OPTN

Briefing to the OPTN Board of Directors on

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

OPTN Ad Hoc Disease Transmission Advisory Committee

Prepared by: Emily Ward, MPA
UNOS Policy and Community Relations Department

Contents

Executive Summary	2
Background	4
Purpose	6
Overall Sentiment from Public Comment	6
Proposal for Board Consideration	8
NOTA and Final Rule Analysis	15
Alignment with OPTN Strategic Plan	15
Implementation Considerations	15
Post-implementation Monitoring	18
Conclusion	20
Policy Language	22

OPTN

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

Affected Policies:	*1.2: Definitions* *2.2: OPO Responsibilities* *2.4: Deceased Donor Medical and Behavioral History* *2.5: Hemodilution Assessment* *2.7.A: Exceptions to HIV Screening Requirement* *2.9: Required Deceased Donor Infectious Disease Testing* *13.11: Receiving and Accepting KPD Match Offers* *14.1.A: Living Donor Psychosocial Evaluation Requirements* *14.3: Informed Consent Requirements* *14.4.A: Living Donor Medical Evaluation Requirements* *14.8.B: Living Donor Specimen and Storage* *14.9.B: Psychosocial and Medical Evaluation Requirements for Domino and Non-Domino Therapeutic Donors* *15.2: Potential Candidate Screening Requirements* *15.3.B: Donors with Risk Identified Pre-Transplant* *15.3.C: Recipients of Organs from Donors with Increased Risk of Disease Transmission* *16.3.D: Internal Labeling of Extra Vessels*
Sponsoring Committee:	*Ad Hoc Disease Transmission Advisory*
Public Comment Period:	*August 4, 2020 – October 1, 2020*
Board of Directors Date:	*December 7, 2020*

Executive Summary

This proposal revises OPTN policies to be in alignment with the most up to date U.S. 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

[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.

- Recipient testing and reporting
- Collection and storage of donor and recipient specimens

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 donated 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.

The community is overwhelmingly supportive of the proposed less restrictive risk criteria in an effort to increase the number of safe transplants overall. Substantive feedback from the community was received requesting changes to proposed new living donor storage requirements, pre-transplant testing, and HBV vaccination required data collection. While