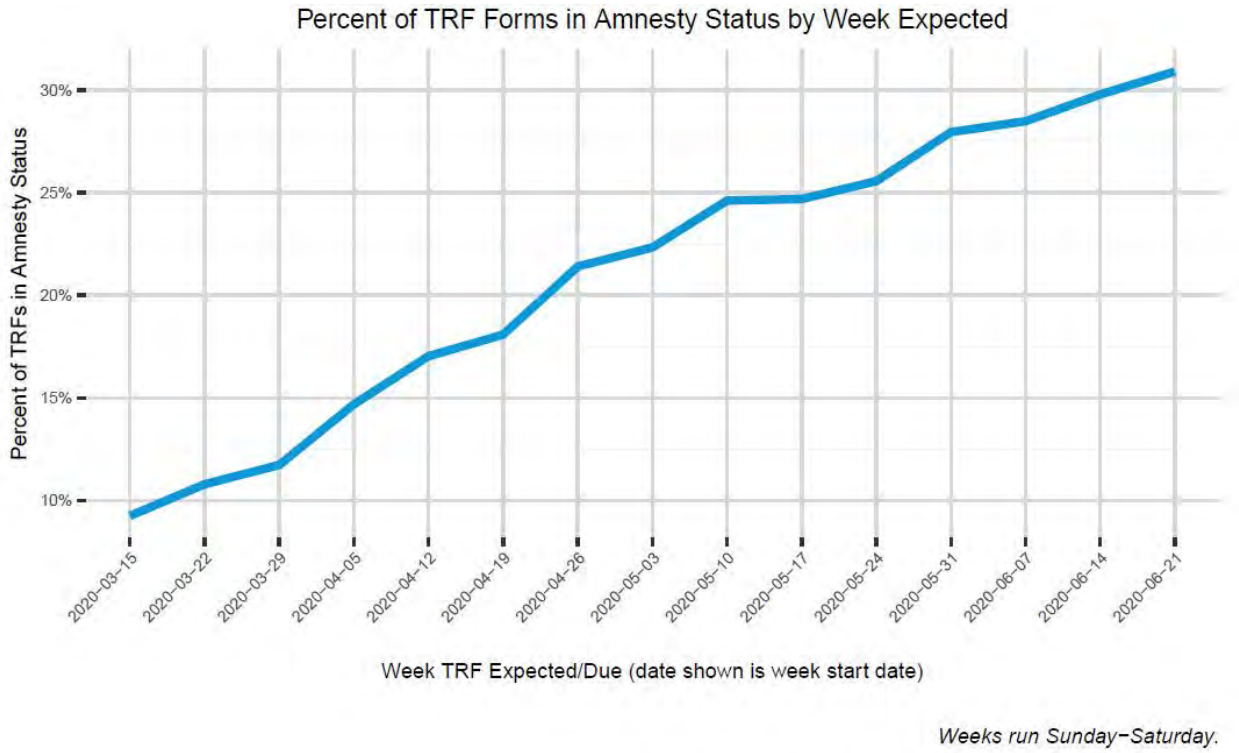
Figure 2: Emergency Action 1 Utilization in Pediatric Liver Candidates



There was only one adult heart candidate who potentially utilized this policy, and a more comprehensive data report on the utilization of this policy by various candidate populations can be found in Appendix A. This policy was only intended for use when hospitals cannot safely or logistically obtain updated labs on candidates, and with a relatively low utilization across organ types it seems likely that it is being used as intended.

Action 2: Relax Data Submission Requirements for Follow-up Forms

The percentage of follow-up forms by week expected has steadily increased over time. Below is a graph of TRF forms in amnesty status by week expected. Over 30% of TRF forms were not validated and switched into amnesty status the week of June 21, 2020. A more complete breakdown, including TRF and LDF forms in amnesty status by region and by organ, is available in Appendix A.



Action 3: Modifications to Kidney Wait Time Initiation for Non-Dialysis Candidates

Action 3 has been utilized by 48 candidates as of June 30th. The proportion of non-dialysis kidney alone candidates registered has remained fairly stable. A full breakdown of kidney alone registrations between The week of January 6, 2020 and June 22, 2020 can be found in Appendix A. There could be an increase in waiting time modifications once healthcare conditions normalize, but there appears to be a

Action 4: COVID-19 Infectious Disease Testing in DonorNet®

All deceased donors between April 21, 2020 and June 30, 2020 were tested for COVID-19. In total, the data fields have been utilized in 71.9% of deceased donors. Other methods of communication via DonorNet® included indicating testing in free text fields or attached testing results. A more complete breakdown by week and method of reporting can be found in Appendix B.

Conclusion

This public comment consists of four proposals that were approved as emergency actions:

- Updating Candidate Data During 2020 COVID-19 Emergency
- Relax Data Submission Requirements for Follow-up Forms
- Modify Wait Time Initiation for Non-Dialysis Kidney Candidates
- Incorporate COVID-19 Infectious Disease Testing into DonorNet®

Each of these proposals is intended to address a specific concern of the transplant community pertaining to operational effects of the COVID-19 emergency. The OPTN is seeking the following feedback on these proposals, for relevance and to gauge current and future need of the transplant community.

- Were the Executive Committee's actions appropriate in the emergency?
- Should the Board of Directors select a date for the expiration of the emergency actions, or should they delegate the repeal to the Executive Committee based on review of the changing environment?
- Should COVID-19 infectious disease testing remain in DonorNet?
- Should the COVID-19 infectious disease data fields become mandatory in DonorNet?
- Should the OPTN require retrospective data entry on follow-up forms given amnesty status under the emergency policies?
- Are there other things the OPTN should have done, or can still do, to respond to the COVID-19 crisis?
- Is the emergency policy process utilized by the OPTN the most appropriate way to respond to an emerging health crisis?
- Additional feedback and recommendations are appreciated.

Appendix A: COVID-19 Emergency Actions Monitoring Methods

Data Source

OPTN data analyzed are as of July 1, 2020 and subject to change based on future data submission or correction.

Methods and Cohort:

Updates to Candidate Data during 2020 COVID-19 Emergency

Adult (age 12 and older) Liver:

The following database fields that have associated dates are required reporting for the re-certification and calculation of MELD labs for candidates age 12 and older: Serum Creatinine, had dialysis twice (24 hours of CVVHD within a week prior to the Serum Creatinine test), Serum Sodium, Bilirubin or Bilirubin (PBC/PSC/Other Cholestatic), and INR.

All instances of a modification to the labs or their corresponding dates, for waiting list registrations of liver candidates age 12 and older since implementation of the policy on March 17, 2020 at 7pm EST, were reviewed.

Waiting list registrations were flagged as potential users of this policy based on the following (with the exception of the dialysis field since the OPTN does not collect a date for this):

- The change date for the calculated MELD lab score is on or after March 17, 2020 at 7pm EST, and
- The change date for the calculated MELD lab score is different than the prior entry, and
- The dates for all required labs for the calculated MELD lab score have changed, and
- None of the values for the required labs have changed.

Pediatric (age 11 and younger) Liver:

The following database fields that have associated dates are required reporting for the re-certification and calculation of PELD labs for candidates age 11 and younger: Albumin, Bilirubin or Bilirubin (PBC/PSC/Other Cholestatic), and INR.

All instances of a modification to the labs or their corresponding dates, for waiting list registrations of liver candidates age 11 and younger since implementation of the policy on March 17, 2020 at 7pm EST, were reviewed.

Waiting list registrations were flagged as potential users of this policy based on the following (with the exception of the dialysis field since the OPTN does not collect a date for this):

- The change date for the calculated PELD lab score is on or after March 17, 2020 at 7pm EST, and
- The change date for the calculated PELD lab score is different than the prior entry, and
- The dates for all required labs for the calculated PELD lab score have changed, and
- The values for none of the required labs have changed.

Adult/Adolescent (age 12 and older) Lung:

The following groups of database fields that have associated dates are required reporting for the recertification and calculation of LAS labs for candidates age 12 and older: CVP (central venous pressure), Hgb/Hct Test, Pulmonary.

Function Testing Results (including FVC and FEV data), Bilirubin and Creatinine, Blood Gas information (including pH, pCO2, and PO2), and Heart Catheterization results (including Pulmonary Artery Systolic/Diastolic Pressures, Mean Pulmonary Artery Pressure, Cardiac Output, and Cardiac Index).

All instances of a modification to the labs in each section or their corresponding dates, for waiting list registrations of lung candidates age 12 and older since implementation of the policy on March 17, 2020 at 7pm EST, were reviewed. Waiting list registrations were flagged as potential users of this policy if the following occurred in any one of the groups of testing results:

- The date of modification to the LAS elements is on or after March 17, 2020 at 7pm EST, and
- The given lab date for one of the group of elements is different than the prior entry and the same as the date of the modification, and
- The values for all the elements in the corresponding group have not changed from the prior entry.

Pediatric (age 11 and younger) Lung:

The following groups of database fields that have associated dates are required reporting for the recertification and calculation of pediatric Priority 1 Status for candidates age 11 and younger: Blood Gas information (including pH, pCO2, and PO2) and Heart Catheterization results (including Pulmonary Artery Systolic/Diastolic Pressures, Mean Pulmonary Artery Pressure, Cardiac Output, and Cardiac Index).

All instances of a modification to the labs in each section or their corresponding dates, for waiting list registrations of lung candidates age 11 and younger in pediatric Priority Status 1 since implementation of the policy on March 17, 2020 at 7pm EST, were reviewed. Waiting list registrations were flagged as potential users of this policy if the following occurred in any one of the groups of testing results:

- The date of modification to the elements used in determination of Priority 1 status is on or after March 17, 2020 at 7pm EST, and
- The given lab date for one of the group of elements is different than the prior entry, and
- The values for all the elements in the corresponding group have not changed from the prior entry.

Adult (age 18 and older) Heart:

The following groups of database fields that have associated dates are required reporting for the recertification of heart statuses for candidates age 18 and older:

- Status 1: Criteria 1 (hemodynamics, without hemodynamics), or
- Status 2: Criteria 1 (MAP and CI and PCW and SvO2) or Criteria 4 (hemodynamics, without hemodynamics) or Criteria 5 (hemodynamics, without hemodynamics), or
- Status 3: Criteria 2 (CI and PCW and SBP) or Criteria 5 (Therapies A and/or B), or
- Status 4: Criteria 2 (CI and PCW), or

- Statuses 5 and 6 do not have labs that require accompanying dates entries: Criteria 1 (hemodynamics, without hemodynamics).

All instances of a modification to the required labs or their corresponding dates, for waiting list registrations of heart candidates age 18 and older since implementation of the policy on March 17, 2020 at 7pm EST, were reviewed. Waiting list registrations were flagged as potential users of this policy based on the following:

- The change date for the adult heart justification form is on or after March 17, 2020 at 7pm EST, and
- The adult heart justification form is to qualify the candidate for the same status as the previously submitted form (but can be for different criteria within the same status), and
- The change date for the adult heart justification form is different than the date for the previous justification form, and
- The values for all the labs within criteria that were required on the previous adult heart justification form have not changed.

Only candidates remaining in the same status were considered; justification forms to move from one status to another were not tabulated.

Modifications to wait time initiation for non-dialysis kidney candidates

Adult kidney/kidney-pancreas registrations added to waiting list that indicate no dialysis but have a CrCl/GFR of <= 20 when added to the waiting list (i.e. at listing) from January 6, 2020 to present. Dialysis indication was based on data reported to the OPTN only.

Waiting time modification forms submitted to the UNOS Organ Center were counted for each month based on submission date, and the percentage of COVID-19 specific requests out of all requests was computed.

Relax data submission requirements

All TRF (transplant recipient follow-up), LDF (living donor follow-up), and PTM (post-transplant malignancy) forms due/expected between January 5, 2020 and present were compiled. Data around the percent of forms in an amnesty status is limited to those forms with a due date/expected date on or after March 15, 2020, the week in which the policy change occurred. Reporting of graft failures and patient deaths on TRF forms were compiled based on the date the form was validated since it can be from the original standard follow-up form. Data were stratified by form validation type, organ type, OPTN Region of responsible transplant program, and week form due. Reports of recipient graft failure and death were also displayed by week form validated and the median days from event (graft failure or patient death) to form validation to assess the impact of lengthening the requirement for reporting of these events from 14 to 30 days.

Results

Updates to Candidate Data During 2020 COVID-19 Emergency

The following sets of graphics and tables shows the number and percent of candidates that appear to use the emergency policy, allowing them to carry labs forward to maintain their wait list status. In general, there appears to be low usage of this policy across all organs/age groups examined. The data presented are the maximum count we can identify, but it's possible that candidates may have had their labs redone and returned the same values, which the OPTN cannot identify.

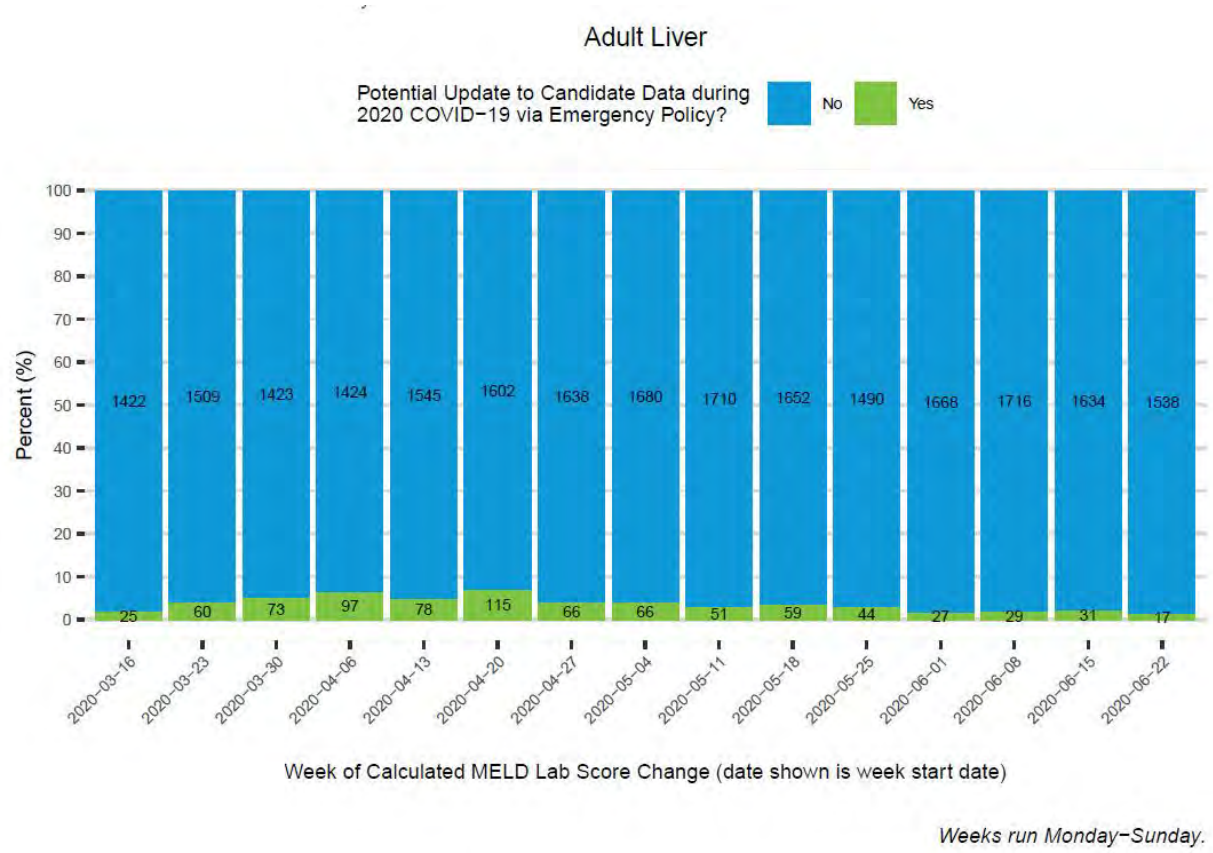
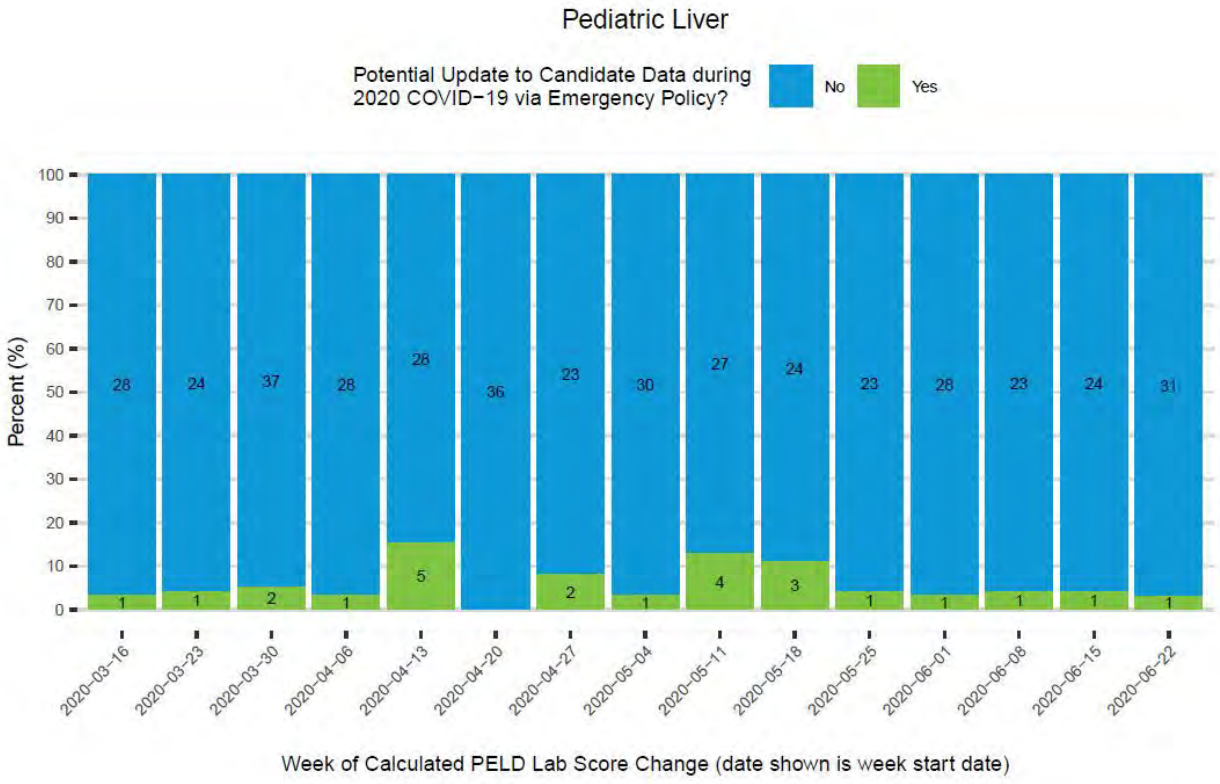


Table 1: Adult Liver Candidate Labs

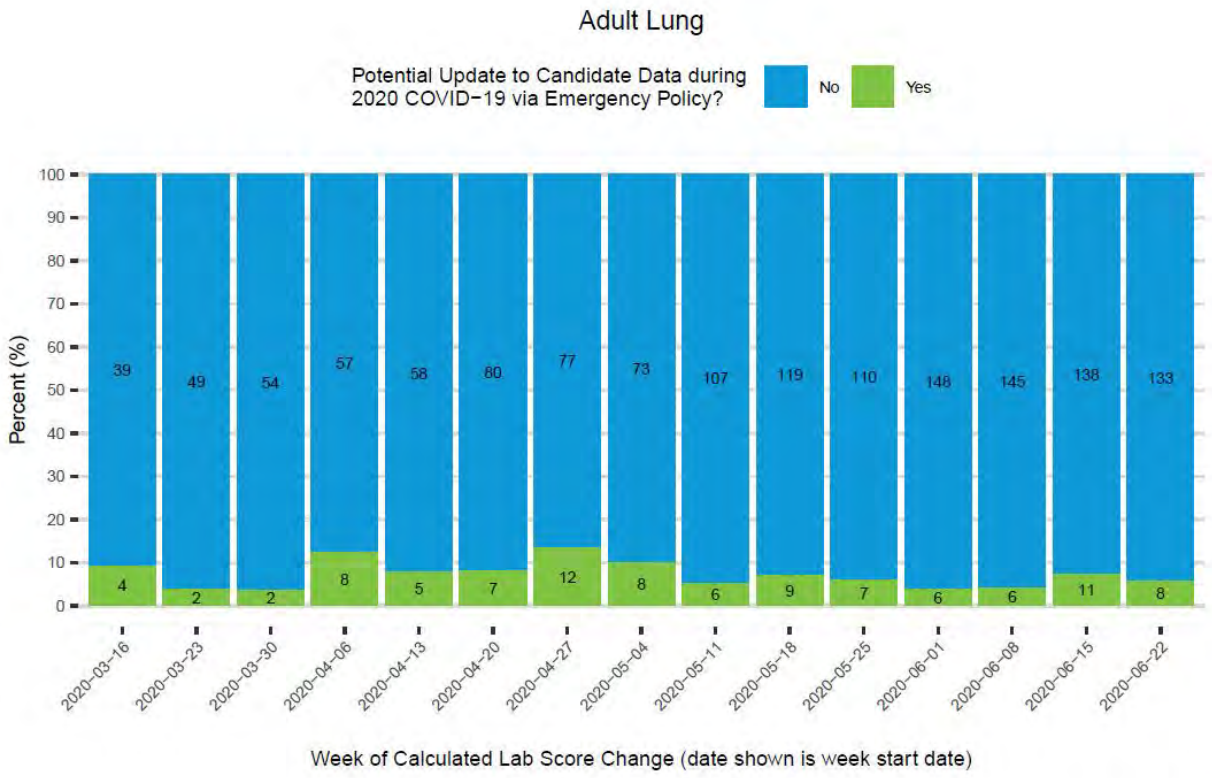
	Potential Emergency Policy for Calculated Lab MELD	
Week (start)	No	Yes
2020-03-16	1422 (98%)	25 (2%)
2020-03-23	1509 (96%)	60 (4%)
2020-03-30	1423 (95%)	73 (5%)
2020-04-06	1424 (94%)	97 (6%)
2020-04-13	1545 (95%)	78 (5%)
2020-04-20	1602 (93%)	115 (7%)
2020-04-27	1638 (96%)	66 (4%)
2020-05-04	1680 (96%)	66 (4%)
2020-05-11	1710 (97%)	51 (3%)
2020-05-18	1652 (97%)	59 (3%)
2020-05-25	1490 (97%)	44 (3%)
2020-06-01	1668 (98%)	27 (2%)
2020-06-08	1716 (98%)	29 (2%)
2020-06-15	1634 (98%)	31 (2%)
2020-06-22	1538 (99%)	17 (1%)



Weeks run Monday−Sunday.

Table 2: Pediatric Liver Candidate Labs

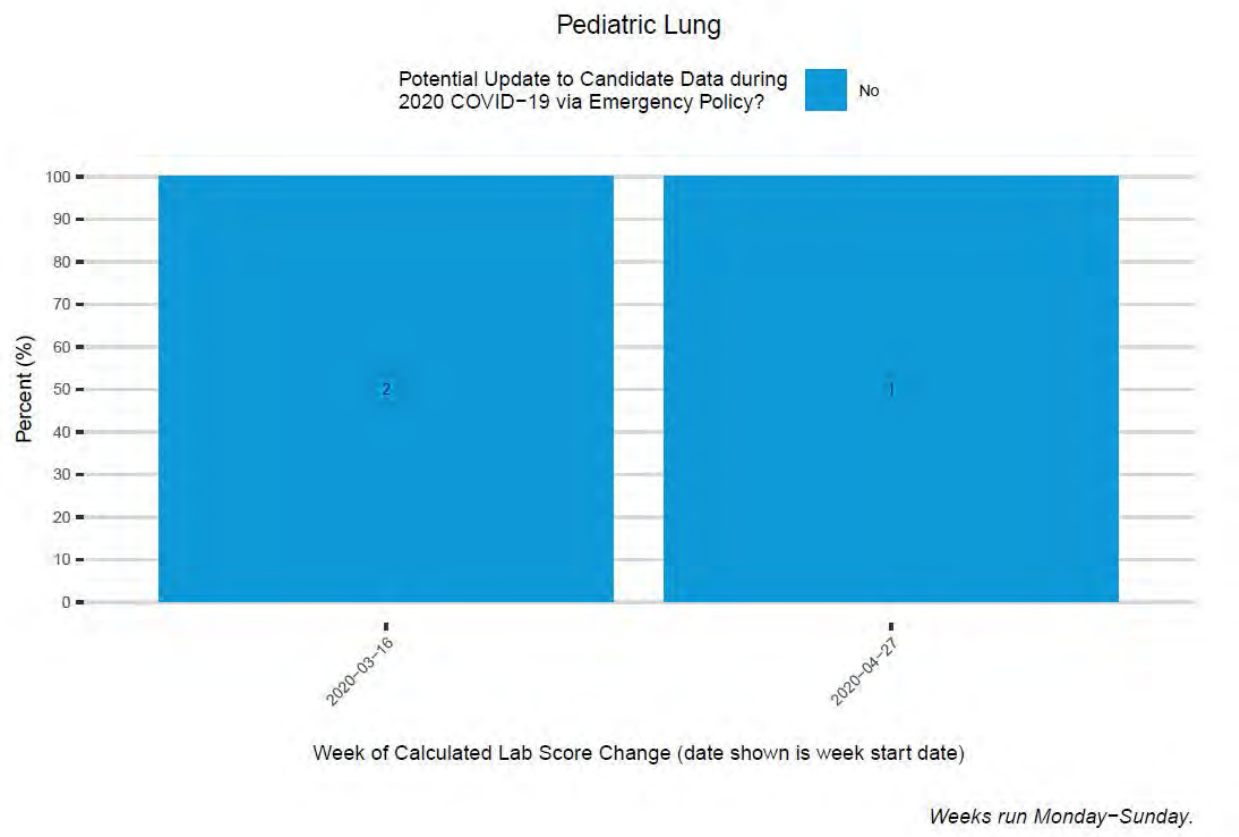
	Potential Emergency Policy for Calculated Lab PELD	
Week (start)	No	Yes
2020-03-16	28 (97%)	1 (3%)
2020-03-23	24 (96%)	1 (4%)
2020-03-30	37 (95%)	2 (5%)
2020-04-06	28 (97%)	1 (3%)
2020-04-13	28 (85%)	5 (15%)
2020-04-20	36 (100%)	0 (0%)
2020-04-27	23 (92%)	2 (8%)
2020-05-04	30 (97%)	1 (3%)
2020-05-11	27 (87%)	4 (13%)
2020-05-18	24 (89%)	3 (11%)
2020-05-25	23 (96%)	1 (4%)
2020-06-01	28 (97%)	1 (3%)
2020-06-08	23 (96%)	1 (4%)
2020-06-15	24 (96%)	1 (4%)
2020-06-22	31 (97%)	1 (3%)



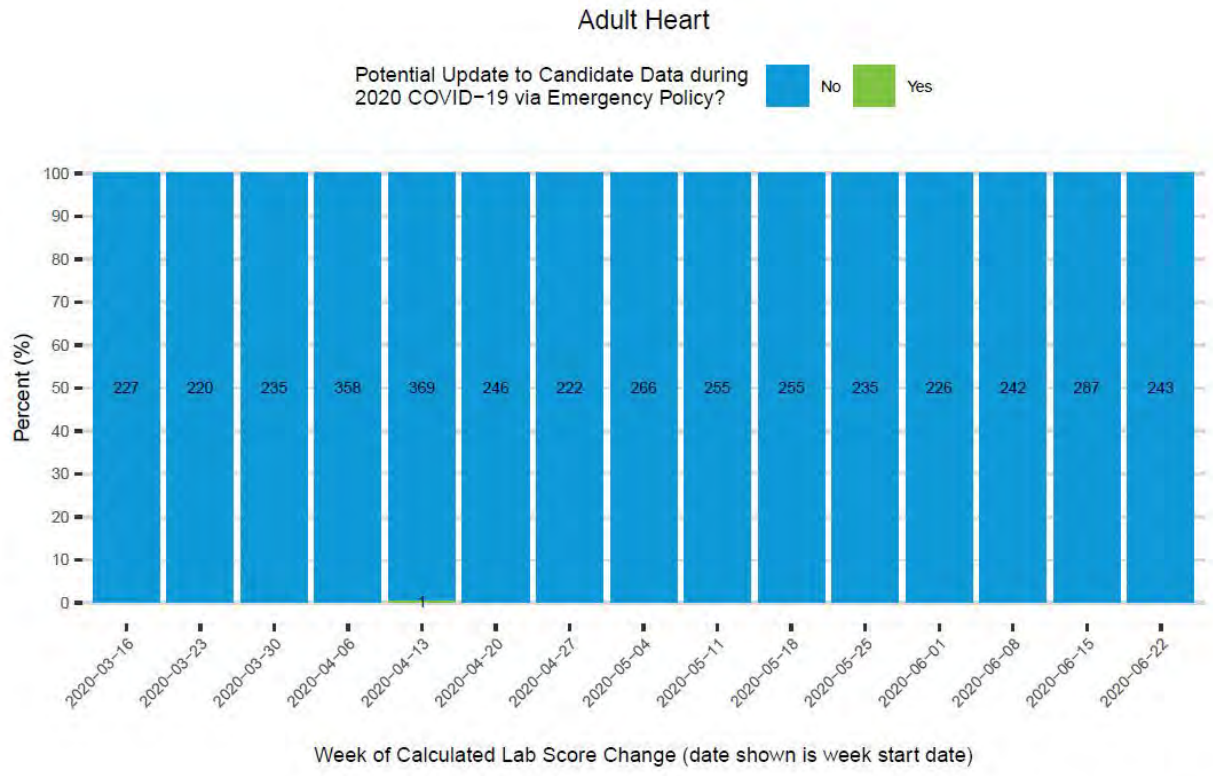
Weeks run Monday−Sunday.

Table 3: Adult Lung Candidate Labs

	Potential Emergency Policy for Calculated Labs	
Week (start)	No	Yes
2020-03-16	39 (91%)	4 (9%)
2020-03-23	49 (96%)	2 (4%)
2020-03-30	54 (96%)	2 (4%)
2020-04-06	57 (88%)	8 (12%)
2020-04-13	58 (92%)	5 (8%)
2020-04-20	80 (92%)	7 (8%)
2020-04-27	77 (87%)	12 (13%)
2020-05-04	73 (90%)	8 (10%)
2020-05-11	107 (95%)	6 (5%)
2020-05-18	119 (93%)	9 (7%)
2020-05-25	110 (94%)	7 (6%)
2020-06-01	148 (96%)	6 (4%)
2020-06-08	145 (96%)	6 (4%)
2020-06-15	138 (93%)	11 (7%)
2020-06-22	133 (94%)	8 (6%)



No table is provided for pediatric lung due to small sample size.



Weeks run Monday−Sunday.

Table 4: Adult Heart Candidate Labs

	Potential Emergency Policy for Calculated Labs	
Week (start)	No	Yes
2020-03-16	227 (100%)	0 (0%)
2020-03-23	220 (100%)	0 (0%)
2020-03-30	235 (100%)	0 (0%)
2020-04-06	358 (100%)	0 (0%)
2020-04-13	369 (100%)	1 (0%)
2020-04-20	246 (100%)	0 (0%)
2020-04-27	222 (100%)	0 (0%)
2020-05-04	266 (100%)	0 (0%)
2020-05-11	255 (100%)	0 (0%)
2020-05-18	255 (100%)	0 (0%)
2020-05-25	235 (100%)	0 (0%)
2020-06-01	226 (100%)	0 (0%)
2020-06-08	242 (100%)	0 (0%)
2020-06-15	287 (100%)	0 (0%)
2020-06-22	243 (100%)	0 (0%)

Modifications to Wait Time Initiation for Non-Dialysis Kidney Candidates

The next set of graphics and tables show the number of adult (18+) kidney alone registrations. The proportion of candidates that were non-dialysis (i.e. qualified for waiting time through eGFR or Creatinine Clearance thresholds) remained stable.

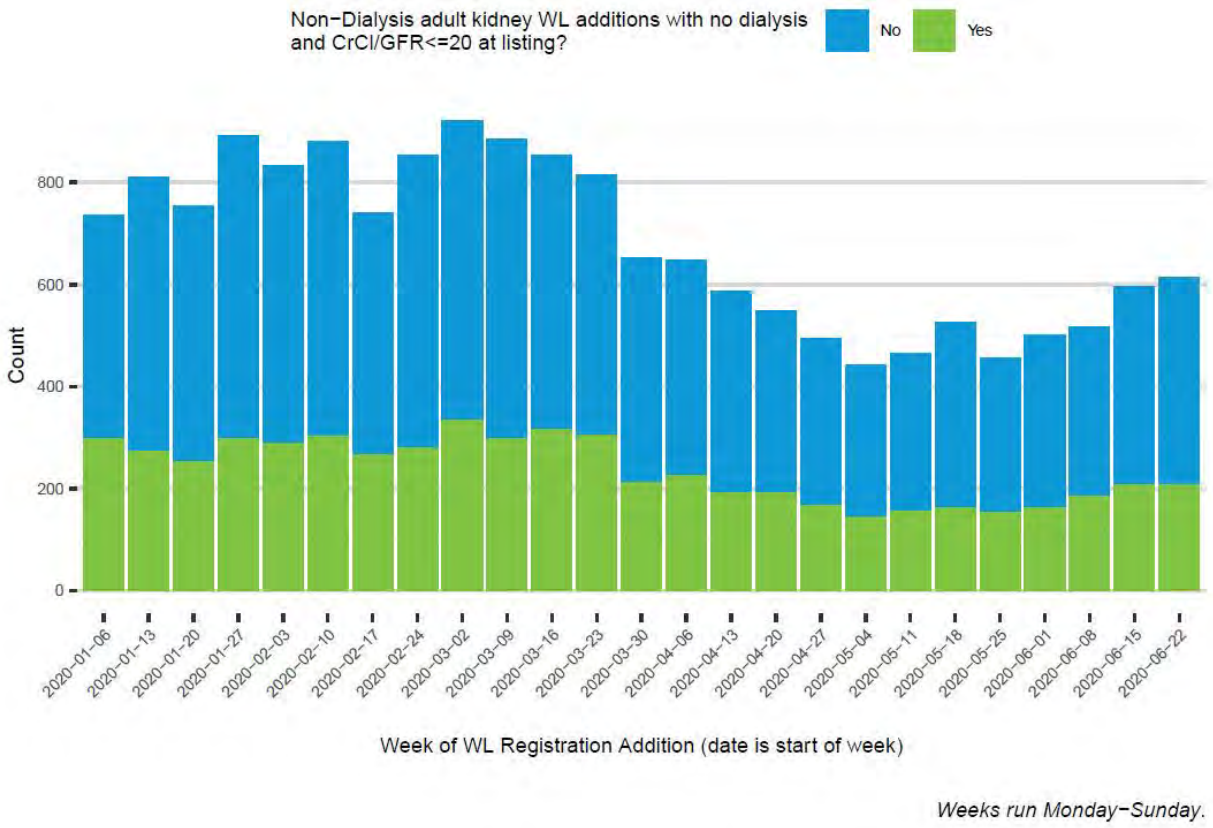
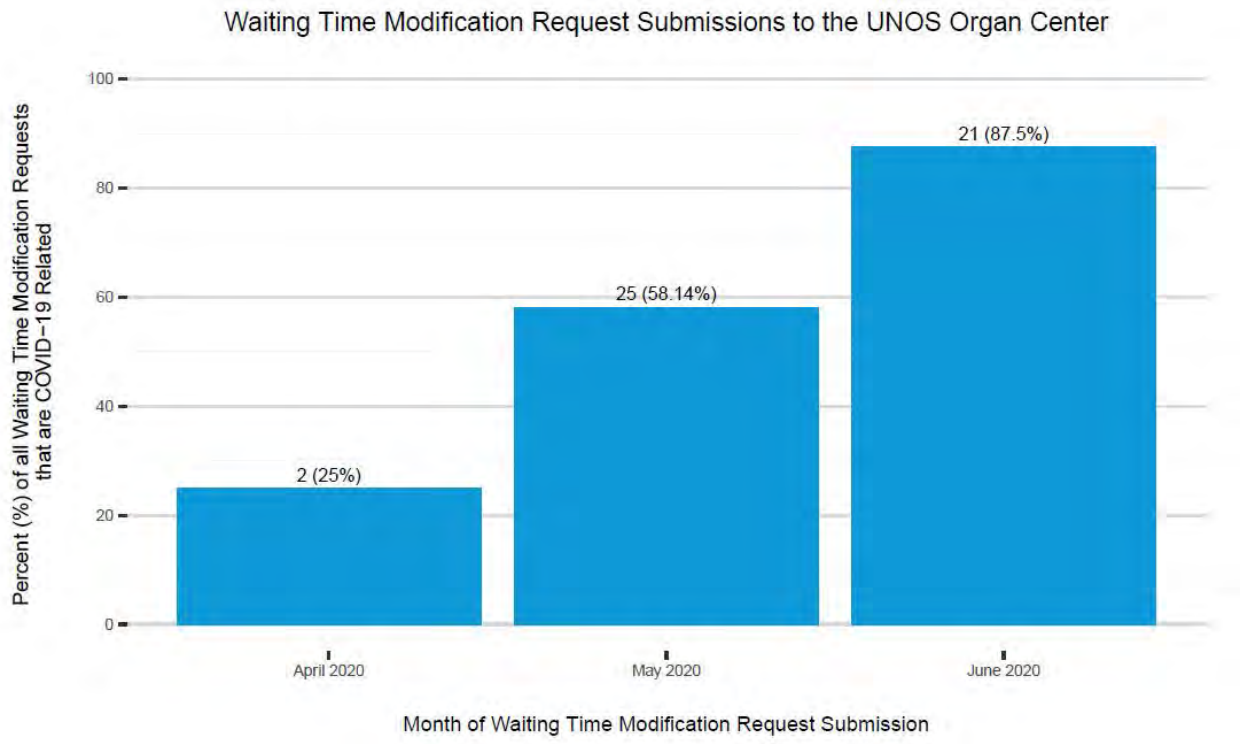


Table 5: Non-Dialysis Adult Kidney WL Additions

	Non-Dialysis adult kidney WL additions with no dialysis and CrCl/GFR<=20 at listing?	
Week (start)	No	Yes
2020-01-06	440 (59.7%)	297 (40.3%)
2020-01-13	537 (66.3%)	273 (33.7%)
2020-01-20	502 (66.6%)	252 (33.4%)
2020-01-27	596 (66.7%)	297 (33.3%)
2020-02-03	544 (65.2%)	290 (34.8%)
2020-02-10	579 (65.7%)	302 (34.3%)
2020-02-17	474 (64%)	267 (36%)
2020-02-24	575 (67.3%)	279 (32.7%)
2020-03-02	587 (63.7%)	335 (36.3%)
2020-03-09	587 (66.3%)	298 (33.7%)
2020-03-16	537 (62.9%)	317 (37.1%)
2020-03-23	511 (62.7%)	304 (37.3%)
2020-03-30	440 (67.4%)	213 (32.6%)
2020-04-06	423 (65.3%)	225 (34.7%)
2020-04-13	396 (67.3%)	192 (32.7%)
2020-04-20	357 (65%)	192 (35%)
2020-04-27	327 (66.2%)	167 (33.8%)
2020-05-04	298 (67.4%)	144 (32.6%)
2020-05-11	311 (66.7%)	155 (33.3%)
2020-05-18	364 (69.2%)	162 (30.8%)
2020-05-25	304 (66.5%)	153 (33.5%)
2020-06-01	339 (67.7%)	162 (32.3%)
2020-06-08	332 (64.2%)	185 (35.8%)
2020-06-15	388 (65.1%)	208 (34.9%)
2020-06-22	408 (66.3%)	207 (33.7%)

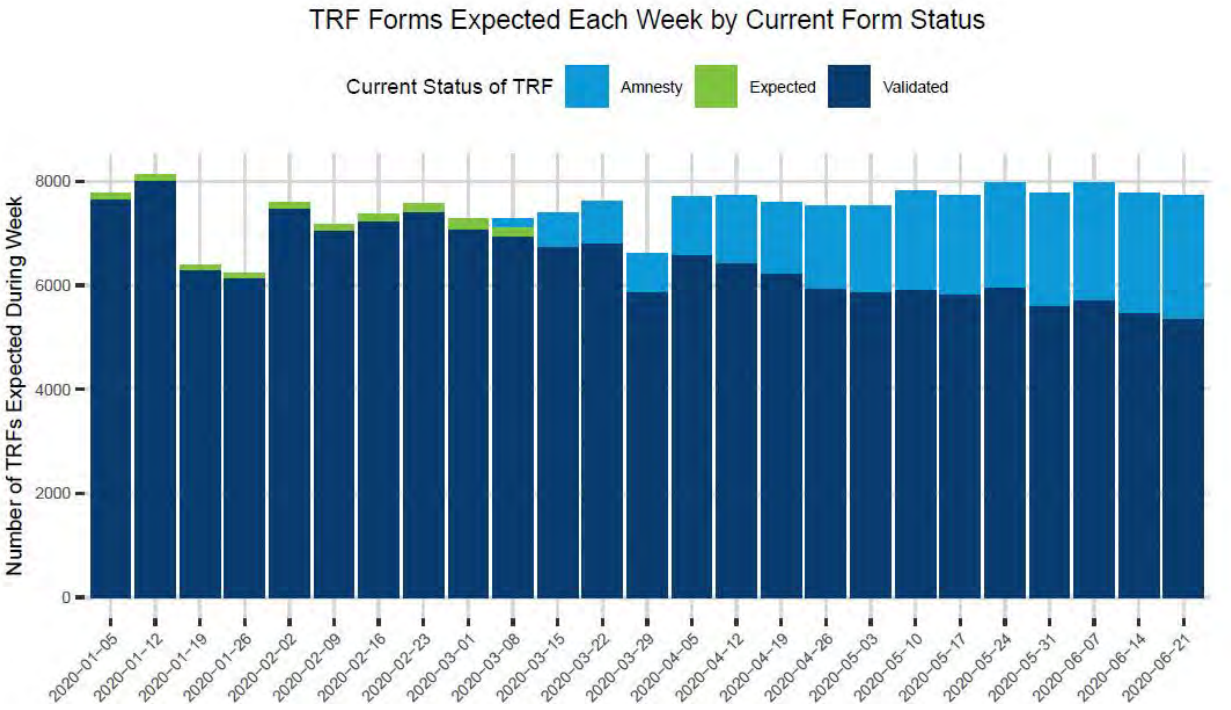
The next graphic shows the number and percent of waiting time modification request forms submitted by month to the UNOS Organ Center that were related to COVID-19, meaning the candidate could be ready for registration during COVID-19 but unable to begin accruing waiting time per OPTN *Policy 8.4: Waiting Time* if they weren't able to obtain other testing required for registration during this time.

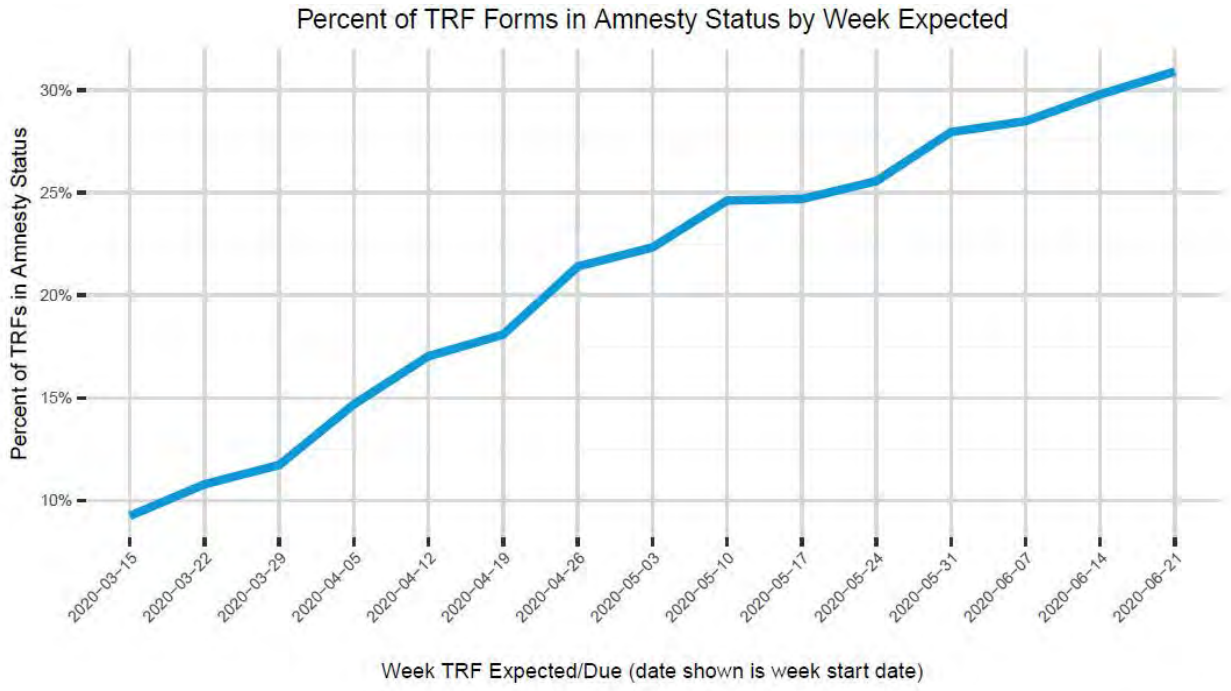


Relax Data Submission Requirements

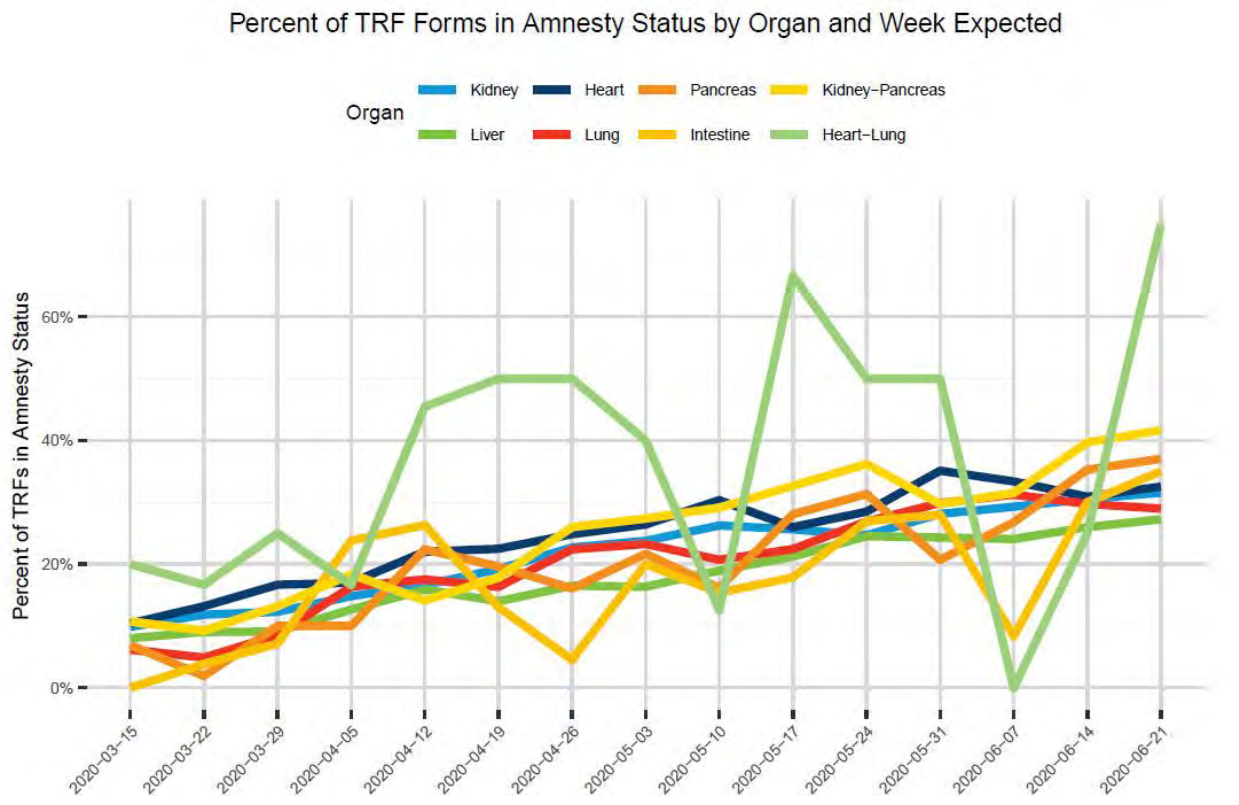
For any form with an expected due date between March 13, 2020 and December 31, 2020, the form will automatically switch into amnesty status if not validated by the due date.

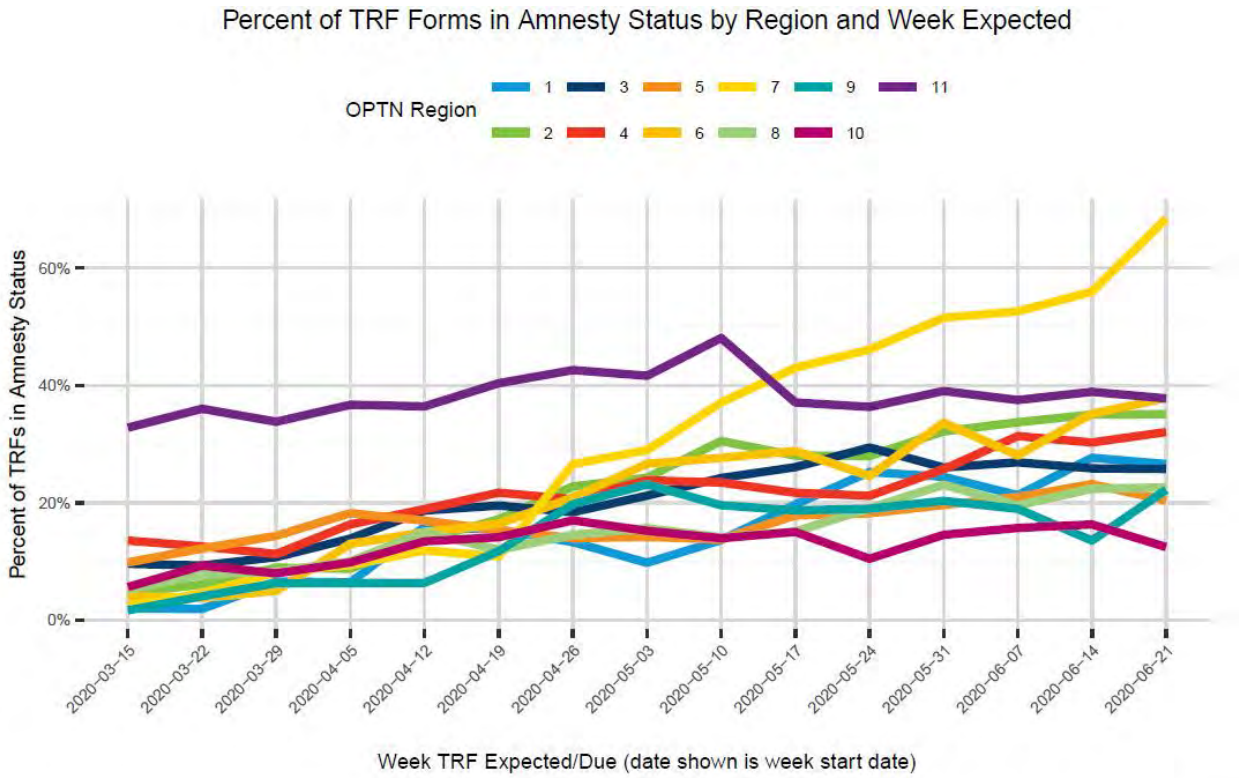
The following set of graphics show the number and percent of transplant recipient follow-up (TRF) forms in amnesty status by week, OPTN region, and organ. The number of forms with expected dates that move into amnesty status is increasing over time since policy implementation.





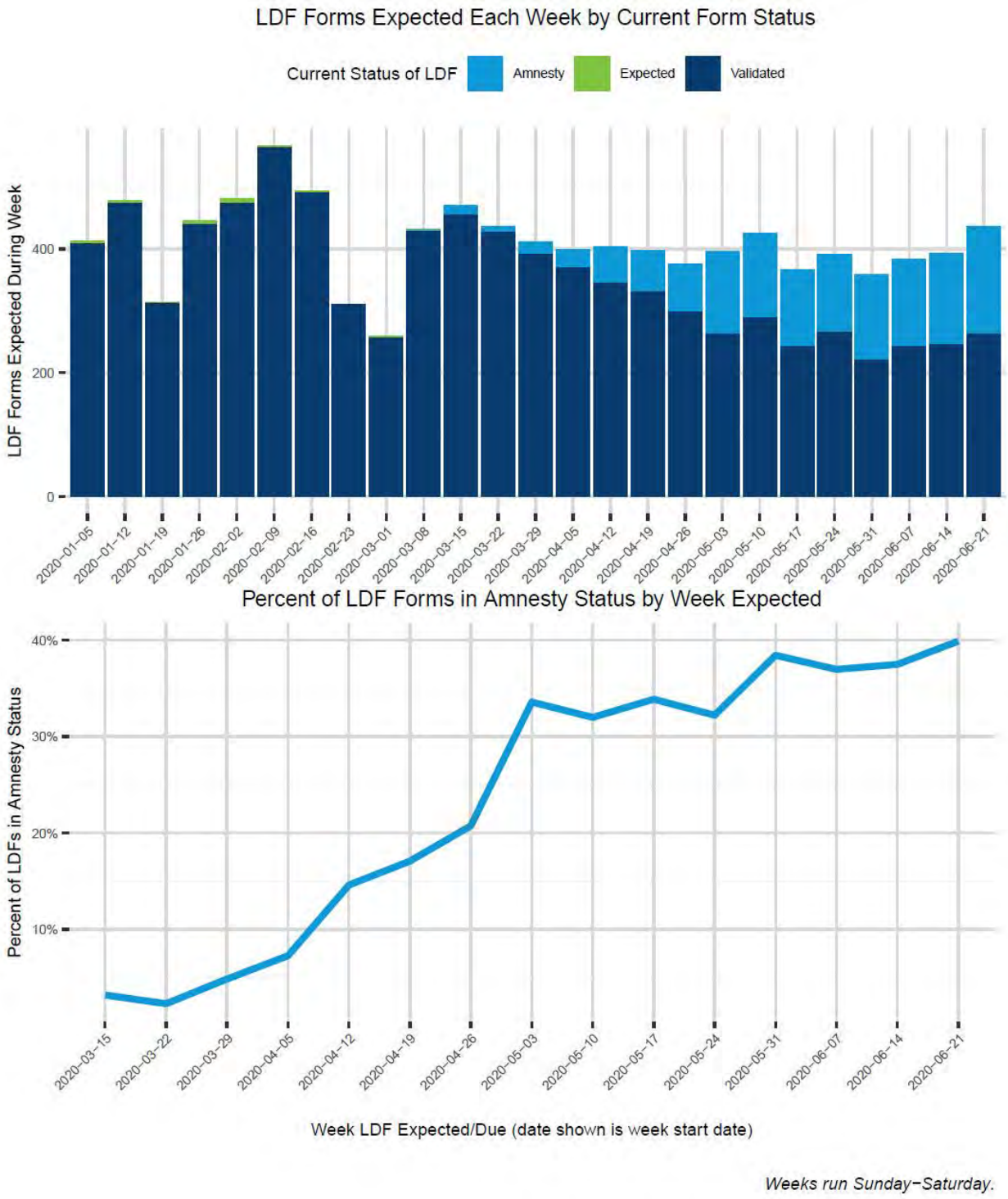
Weeks run Sunday–Saturday.

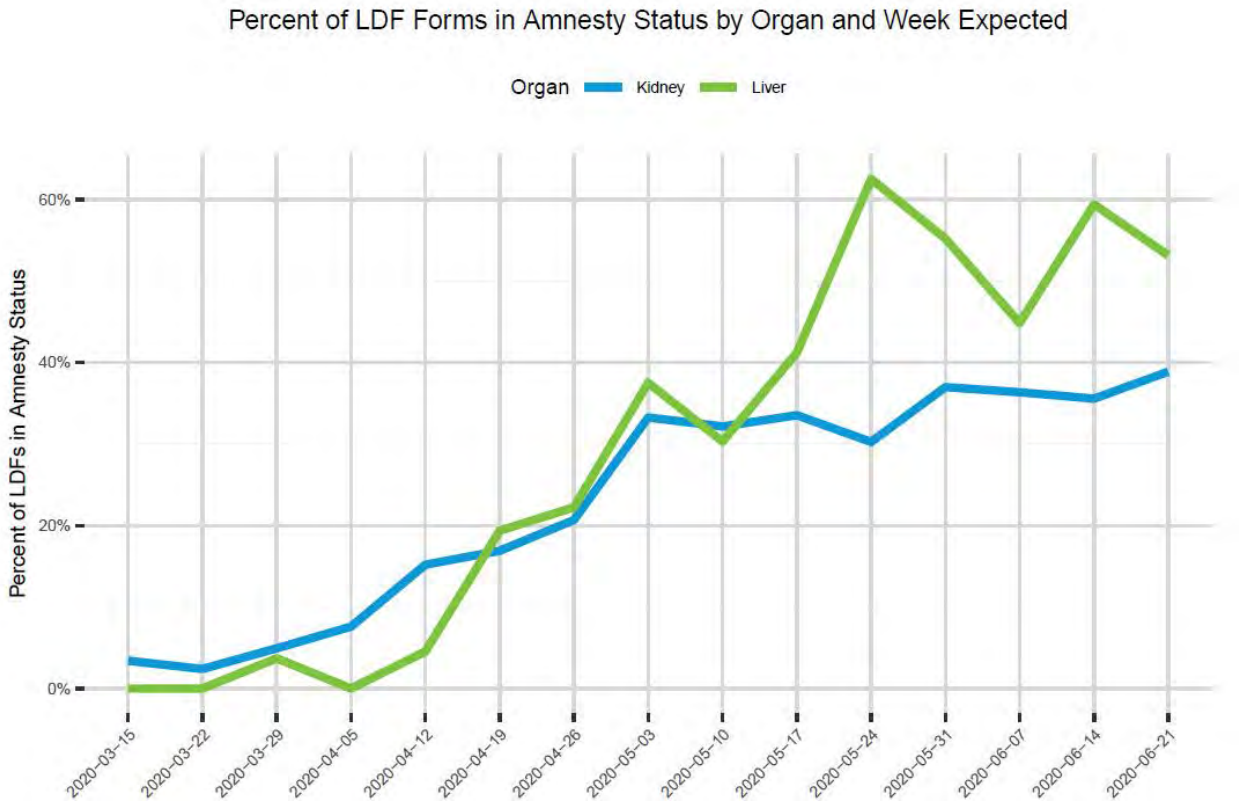


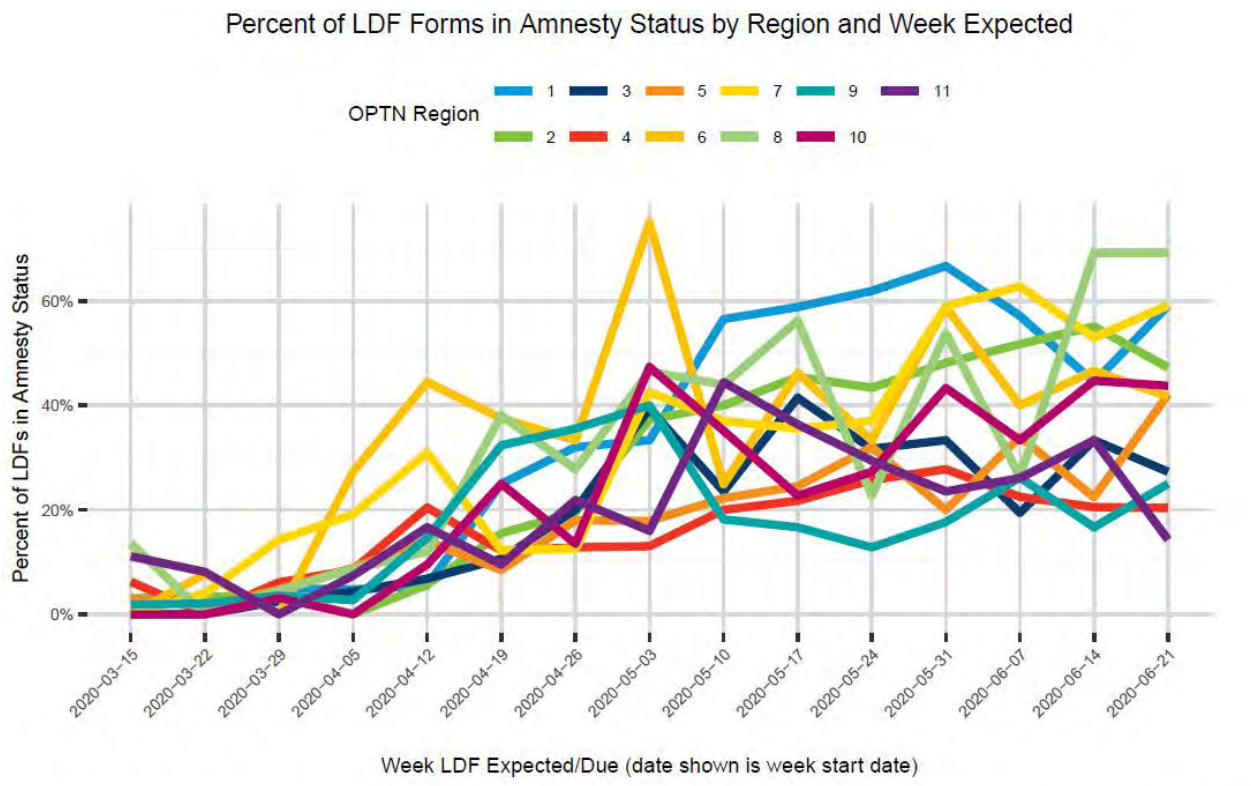


Weeks run Sunday–Saturday.

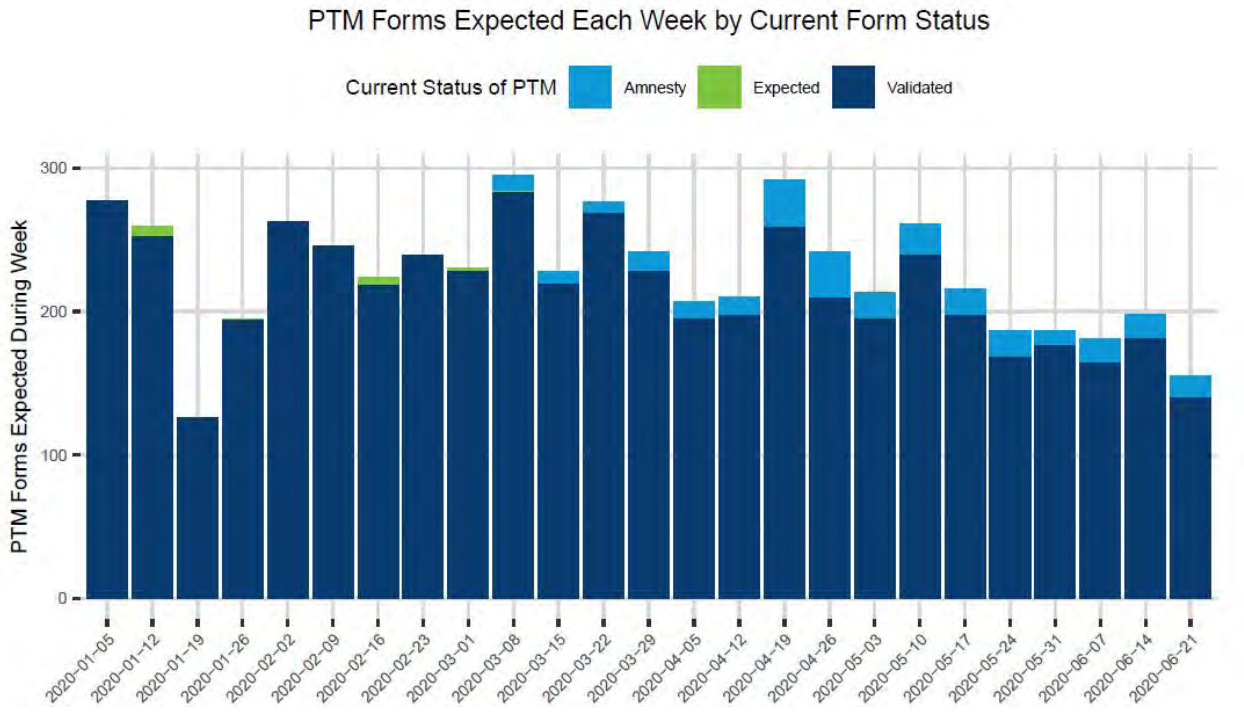
The following set of graphics show the number and percent of living donor follow-up (LDF) forms in amnesty status by week, OPTN region, and organ. The number of forms with expected dates that move into amnesty status is increasing over time since policy implementation.

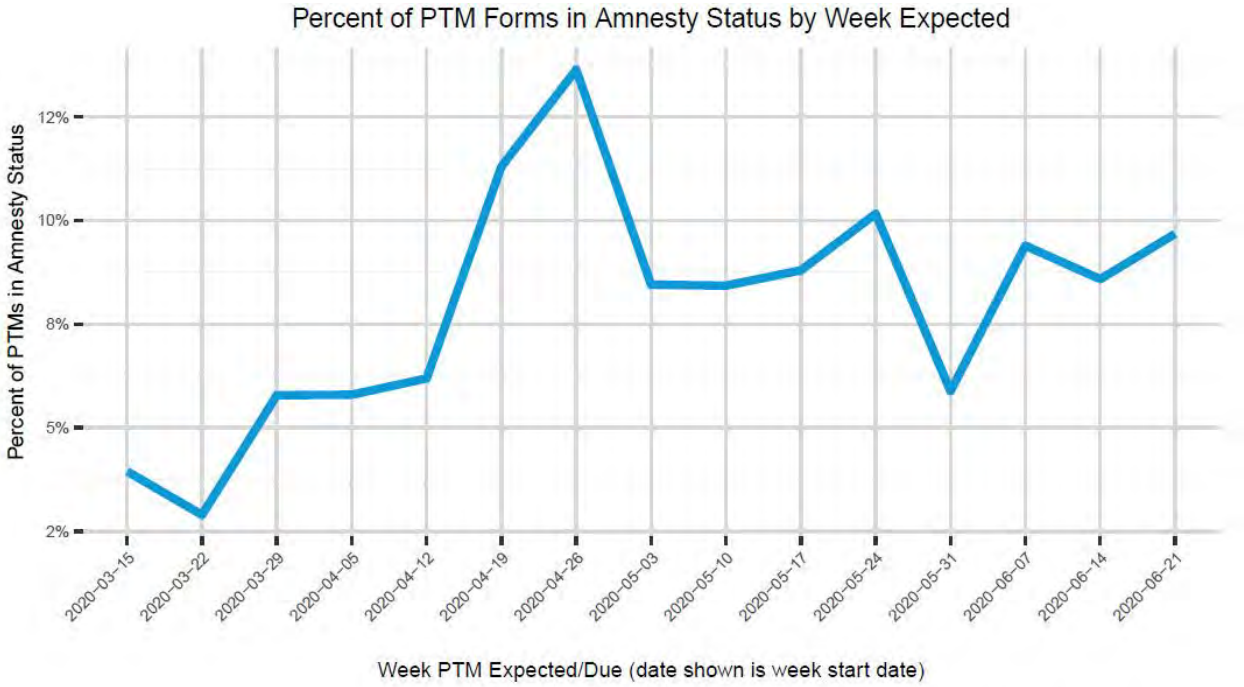



Percent of LDF Forms in Amnesty Status by Organ and Week Expected
Organ
Kidney
Liver
Percent of LDFs in Amnesty Status
60%
40%
20%
0%
2020-03-15
2020-03-22
2020-03-29
2020-04-05
2020-04-12
2020-04-19
2020-04-26
2020-05-03
2020-05-10
2020-05-17
2020-05-24
2020-05-31
2020-06-07
2020-06-14
2020-06-21

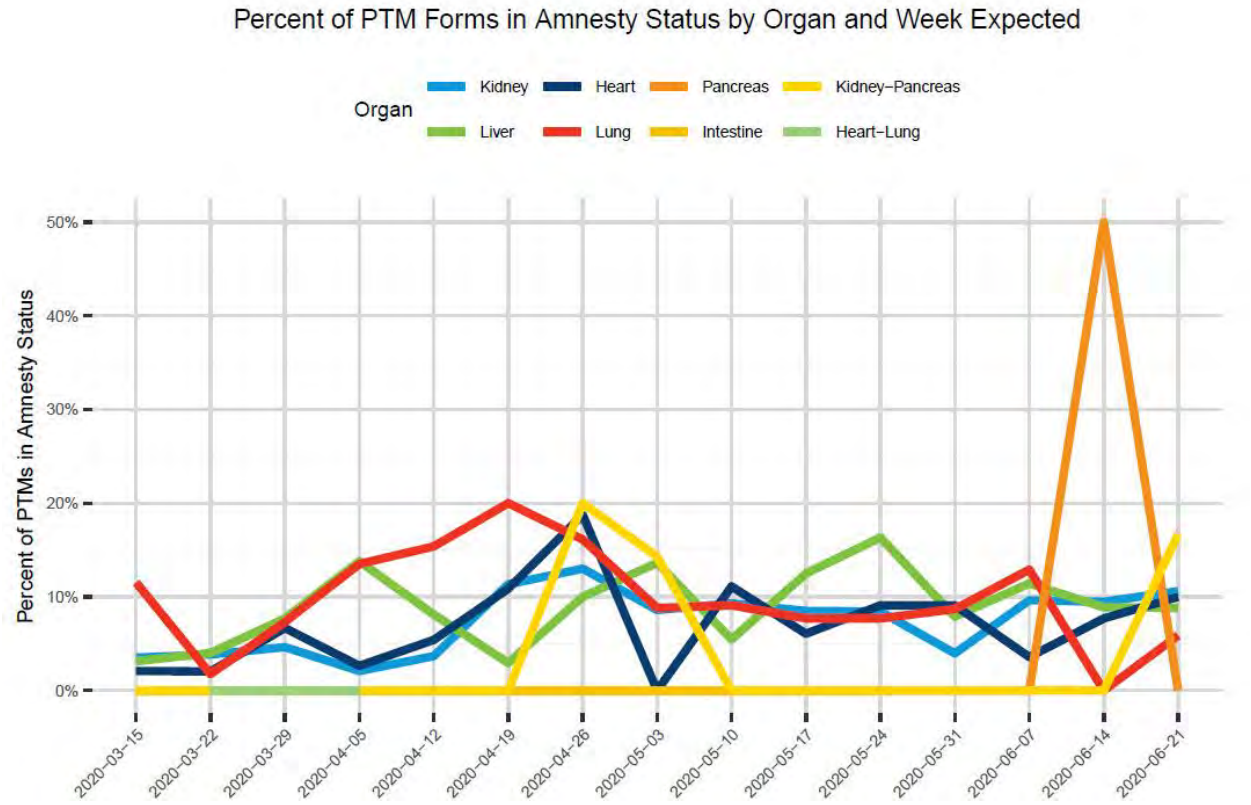


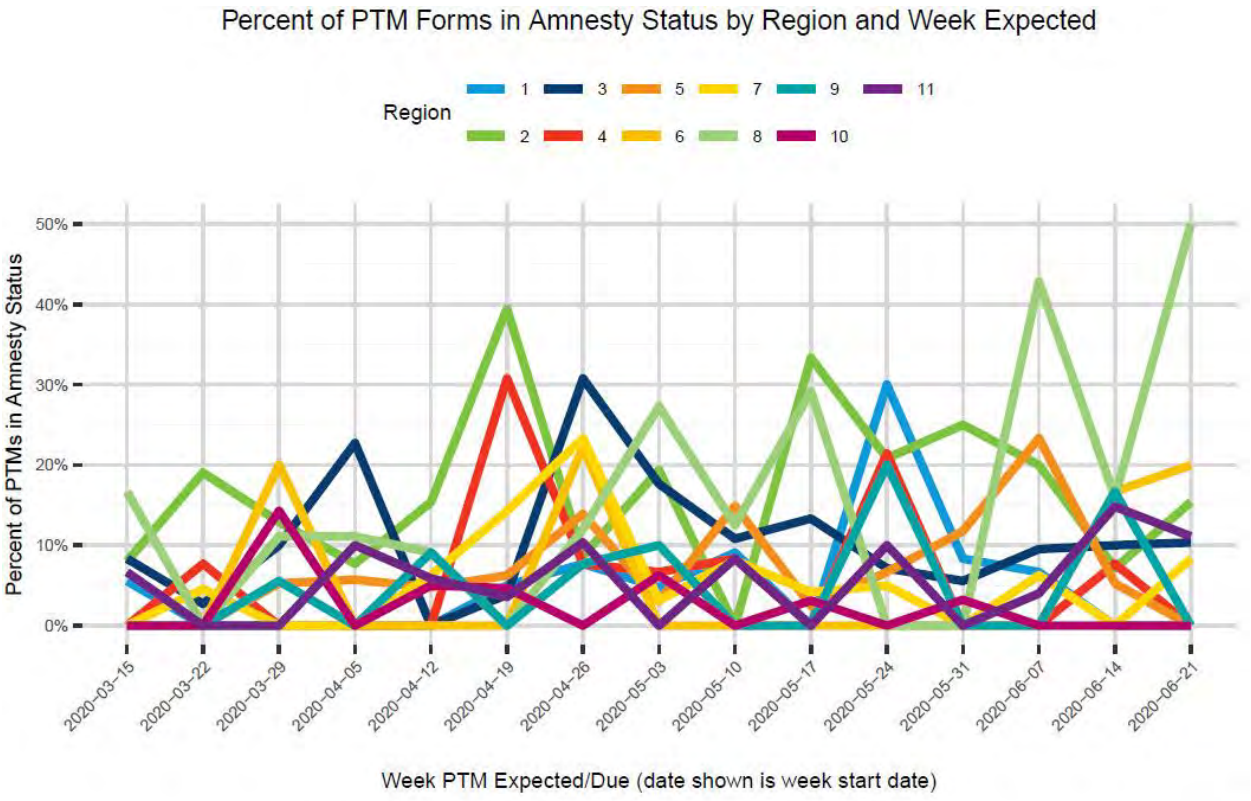
The following set of graphics show the number and percent of post-transplant malignancy (PTM) forms in amnesty status by week, OPTN region, and organ. These forms only generate from an indication of malignancy on the TRF, and the percent of PTM forms in amnesty status has increased slightly during COVID-19.





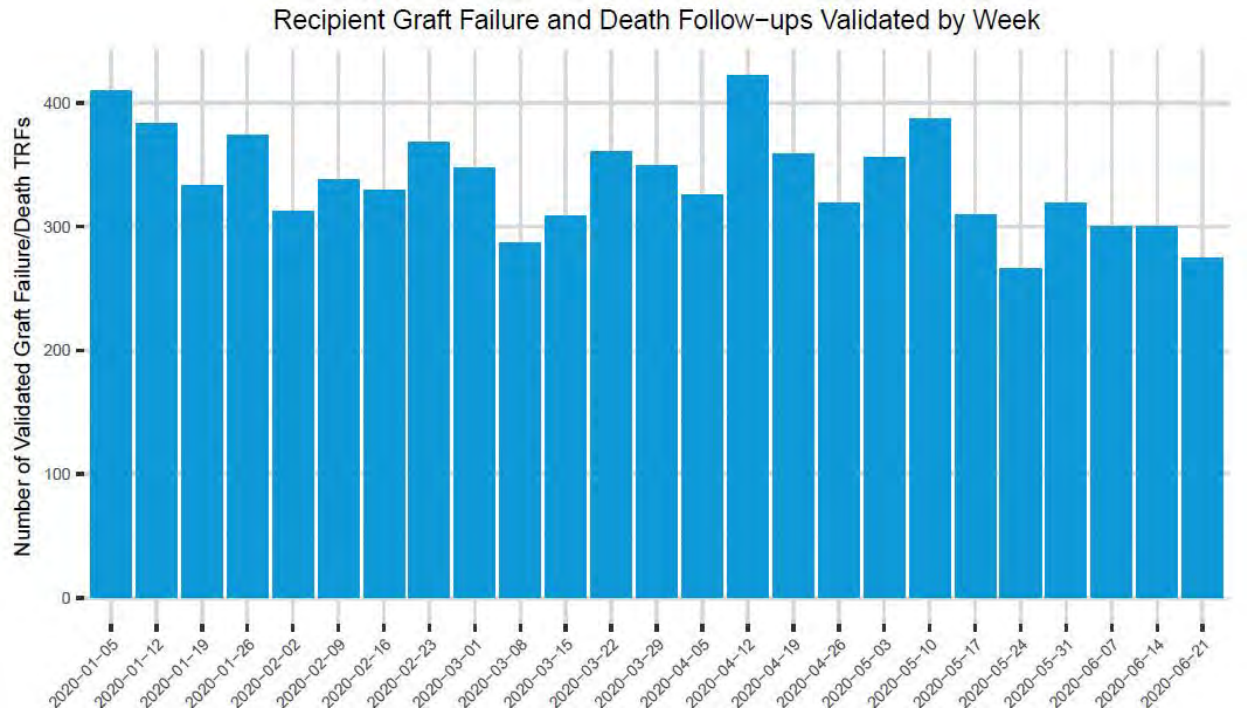
Weeks run Sunday–Saturday.

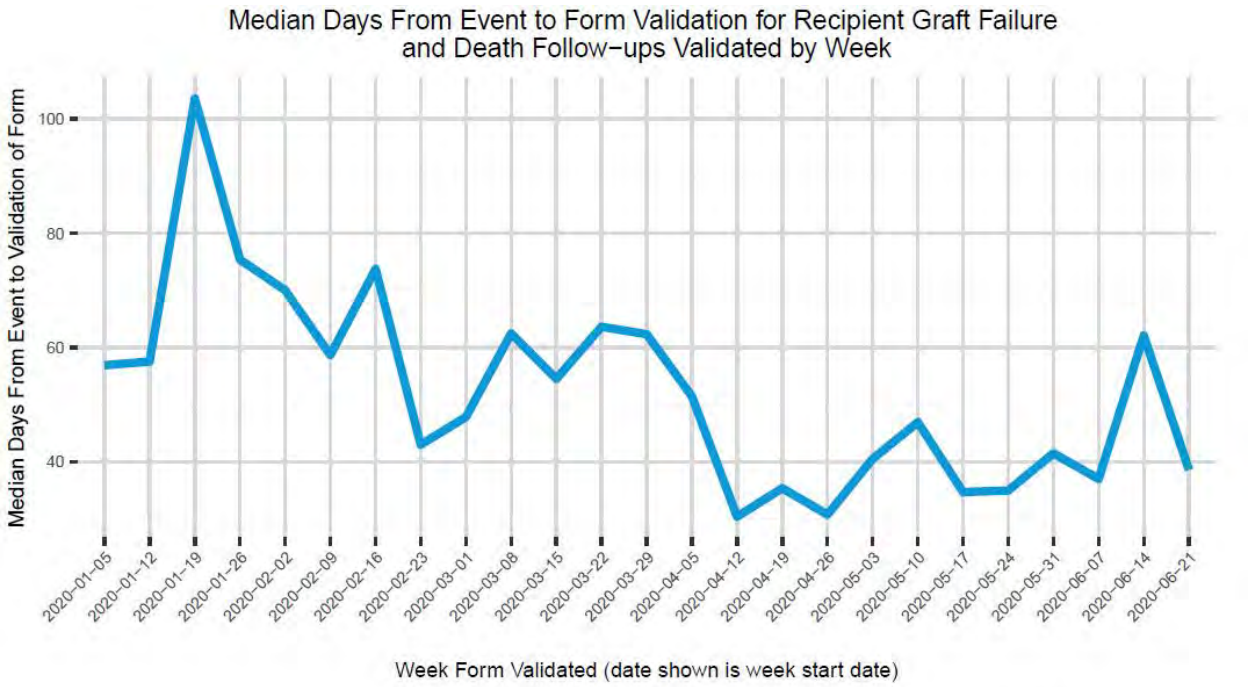




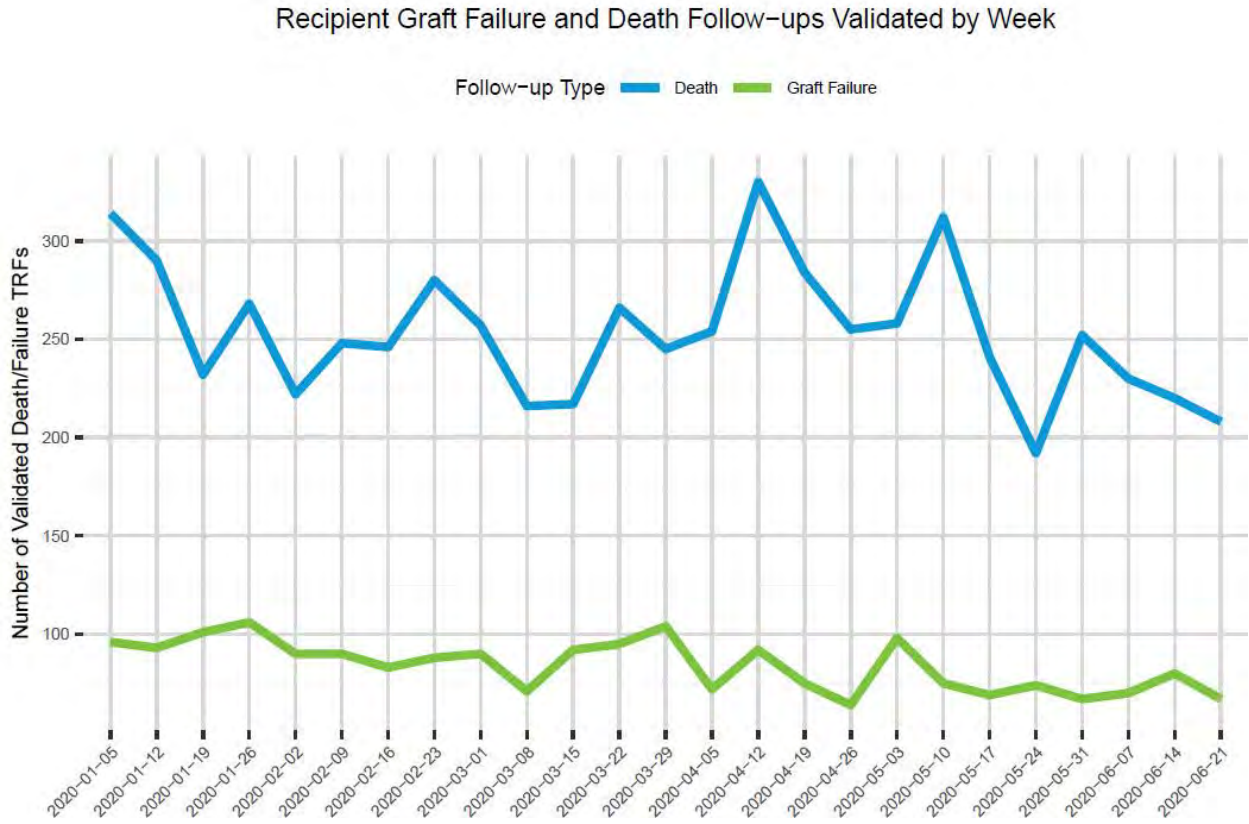
Weeks run Sunday–Saturday.

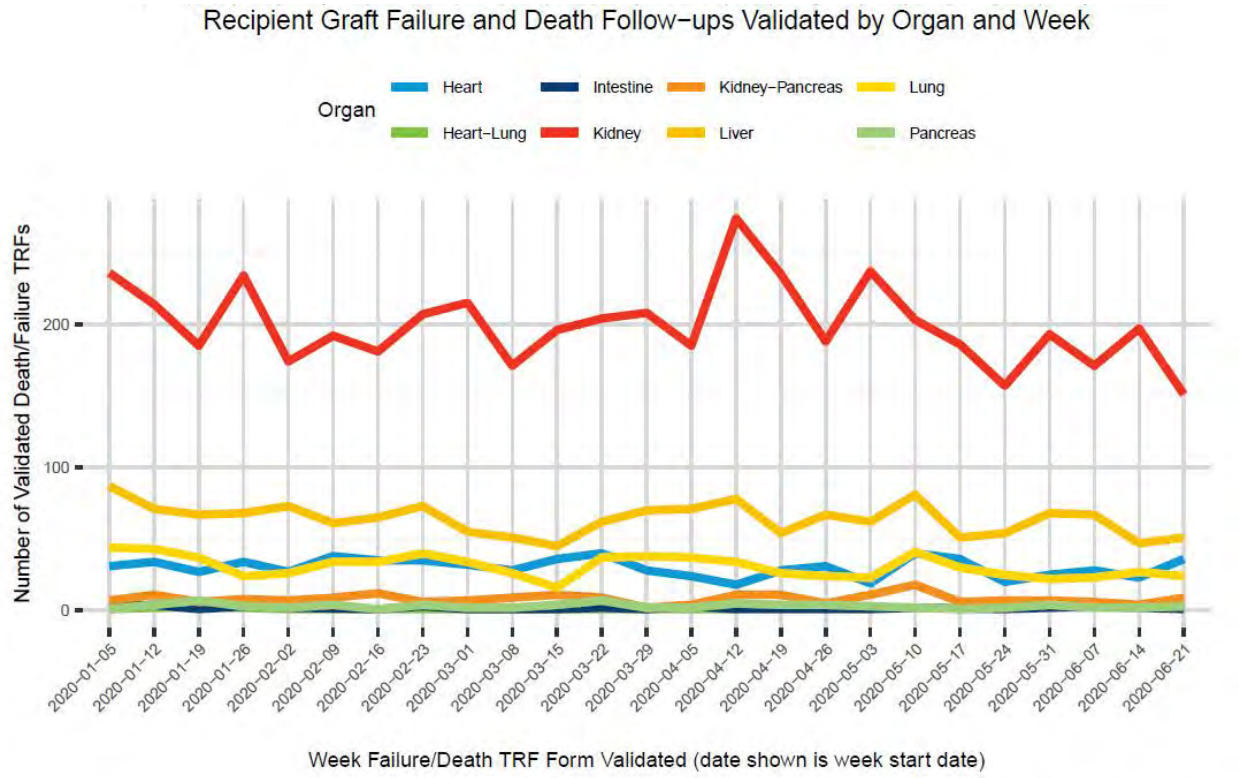
The following set of graphics show the number of graft failure and patient deaths reported on TRF forms by week, OPTN region, and organ. Emergency policy requires these events still be reported, but extended the timeframe from 14 to 30 days. The number of forms indicating these events has remained stable week over week. Recently, there appears to be a decrease in reporting time, which may be indicative of increased communication with patients during COVID-19.



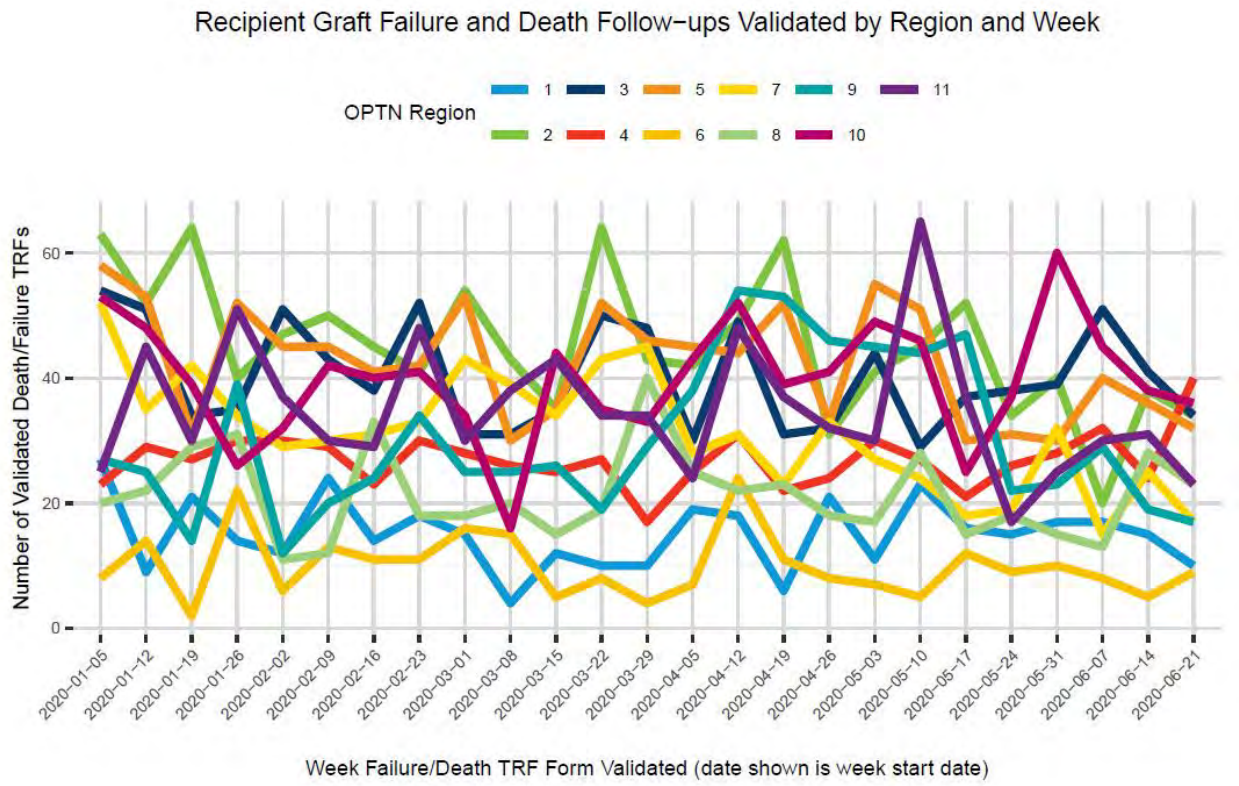


Weeks run Sunday−Saturday.





Weeks run Sunday-Saturday.



Summary and Conclusions

The number and percent of candidates that appear to be taking advantage of carrying labs forward to maintain their waiting list status is small across all organs. Data shown should be the maximum usage; one limitation of the analysis is that there is no way to distinguish in the OPTN database if candidates updated their labs and happened to have the same values from their last labs.

The number of waiting list additions has decreased during COVID-19 (both for dialysis and non-dialysis kidney candidates), but the percentage non-dialysis candidates qualifying for waiting time by eGFR/CrCl has remained fairly stable. As we move further into 2020, it will become known if these candidates will be listed at a later date and use a waiting time modification form to request waiting time back to the date of their qualifying eGFR/CrCl.

The number and percent of TRF, LDF, and PTM forms in 'Amnesty' status have grown throughout the most recent months. For the most part, forms in amnesty status does not appear to be limited to a single organ or OPTN region. This will have analytic implications if transplant programs do not enter the data retrospectively, which is not required by OPTN policy. The number of graft failure and patient death forms have remained stable, and programs are even reporting events faster than previously. This may be due to an increase in provider-patient communications.

Appendix B: Donor Testing for COVID-19

On April 21, 2020, new optional data elements were added to DonorNet® to collect information on testing for COVID-19 in deceased donors. In addition to details on the types of tests, specimens used, and the results, this new data collection includes an initial question to determine the percentage of donors being tested for COVID-19:

- **Was COVID-19 (SARS-CoV-2) testing performed on the donor? (Yes/No/Unknown)**

An analysis of responses provided within the data field as well as an NLP (Natural Language Processing) analysis was completed by the UNOS Data Science team and the results are provided in the table below.

Resu

The below table lists where COVID-19 testing information was provided for donors by week, starting on April 21, 2020.

		Results Reported In DonorNet . . .			
Week of	N Recovered Donors	Field	Text	Attachments	Any
Total	**2297**	**1651 (71.9%)**	**1518 (66.1%)**	**2220 (96.6%)**	**2296 (100.0%)**
Apr 21 2020	209	130 (62.2%)	155 (74.2%)	205 (98.1%)	209 (100.0%)
Apr 28 2020	210	163 (77.6%)	161 (76.7%)	203 (96.7%)	210 (100.0%)
May 05 2020	201	148 (73.6%)	136 (67.7%)	195 (97.0%)	201 (100.0%)
May 12 2020	245	180 (73.5%)	151 (61.6%)	237 (96.7%)	245 (100.0%)
May 19 2020	230	154 (67.0%)	157 (68.3%)	223 (97.0%)	230 (100.0%)
May 26 2020	244	173 (70.9%)	149 (61.1%)	237 (97.1%)	244 (100.0%)
Jun 02 2020	255	194 (76.1%)	159 (62.4%)	246 (96.5%)	255 (100.0%)
Jun 09 2020	234	162 (69.2%)	151 (64.5%)	224 (95.7%)	234 (100.0%)
Jun 16 2020	251	189 (75.3%)	163 (64.9%)	245 (97.6%)	251 (100.0%)
Jun 23 2020	216	156 (72.2%)	135 (62.5%)	203 (94.0%)	215 (99.5%)
Jun 30 2020	2	2 (100.0%)	1 (50.0%)	2 (100.0%)	2 (100.0%)

As of June 30th, there were 2,297 deceased donors reported recovered by U.S. OPOs from April 21-June 30, 2020. Of those 2,297 donors, 71.9% (1651) utilized the new data element for capturing COVID-19 testing results, 66.1% (1518) indicated testing was performed in the one of the large text "highlights" fields in DonorNet®, and 96.6% (2220) attached the COVID-19 testing results as a separate document. UNOS Research reached out to the OPO who had not reported testing for COVID-19 in DonorNet for the week of June 23, 2020, and determined that the donor was tested. **This analysis determined that all deceased donors recovered during this period were tested for COVID-19.**

The table below shows the test results reported in the new DonorNet® data field for donors being tested for COVID-19. The donor below showing a positive COVID-19 result in this report was not an active infection. A UNOS Patient Safety Coordinator spoke with the OPO who confirmed it was a pediatric donor who had a negative COVID-19 PCR result, but did test positive for the antibody. The OPO reports they feel the donor's antibodies resulted from the birth mother who had COVID-19 during pregnancy. All centers knew of these results prior to donation.

Week Donor Recovered	Testing Result				
	Indeterminate	Negative	Positive	Pending	Not Reported
2020-04-19	0	114 (99.13%)	0	1 (0.87%)	0
2020-04-26	0	214 (98.17%)	0	4 (1.83%)	0
2020-05-03	1 (0.47%)	210 (98.13%)	0	3 (1.4%)	0
2020-05-10	1 (0.43%)	229 (97.86%)	0	4 (1.71%)	0
2020-05-17	1 (0.4%)	240 (95.62%)	0	10 (3.98%)	0
2020-05-24	0	256 (96.6%)	0	9 (3.4%)	0
2020-05-31	0	263 (94.27%)	1 (0.36%)	15 (5.38%)	0
2020-06-07	2 (0.77%)	245 (94.23%)	0	12 (4.62%)	1 (0.38%)
2020-06-14	0	293 (95.44%)	0	14 (4.56%)	0
2020-06-21	0	269 (97.11%)	0	8 (2.89%)	0
2020-06-28	0	47 (95.92%)	0	2 (4.08%)	0

Note:
Each donor may have multiple tests done

Policy and/or Bylaws Language

Proposed new language is underlined (example) and language that is proposed for removal is struck through (~~example~~). Heading numbers, table and figure captions, and cross-references affected by the numbering of these policies will be updated as necessary.

Policy 1.4.F: Updates to Candidate Data during 2020 COVID-19 Emergency

This emergency policy is in effect due to the public health emergency declared by the President of the United States on March 13, 2020. This emergency policy only applies to transplant programs that have candidates who require clinical data updates per OPTN policy in order to maintain prioritization or eligibility.

During the 2020 COVID-19 emergency:

1. Transplant programs should continue to make all reasonable efforts to collect and report clinical data as required by OPTN Policy.
2. Any transplant program that is required by OPTN Policy to report clinical data in order to maintain a candidate's prioritization or eligibility, and: a) is prevented from collecting such data due to the COVID-19 emergency, or: b) in their medical judgment chooses not to collect such data due to the COVID-19 emergency, may use the candidate's clinical data values that were most recently reported to the OPTN. When reporting previous clinical data pursuant to this emergency policy, the transplant program must report the date the program is entering the data as the collection date.
3. While using this policy, transplant programs must document in the candidate's medical record the circumstances that support use of this emergency policy.

18.1 Data Submission Requirements

Members must report accurate data to the OPTN using standardized forms according to *Table 18-1* below. Members are responsible for providing documentation upon request to verify the accuracy of all data that is submitted to the OPTN through the use of standardized forms.

Table 18-1: Data Submission Requirements

The following member:	Must submit the following materials to the OPTN:	Within:	For:
Histocompatibility Laboratory	*Donor histocompatibility* (DHS)	30 days after the OPO submits the deceased donor registration	Each heart, intestine, kidney, liver, lung, or pancreas donor typed by the laboratory

The following member:	Must submit the following materials to the OPTN:	Within:	For:
Histocompatibility Laboratory	*Recipient histocompatibility* (RHS)	*Either* of the following: • 30 days after the transplant hospital removes the candidate from the waiting list because of transplant • 30 days after the transplant hospital submits the *recipient feedback*	Each heart, intestine, kidney, liver, lung, or pancreas transplant recipient typed by the laboratory
OPOs, all	*Death notification records* (DNR)	30 days after the end of the month in which a donor hospital reports a death to the OPO or the OPO identifies the death through a death record review	All imminent neurological deaths and eligible deaths in its DSA
OPOs, all	*Monthly Donation Data Report: Reported Deaths*	30 days after the end of the month in which a donor hospital reports a death to the OPO	All deaths reported by a hospital to the OPO
Allocating OPO	*Potential transplant recipient* (PTR)	30 days after the match run date by the OPO or the OPTN	Each deceased donor heart, intestine, kidney, liver, lung, or pancreas that is offered to a potential recipient
Allocating OPO	*VCA Candidate List*	30 days after the procurement date	Each deceased donor VCA organ that is offered to a potential VCA recipient
Host OPO	*Donor organ disposition (feedback)*	5 business days after the procurement date	Individuals, except living donors, from whom at least one organ is recovered

The following member:	Must submit the following materials to the OPTN:	Within:	For:
Host OPO	*Deceased donor registration* (DDR)	30 days after the *donor organ disposition (feedback)* form is submitted and disposition is reported for all organs	All deceased donors
Recovery Hospitals	*Living donor feedback*	The time prior to donation surgery	Each potential living donor organ recovered at the hospital This does not apply to VCA donor organs
Recovery Hospitals	*Living donor feedback* Members must amend the form or contact the OPTN Contractor to amend this form according to *Policy 18.6: Reporting of Living Donor Adverse Events*	72 hours after the donor organ recovery procedure	Any potential living donor who received anesthesia but did not donate an organ or whose organ is recovered but not transplanted into any recipient
Recovery Hospitals	*Living donor registration* (LDR)	60 days after the recovery hospital submits the *living donor feedback* form	Each living donor organ recovered at the hospital This does not apply to VCA donor organs

The following member:	Must submit the following materials to the OPTN:	Within:	For:
Recovery Hospitals	*Living donor follow-up* (LDF)	Either: • 60 days before or after the six-month, 1-year, and 2-year anniversary of the donation date or • As determined possible by the transplant hospital during the COVID-19 emergency.	Each living donor organ recovered at the hospital This does not apply to VCA, domino donor, and non-domino therapeutic donor organs. Non-submission of the full LDF is acceptable during the COVID-19 emergency.
Transplant hospitals	*Organ specific transplant recipient follow-up* (TRF)	Either of the following: • 30 days after the six-month and annual anniversary of the transplant date until the recipient's death or graft failure or as determined possible by the transplant hospital during the COVID-19 emergency. • ~~14~~30 days from notification of the recipient's death or graft failure	Each recipient followed by the hospital Non-submission of the full TRF is acceptable during the COVID-19 emergency; however notifications of recipient's death or graft failure are still required during the COVID-19 emergency.
Transplant hospitals	*Organ specific transplant recipient registration* (TRR)	60 days after transplant hospital removes the recipient from the waiting list	Each recipient transplanted by the hospital
Transplant hospitals	*Liver Post-Transplant Explant Pathology*	60 days after transplant hospital submits the *recipient feedback* form	Each liver recipient transplanted by the hospital

The following member:	Must submit the following materials to the OPTN:	Within:	For:
Transplant hospitals	*Recipient feedback*	1 day after the transplant	Each heart, intestine, kidney, liver, lung, or pancreas recipient transplanted by the hospital
Transplant hospitals	*Candidate Removal Worksheet*	1 day after the transplant	Each VCA recipient transplanted by the hospital
Transplant hospitals	*Recipient malignancy* (PTM)	Either: • 30 days after the transplant hospital reports the malignancy on the *transplant recipient follow-up* form or • As determined possible by the transplant hospital during the COVID-19 emergency.	Each heart, intestine, kidney, liver, lung, or pancreas recipient with a reported malignancy that is followed by the hospital. Non-submission is acceptable during the COVID-19 emergency.
Transplant hospitals	*Transplant candidate registration* (TCR)	30 days after the transplant hospital registers the candidate on the waiting list	Each heart, intestine, kidney, liver, lung, or pancreas candidate on the waiting list or recipient transplanted by the hospital

18.2 Timely Collection of Data

Members must collect and submit timely information to the OPTN Contractor. Timely data on recipients and living donors is based on recipient or living donor status at a time as close as possible to the specified transplant event anniversary. **Error! Reference source not found.** sets standards for when the member must collect the data from the patient.

Table 18-2: Timely Data Collection

Information is timely if this Member:	Collects this information for this form:	Within this time period:
Transplant hospital	*Organ specific transplant recipient registration* (TRR)	When the transplant recipient is discharged from the hospital or 42 days following the transplant date, whichever is first.

Information is timely if this Member:	Collects this information for this form:	Within this time period:
Recovery hospital	*Living donor registration* (LDR)	When the living donor is discharged from the hospital or 42 days following the transplant date, whichever is first. This does not apply to VCA transplants.
Recovery hospital	*Living donor follow-up* (LDF)	Either: • 60 days before or after the six-month, 1-year, and 2-year anniversary of the donation date or • As determined possible by the transplant hospital during the COVID-19 emergency. This does not apply to VCA transplants. Non-submission is acceptable during the COVID-19 emergency.

18.5 Living Donor Data Submission Requirements

The follow up period for living donors will be a minimum of two years.

The OPTN Contractor will calculate follow-up rates separately, and at least annually, for the submission of the six-month, one-year, and two-year LDF forms.

Living donor follow-up reporting requirements do not apply to any transplant recipient whose replaced or explanted organ is donated to another candidate.

18.5.A Reporting Requirements after Living Kidney Donation

During the COVID-19 emergency, these policy requirements are suspended.

The recovery hospital must report accurate, complete, and timely follow up data for donor status and clinical information using the LDF form for at least:

- 60% of their living kidney donors who donate between February 1, 2013 and December 31, 2013
- 70% of their living kidney donors who donate between January 1, 2014 and December 31,

2014
- 80% of their living kidney donors who donate after December 31, 2014

The recovery hospital must report accurate, complete, and timely follow up kidney laboratory data using the LDF form for at least:

- 50% of their living kidney donors who donate between February 1, 2013 and December 31, 2013
- 60% of their living kidney donors who donate between January 1, 2014 and December 31, 2014
- 70% of their living kidney donors who donate after December 31, 2014

Required kidney donor status and clinical information includes *all* of the following:

1. Patient status
2. Working for income, and if not working, reason for not working
3. Loss of medical (health, life) insurance due to donation
4. Has the donor been readmitted since last LDR or LDF form was submitted?
5. Kidney complications
6. Regularly administered dialysis as an ESRD patient
7. Donor developed hypertension requiring medication
8. Diabetes
9. Cause of death, if applicable and known

Required kidney laboratory data includes *all* of the following:

1. Serum creatinine
2. Urine protein

18.5.B Reporting Requirements after Living Liver Donation

During the COVID-19 emergency, these policy requirements are suspended.

The recovery hospital must report accurate, complete, and timely follow-up data using the LDF form for living liver donors who donate after September 1, 2014, as follows:

1. Donor status and clinical information for 80% of their living liver donors.
2. Liver laboratory data for at least:
   - 75% of their living liver donors on the 6 month LDF
   - 70% of their living liver donors on the one year LDF

Required liver donor status and clinical information includes *all* of the following:

1. Patient status
2. Cause of death, if applicable and known
3. Working for income, and if not working, reason for not working
4. Loss of medical (health, life) insurance due to donation
5. Hospital readmission since last LDR or LDF was submitted

6. Liver complications, including the specific complications
    - Abscess
    - Bile leak
    - Hepatic resection
    - Incisional hernias due to donation surgery
    - Liver failure
    - Registered on the liver candidate waiting list

Required liver laboratory data includes *all* of the following:

1. Alanine aminotransferase
2. Alkaline phosphatase
3. Platelet count
4. Total bilirubin

3.7.D Applications for Modifications of Kidney Waiting Time during 2020 COVID-19 Emergency

This emergency policy only applies to candidates whose ability to demonstrate eligibility for kidney waiting time has been compromised by the COVID-19 public health emergency declared by the President of the United States on March 13, 2020.

This emergency policy allows transplant programs to submit a waiting time modification for candidates who were not on regularly administered dialysis and, due to the emergency, were unable to begin accruing waiting time according *Policy 8.4.A Waiting Time for Candidates Registered at Age 18 Years or Older* or *Policy 8.4.B Waiting Time for Candidates Registered prior to Age 18.*

To apply for a waiting time modification, the candidate's transplant program must submit an application to the OPTN with *all* of the following information:

1. The requested waiting time start date for the candidate. The requested start date must be the date when the transplant program made the decision to register the candidate.
2. Documentation explaining why the circumstances of the COVID-19 public health emergency prevented the candidate from beginning to accrue waiting time according to *Policy 8.4.A Waiting Time for Candidates Registered at Age 18 Years or Older* or *Policy 8.4.B Waiting Time for Candidates Registered prior to Age 18.* For candidates registered at age 18 years or older, documentation must include a date prior to the requested start date that the candidate's measured or calculated creatinine clearance or GFR was less than or equal to 20 mL/min.
3. The name and signature of the candidate's physician or surgeon.

Upon receipt of a complete application the OPTN will implement the waiting time modification for candidates who were impacted by the COVID-19 emergency.
This subsection supersedes any conflicting requirements in other sections of OPTN Policy for candidates that apply for a waiting time modification pursuant to this subsection.

ADD: parent question field: “Was COVID-19 (SARS-CoV-2) testing performed on the donor?”

a. Yes/No/Unknown field to allow OPOs to clearly indicate testing status related to COVID-19 (SARS-CoV-2)
    i. If yes:
        1. *ADD* specimen date field
        2. *ADD* time field
        3. *ADD* specimen type field
        4. *ADD* hemodiluted specimen field
        5. *ADD* test method field
        6. *ADD* results field
        7. *ADD* “comments” field - free text box for entry for information relevant to COVID-19 testing (e.g. “results pending”)
    ii. If no: no child data fields will display

OPTN

Public Comment Proposal

Incorporating COVID-19 Related Organ Failure In Candidate Listings

OPTN Lung Transplantation Committee

Prepared by: Elizabeth Miller
UNOS Policy and Community Relations Department

Contents

Incorporating COVID-19 Related Organ Failure In Candidate Listings

Affected Policies: *10.1.F.i Lung Disease Diagnosis Groups*
Sponsoring Committee: *Lung Transplantation*
Public Comment Period: *August 31, 2020 – October 1, 2020*

Executive Summary

Lung transplantation has emerged as a treatment option for some patients with severe lung damage resulting from COVID-19. The OPTN does not have a method for identifying candidate listings for COVID-19 related organ failure. Although at least three such patients are known to have been transplanted in the United States, it is currently unknown whether other candidates have been listed or transplanted as a result of lung disease caused by COVID-19.

This proposed change would establish standard diagnoses for listing lung candidates due to damage caused by COVID-19. This will allow identification of trends in listing candidates for COVID-19, and potentially even more accurate inclusion in future updates to the Lung Allocation Score (LAS) calculation.

Reports of injury to other organs from COVID-19 have emerged as well, including heart, kidney and liver.[1] The OPTN Lung Transplantation Committee (Lung Committee) is seeking feedback on whether there are other diagnoses caused by COVID-19 infection that would lead to listing a patient for lung transplant, whether candidates for other organ transplants are being listed due to COVID-19 related organ failure, and whether the OPTN should establish COVID-19 related diagnosis codes for other organs.

[1] Qingxing Chen, Lili Xu, Yongbin Dai, Yunlong Ling, Jiahao Mao, Juying Qian, Wenqing Zhu, Wencheng Di, Junbo Ge, "Cardiovascular manifestations in severe and critical patients with COVID -19." *Clinical Cardiology*, 20 June 2020.

Background

The World Health Organization has labeled COVID-19 as a pandemic[2], and the death toll has exceeded 154,000 in the United States alone.[3] In some candidates with severe cases of COVID-19, lasting damage to the lungs is being treated with lung transplantation. Three such transplants have been reported in the United States,[4] while at least six COVID-19 related lung transplant cases have been reported in China and one has been reported in Austria.[5]

Northwestern Medical Center performed two double lung transplants on patients whose lungs were damaged by COVID-19.[6] The University of Florida Health also performed a double lung transplant for a patient due to COVID-19.[7] According to news sources, other patients have been evaluated for lung transplant at Keck Hospital of the University of Southern California,[8] and other transplant centers have anecdotally reported evaluating similar candidates for listing for lung transplant.

There have not been similar reports of other organs transplanted to address organ failure from COVID-19, but there is emerging evidence that COVID-19 can cause lasting damage to other organs. In light of developing evidence that COVID-19 causes heart[9] and kidney[10] damage, there are concerns that it may lead to irreversible damage as there are more cases and more time lapses.[11] There is also evidence that liver damage is common in COVID-19 patients, although it is unclear whether COVID-19 is the direct cause.[12]

Purpose

This proposed change will allow lung candidates listed as a result of COVID-19 related disease to be identified to support future calculation of appropriate lung allocation scores (LAS), which is one factor used to sort candidates on the match. It will also permit the OPTN to analyze patterns in candidates

[2] World Health Organization, *WHO Director-General's opening remarks at the media briefing on COVID-19 - 11 March 2020*, March 11, 2020, https://www.who.int/dg/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing-on-covid-19---11-march-2020.
[3] Centers for Disease Control and Prevention, *Daily Updates of Totals by Week and State*, August 18, 2020, https://www.cdc.gov/nchs/nvss/vsrr/covid19/index.htm.
[4] D. Hagmajer, *UF Health surgeons perform historic double-lung transplant on COVID-19 survivor*, July 30, 2020. https://ufhealth.org/news/2020/uf-health-surgeons-perform-historic-double-lung-transplant-covid-19-survivor.
[5] Crystal Phend, Transplant for COVID-Ravaged Lungs: Caution Ahead, Medpage Today, June 17, 2020, https://www.medpagetoday.com/infectiousdisease/covid19/87136.
[6] Northwestern Memorial Hospital, *Meet the Two COVID-19 Patients Who Received Double-Lung Transplants at Northwestern Medicine*, July 30, 2020. https://www.nm.org/about-us/northwestern-medicine-newsroom/press-releases/2020/meet-the-two-covid19-double-lung-transplant-patients.
[7] D. Hagmajer, *UF Health surgeons perform historic double-lung transplant on COVID-19 survivor*, July 3o, 2020. https://ufhealth.org/news/2020/uf-health-surgeons-perform-historic-double-lung-transplant-covid-19-survivor.
[8] Veronica Miracle. "Palm Springs nurse in need of lung transplant after monthslong battle with COVID-19." *ABC 7 News*, August 9, 2020, https://abc7news.com/nurse-covid-lung-transplant-palm-springs-patient-providence-saint-johns-health-center/6362814/; Sharon Song, "COVID-19 leaves college student and teen brother only survivors in household." *WIFR*, July 30, 2020, https://www.wifr.com/2020/07/30/covid-19-leaves-college-student-and-teen-brother-only-survivors-in-household/.
[9] Yancy CW, Fonarow GC. "Coronavirus Disease 2019 (COVID-19) and the Heart—Is Heart Failure the Next Chapter?" *JAMA Cardiol*. Published online July 27, 2020. doi:10.1001/jamacardio.2020.3575.
[10] Jain Wu, Shu Song, Hong-Cui Cao and Lan-Juan Li, Liver diseases in COVID-19: Etiology, treatment and prognosis. *World journal of gastroenterology*, *26*(19), 2286–2293.
[11] Yancy CW, Fonarow GC. "Coronavirus Disease 2019 (COVID-19) and the Heart—Is Heart Failure the Next Chapter?" *JAMA Cardiol*. Published online July 27, 2020. doi:10.1001/jamacardio.2020.3575.
[12] Jain Wu, Shu Song, Hong-Cui Cao and Lan-Juan Li, Liver diseases in COVID-19: Etiology, treatment and prognosis. *World journal of gastroenterology*, *26*(19), 2286–2293.

listed because of organ damage from COVID-19. The ability to analyze data on this specific candidate population will allow the transplant system to more quickly identify trends and adapt as needed.

The Lung Committee submits the following proposal under the authority of the OPTN Final Rule, which states "The OPTN Board of Directors shall be responsible for developing…policies for the equitable allocation for cadaveric organs."[13] Furthermore, "An organ procurement organization or transplant hospital shall, as specified from time to time by the Secretary, submit to the OPTN…information regarding transplant candidates, transplant recipients, [and] donors of organs…."[14] The OPTN shall "maintain records of all transplant candidates, all organ donors and all transplant recipients"[15] and shall "…receive…such records and information electronically…"[16]

Overview of Proposal

The Lung Committee proposes adding two new options to the diagnosis drop down menu in UNet℠ for lung candidates. The proposed diagnoses are "COVID-19: acute respiratory distress syndrome (ARDS)" and "COVID-19: pulmonary fibrosis," and would be added to LAS Group D in lung allocation policy. Capturing the information discretely for COVID-19 related ARDS and pulmonary fibrosis will allow the OPTN to evaluate the impact COVID-19 is having on lung transplant, and establish a data set for long term study of whether outcomes and mortality for COVID-related disease is different than non-COVID related disease.

The Lung Committee recognizes the value in collecting information consistently across organs, and is therefore also considering suggesting similar new options for the diagnosis fields for the other organs. Lung Committee leadership has consulted with other OPTN committees; the Lung Committee agreed adding an inquiry about diagnosis codes for other organs would be an appropriate addition to this lung proposal.

The Lung Committee would like feedback on:

- For lung, are there diagnoses other than ARDS and pulmonary fibrosis that would be caused by COVID-19 and require lung transplantation?
- Are candidates for other organs being listed due to COVID-19 related organ failure?
- Should the OPTN establish COVID-19 related diagnosis codes for other organs?

Lung

COVID-19 is primarily a respiratory illness. "The most frequent, serious manifestation of COVID-19 infection seems to be pneumonia… Although most patients will only experience mild symptoms of the disease, some patients will experience rapid progression of their symptoms… One study found that 17% of their patients developed Acute Respiratory Distress Syndrome (ARDS) and among these, 65% rapidly worsened and died from multiple organ failure."[17] There have been at least three double lung

[13] 42 CFR §121.8(a).
[14] 42 CFR §121.11(b)(2).
[15] 42 CFR §121.11(a)(1)(ii).
[16] 42 CFR §121.11(a)(1)(iii).
[17] Zaim, S., Chong, J. H., Sankaranarayanan, V., & Harky, A. (2020). COVID-19 and Multiorgan Response. *Current problems in cardiology*, *45*(8), 100618. https://doi.org/10.1016/j.cpcardiol.2020.100618

transplants, and more candidates placed on the waitlist as a result of ARDS or pneumonia from COVID-19.[18] The Lung Committee proposes including COVID-19 diagnosis options for lung candidates.

Heart

Cardiac injury is a relatively common complication in severely ill COVID-19 patients.[19] In an analysis from Wuhan, China, 23% of critically ill COVID-19 patients had cardiac injury. It is not possible to say with certainty whether any candidates have been listed or transplanted with a heart as a result of COVID-19, because no heart candidate listings have been publically reported and that information is not collected by the OPTN. Leaders from the Heart Transplantation Committee have stated that they expect heart candidates to be listed soon based on the type of heart damage they are observing in their medical practice. The Lung Committee is seeking feedback on whether COVID-19 diagnoses should be collected on heart candidates.

Kidney

COVID-19 causes acute kidney injury (AKI) in many severe cases of COVID-19, especially those where hospitalization is required.[20] In one analysis, about half of the patients admitted to the hospital as a result of COVID-19 had reached Kidney Disease Improving Global Outcomes (KDIGO) stage 1 AKI, and 14.3% of those required dialysis.[21] Of those that required dialysis, most required invasive mechanical ventilation, and the timing of the intubation and the diagnosis of AKI are highly correlated.

There have not been any reported kidney transplants to treat damage from COVID-19. This may be because of the high risk of death, and other complicating factors such as ventilator dependence once a patient needs renal replacement in the progression of COVID-19. Without collecting this specific information regarding the kidney diagnosis in UNet, it is difficult to be certain that no candidates have been listed as a result of COVID-19. The Kidney Transplantation Committee supports collecting similar diagnosis information when kidney candidates are registered. The Lung Committee is seeking additional feedback on whether COVID-19 diagnoses should be collected on kidney candidates.

Liver and Intestine

Early data appear to indicate that COVID-19 can affect the gastrointestinal tract and liver.[22] Liver damage has been reported in COVID-19 patients, proportionate to the severity of COVID-19. In the Wuhan study, 29% of severely ill COVID-19 patients had liver damage.[23]

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[18] Denise Grady, "A Covid Patient Goes Home After a Rare Double Lung Transplant", *The New York Times,* July 30, 2020. https://www.nytimes.com/2020/07/30/health/Covid-lung-transplant.html

[19] Dariya, B., & Nagaraju, G. P. (2020). Understanding novel COVID-19: Its impact on organ failure and risk assessment for diabetic and cancer patients. *Cytokine & growth factor reviews*, *53*, 43–52. https://doi.org/10.1016/j.cytogfr.2020.05.001

[20] Daniel Batlle, Maria Jose Soler, Matthew A. Sparks, Swapnil Hiremath, Andrew M. South, Paul A. Welling, Sundararaman. "Acute Kidney Injury in COVID-19: Emerging Evidence of a Distinct Pathophysiology." *JASN* Jul 2020, 31 (7) 1380-1383; DOI: 10.1681/ASN.2020040419

[21] Jamie S. Hirsch, Jia H. Ng, Daniel W. Ross, Purva Sharma, Hitesh H. Shah, Richard L. Barnett1 , Azzour D. Hazzan1 , Steven Fishbane and Kenar D. Jhaveri. "Acute kidney injury in patients hospitalized with COVID-19" *Kidney International* (2020) 98, 209–218.

[22] Yang, Lijing et al.. "Implications of gastrointestinal manifestations of COVID-19." https://www.thelancet.com/journals/langas/article/PIIS2468-1253(20)30132-1/fulltext. *The Lancet Gastroenterology & Hepatology*, Volume 5, Issue 7, 629 - 630

[23] Zaim, S., Chong, J. H., Sankaranarayanan, V., & Harky, A. (2020). COVID-19 and Multiorgan Response. *Current problems in cardiology*, *45*(8), 100618. https://doi.org/10.1016/j.cpcardiol.2020.100618

There have not been reports of candidates being listed for liver or intestine transplant as a result of COVID-19. The Lung Committee received feedback from Liver and Intestine Transplantation Committee leaders that COVID-19 infections were not likely to lead to a need for liver or intestine transplant. The Lung Committee is seeking additional feedback on whether COVID-19 patients could need a liver or intestine transplant as a result of damage from COVID-19.

Pancreas and Vascularized Composite Allograft (VCA)

It is currently unclear whether there is a connection between acute pancreatitis and COVID-19, and there is not currently evidence of any connection between COVID-19 and damage that would require a VCA transplant.[24] The Pancreas Transplantation Committee did not expect any pancreas candidates to be listed as a result of COVID-19. The Lung Committee is seeking feedback on whether COVID-19 diagnoses should be collected on pancreas or VCA candidates.

Diagnosis in Allocation

The Lung Committee proposes including both "COVID-19: acute respiratory distress syndrome" and "COVID-19: pulmonary fibrosis" in Diagnosis Group D (restrictive lung disease), outlined in *OPTN Policy 10.1.F.i Lung Disease Diagnosis Groups*. This is the Diagnosis Group in which ARDS and pulmonary fibrosis from non-COVID-19 causes are included.

The diagnosis group (A-D) that a candidate's diagnosis falls within directly impacts their LAS. These points are calculated based on the predicted likelihood of waiting list survival and post-transplant survival.[25] The diagnoses currently included in group D are restrictive lung disease diagnoses,[26] including "acute respiratory distress syndrome (ARDS)/pneumonia", which is consistent with the known progression of COVID-19,[27] and pulmonary fibrosis diagnoses which can develop from ARDS.[28]

Figure 1: Progression of COVID-19[29]

[24] Thaweerat W. (2020). Current evidence on pancreatic involvement in SARS-CoV-2 infection. *Pancreatology : official journal of the International Association of Pancreatology (IAP) ... [et al.]*, *20*(5), 1013–1014. https://doi.org/10.1016/j.pan.2020.05.015

[25] The calculation of LAS is the subject of a related proposal currently published for public comment, the proposal for an *Updated Cohort for Calculation of the Lung Allocation Score (LAS)*, available at https://optn.transplant.hrsa.gov/governance/public-comment/updated-cohort-for-calculation-of-the-lung-allocation-score-las/. That proposal updates the patient population data used to determine the LAS to include candidates and recipients from March 1, 2015 to March 31, 2018 and removes factors that no longer help predict waitlist or post-transplant survival. That proposal will affect the specific coefficients used in the calculation for these candidates.

[26] When the LAS was developed, the OPTN looked at the expected one year waitlist and post-transplant survival of candidates with the four most common diagnoses, emphysema/COPD, idiopathic pulmonary fibrosis, Cystic Fibrosis and portopulmonary hypertension because it was anticipated that the survival rates would be different based on diagnosis. This proved to be true. Since the sample sizes for other diagnoses were not large enough to build reliable diagnosis-specific mortality models, the less common diagnoses were grouped together with the more predictive diagnoses. For those that had sufficient numbers to be somewhat predictive, the data was analyzed to determine which group was most appropriate, and for those that did not have enough statistical information upon which to base a grouping decision, the decision was made on clinical grounds.

[27] Zaim, S., Chong, J. H., Sankaranarayanan, V., & Harky, A. (2020). COVID-19 and Multiorgan Response. *Current problems in cardiology*, Table 2: Clinical syndromes associated with COVID-19 in adults.

[28] Paolo Spagnolo, Elisabetta Balestro, Stefano Aliberti, Elisabetta Cocconcelli, Davide Biondini, Giovanni Della Casa, Nicola Sverzellati, and Toby M Maher. "Pulmonary fibrosis secondary to COVID-19: a call to arms." *The Lancet, Respiratory Medicine,* May 15, 2020. DOI:https://doi.org/10.1016/S2213-2600(20)30222-8

[29] Ibid.

The Lung Committee does not propose changing the categorization of these diagnoses as group D, which includes ARDS and pulmonary fibrosis, but proposes clearly identifying which of those patients' conditions have been brought on by COVID-19.

The Lung Committee discussed adding additional categories to further identify candidates with pre-existing conditions, such as chronic obstructive pulmonary disease (COPD), whose condition was significantly impacted by COVID-19. For these patients, a respiratory virus such as COVID-19 could exacerbate their COPD.[30] However, the Lung Committee preferred to continue to list these patients under their underlying, pre-existing disease, just as they would if another virus were the cause of the disease acceleration. In such cases, the impact of COVID-19 is not as clear as those where the lung disease was a direct result of COVID-19.

In current lung allocation policy, there is an option to request an exception if the transplant program does not believe the candidate's medical urgency is reflected in the LAS awarded based on their diagnosis. This will still be an option available in the instance that a specific patient's lungs are affected differently by COVID-19. Additionally, many differences in the health of such candidates would be accounted for in the LAS through the other measures of lung function that are used in the LAS equation.

Although the diagnosis is used in the calculation of LAS and allocation of lungs, other organ systems do not directly use the diagnosis in determining allocation order. Changes to add COVID-19 diagnosis options for any other organs would not require policy changes or affect the allocation order for those organs.

NOTA and Final Rule Analysis

The Lung Committee submits this proposal for community feedback under the authority of the OPTN Final Rule, which states, "An organ procurement organization or transplant hospital shall, as specified from time to time by the Secretary, submit to the OPTN…information regarding transplant candidates, transplant recipients, [and] donors of organs…."[31] The OPTN shall "advise transplant hospitals of the information needed for … listing"[32] and "maintain records of all transplant candidates, all organ donors and all transplant recipients"[33] and shall "…receive…such records and information electronically…"[34] This proposal will allow the OPTN to collect more complete data on candidates who need a transplant as a result of COVID-19 and maintain such data in the OPTN dataset.

The Final Rule also requires that when developing policies for the equitable allocation of cadaveric organs, such policies must be developed "in accordance with §121.8," which requires that allocation policies "(1) Shall be based on sound medical judgment; (2) Shall seek to achieve the best use of donated organs; (3) Shall preserve the ability of a transplant program to decline an offer of an organ or not to use the organ for the potential recipient in accordance with §121.7(b)(4)(d) and (e); (4) Shall be specific for each organ type or combination of organ types to be transplanted into a transplant candidate; (5) Shall

[30] Zheng, J., Shi, Y., Xiong, L., Zhang, W., Li, Y., Gibson, P. G., Simpson, J. L., Zhang, C., Lu, J., Sai, J., Wang, G., & Wang, F. (2017). The Expression of IL-6, TNF-α, and MCP-1 in Respiratory Viral Infection in Acute Exacerbations of Chronic Obstructive Pulmonary Disease. *Journal of immunology research*, *2017*, 8539294. https://doi.org/10.1155/2017/8539294.
[31] 42 CFR §121.11(b)(2).
[32] 42 CFR §121121.5(b).
[33] 42 CFR §121.11(a)(1)(ii).
[34] 42 CFR §121.11(a)(1)(iii).

be designed to avoid wasting organs, to avoid futile transplants, to promote patient access to transplantation, and to promote the efficient management of organ placement;…(8) Shall not be based on the candidate's place of residence or place of listing, except to the extent required by paragraphs (a)(1)-(5) of this section." This proposal:

- **Is based on sound medical judgment**[35] because it is an evidenced-based change relying on the following evidence:
    - Reports that patients with COVID-19 develop diagnoses that fall within diagnosis group D and are being listed and receiving lung transplants
    - Data showing the disease progression of patients who die from COVID-19
    - Data showing that COVID-19 causes organ damage
- **Seeks to achieve the best use of donated organs**[36] by ensuring organs are allocated and transplanted according to medical urgency. Adding the diagnosis to policy will provide the OPTN an opportunity to improve the mortality predictions in the future so that candidates with the same medical urgency are more likely to have similar LAS scores.
- **Is designed to avoid futile transplants**[37]**:** This proposal should not result in transplanting patients who are less likely to have favorable post-transplant outcomes. The LAS calculation balances waiting list mortality against post-transplant survival, and the diagnosis with which a candidate is listed factors into both parts of the equation. Adding the diagnoses to policy will also provide the opportunity for the OPTN to conduct post-implementation analysis to determine whether candidates transplanted after being diagnosed with COVID-19 have similar post-transplant outcomes to other lung transplant recipients.
- **Is not based on the candidate's place of residence or place of listing, except to the extent required to achieve** other regulatory requirements.[38] This proposal is not based on the candidate's place of residence or place of listing.

This proposal also preserves the ability of a transplant program to decline an offer or not use the organ for a potential recipient,[39] and it is specific to an organ type, in this case lung.[40]

Although the proposal outlined in this briefing paper addresses certain aspects of the Final Rule listed above, the Committee does not expect impact on the following aspects of the Final Rule:

- Is designed to avoid wasting organs[41]
- Is designed to…promote patient access to transplantation[42]
- Promotes the efficient management of organ placement[43]

The OPTN is providing the public with the opportunity to comment on these proposed policy changes in accordance with NOTA[44] and the OPTN Final Rule.[45]

[35] 42 CFR §121.8(a)(1).
[36] 42 CFR §121.8(a)(2).
[37] Ibid.
[38] 42 CFR §121.8(a)(8).
[39] 42 CFR §121.8(a)(3).
[40] 42 CFR §121.8(a)(4).
[41] 42 CFR §121.8(a)(5).
[42] Ibid.
[43] Ibid.
[44] National Organ Transplant Act (NOTA), as amended, 42 USC §274(b)(2)(I).
[45] OPTN Final Rule 42 CFR § 121.4 (b)(1), and (e).

Implementation Considerations

Member and OPTN Operations

The Lung Committee proposes implementing these changes to add lung diagnoses in group D. No transition procedures are necessary for this proposal, since there is not any group that would be disadvantaged by the changes. There are not candidates on the waiting list and awaiting transplantation prior to the implementation date of this policy change that will be treated less favorably than they would have been treated under the current policy. The proposal does not modify where any candidates currently awaiting transplant will appear on a match run, it instead simply defines the diagnoses more specifically for these patients.

As soon as possible following Board approval, the OPTN will implement these changes using an expedited timeline to allow collection of these data as quickly as possible given the fact that COVID-19 is a public health emergency, and these data have the potential to help with understanding long term impacts.

Operations affecting Transplant Hospitals

Transplant hospitals will have additional options when reporting candidate diagnoses, and may need to educate staff or coordinate with electronic medical records vendors.

Operations affecting Histocompatibility Laboratories

This proposal is not anticipated to affect the operations of histocompatibility laboratories.

Operations affecting Organ Procurement Organizations (OPOs)

This proposal is not anticipated to affect the operations of OPOs.

Operations affecting the OPTN

The proposal will require programming of changes in UNet.

Projected Fiscal Impact

Minimal or no fiscal impact to members.

Projected Impact on the OPTN

It is estimated that it will take less than 150 hours to implement this proposal.

Post-implementation Monitoring

Member Compliance

The Final Rule requires that allocation policies “include appropriate procedures to promote and review compliance including, to the extent appropriate, prospective and retrospective reviews of each

transplant program's application of the policies to patients listed or proposed to be listed at the program."[46] The proposed language will not change the current routine monitoring of OPTN members. Any data entered into UNet may be reviewed by the OPTN, and members are required to provide documentation as requested.

Policy Evaluation

The Final Rule requires that allocation policies "be reviewed periodically and revised as appropriate."[47]

This data collection proposal will be formally evaluated at approximately 3 months, 6 months, and 1 year post- implementation. The following metrics, and any subsequently requested by the committee will be evaluated as data become available (appropriate lags will be applied, per typical UNOS conventions, to account for time delay in institutions reporting data to UNet). For candidates and recipients with a COVID diagnosis the following metrics will be reported,

- The number of candidates by COVID diagnosis
- The demographics (age, gender, lung allocation score, and geographic area) of candidates by COVID diagnosis
- The number of recipients by COVID diagnosis
- The demographics (age, gender, lung allocation score, and geographic area) of recipients by COVID diagnosis
- The median time to transplant for candidates with a COVID diagnosis
- Comparison of the median time to transplant for candidates with a COVID diagnosis to those without a COVID diagnosis
- The waiting list mortality and post transplant patient survival rates for patients with a COVID diagnosis

Conclusion

Adding two COVID-19 diagnosis options for candidates listed for lung transplant will allow for faster identification of listing trends for these patients, and potential future refinements to the LAS calculation.

If appropriate and supported, similar diagnosis options could be added for other organ waitlists where it can be anticipated that there will be candidates listed for transplant as a result of damage from COVID-19. The Lung Committee would like feedback on:

- For lung, are there other diagnoses other than ARDS and pulmonary fibrosis that would be caused by COVID-19 and require lung transplantation?
- Are candidates for other organs being listed due to COVID-19 related organ failure?
- Should the OPTN establish COVID-19 related diagnosis codes for other organs?

[46] 42 CFR §121.8(a)(7).
[47] 42 CFR §121.8(a)(6).

Policy Language

Proposed new language is underlined (example) and language that is proposed for removal is struck through (~~example~~). Heading numbers, table and figure captions, and cross-references affected by the numbering of these policies will be updated as necessary.

10.1.F.i Lung Disease Diagnosis Groups

The LAS calculation uses diagnosis Groups A, B, C, and D as listed below.

Group A

A candidate is in Group A if the candidate has *any* of the following diagnoses:

- Allergic bronchopulmonary aspergillosis
- Alpha-1 antitrypsin deficiency
- Bronchiectasis
- Bronchopulmonary dysplasia
- Chronic obstructive pulmonary disease/emphysema
- Ehlers-Danlos syndrome
- Granulomatous lung disease
- Inhalation burns/trauma
- Kartagener's syndrome
- Lymphangioleiomyomatosis
- Obstructive lung disease
- Primary ciliary dyskinesia;
- Sarcoidosis with mean pulmonary artery pressure of 30 mm Hg or less
- Tuberous sclerosis
- Wegener's granuloma – bronchiectasis

Group B

A candidate is in Group B if the candidate has any of the following diagnoses:

- Congenital malformation
- CREST – pulmonary hypertension
- Eisenmenger's syndrome: atrial septal defect (ASD)
- Eisenmenger's syndrome: multi-congenital anomalies
- Eisenmenger's syndrome: other specify
- Eisenmenger's syndrome: patent ductus arteriosus (PDA)
- Eisenmenger's syndrome: ventricular septal defect (VSD)
- Portopulmonary hypertension
- Primary pulmonary hypertension/pulmonary arterial hypertension
- Pulmonary capillary hemangiomatosis
- Pulmonary telangiectasia – pulmonary hypertension
- Pulmonary thromboembolic disease
- Pulmonary vascular disease
- Pulmonary veno-occlusive disease

- Pulmonic stenosis
- Right hypoplastic lung
- Scleroderma – pulmonary hypertension
- Secondary pulmonary hypertension
- Thromboembolic pulmonary hypertension

Group C

A candidate is in Group C if the candidate has *any* of the following diagnoses:

- Common variable immune deficiency
- Cystic fibrosis
- Fibrocavitary lung disease
- Hypogammaglobulinemia
- Schwachman-Diamond syndrome

Group D

A candidate is in Group D if the candidate has *any* of the following diagnoses:

- ABCA3 transporter mutation
- Alveolar proteinosis
- Amyloidosis
- Acute respiratory distress syndrome or pneumonia
- Bronchioloalveolar carcinoma (BAC)
- Carcinoid tumorlets
- Chronic pneumonitis of infancy
- Constrictive bronchiolitis
- COVID-19: acute respiratory distress syndrome
- COVID-19: pulmonary fibrosis:
- CREST – Restrictive
- Eosinophilic granuloma
- Fibrosing Mediastinitis
- Graft versus host disease (GVHD)
- Hermansky Pudlak syndrome
- Hypersensitivity pneumonitis
- Idiopathic interstitial pneumonia, with at least one or more of the following disease entities:
  - Acute interstitial pneumonia
  - Cryptogenic organizing pneumonia/Bronchiolitis obliterans with organizing pneumonia (BOOP)
  - Desquamative interstitial pneumonia
  - Idiopathic pulmonary fibrosis (IPF)
  - Nonspecific interstitial pneumonia
  - Lymphocytic interstitial pneumonia (LIP)
  - Respiratory bronchiolitis-associated interstitial lung disease
- Idiopathic pulmonary hemosiderosis
- Lung retransplant or graft failure: acute rejection
- Lung retransplant or graft failure: non-specific
- Lung retransplant or graft failure: obliterative bronchiolitis-obstructive

- Lung retransplant or graft failure: obliterative bronchiolitis-restrictive
- Lung retransplant or graft failure: obstructive
- Lung retransplant or graft failure: other specify
- Lung retransplant or graft failure: primary graft failure
- Lung retransplant or graft failure: restrictive
- Lupus
- Mixed connective tissue disease
- Obliterative bronchiolitis: non-retransplant
- Occupational lung disease: other specify
- Paraneoplastic pemphigus associated Castleman's disease
- Polymyositis
- Pulmonary fibrosis: other specify cause
- Pulmonary hyalinizing granuloma
- Pulmonary lymphangiectasia (PL)
- Pulmonary telangiectasia – restrictive
- Rheumatoid disease
- Sarcoidosis with mean pulmonary artery pressure higher than 30 mm Hg
- Scleroderma – restrictive
- Secondary pulmonary fibrosis: (specify cause)
- Silicosis
- Sjogren's syndrome
- Surfactant protein B mutation
- Surfactant protein C mutation
- Teratoma
- Wegener's granuloma – restrictive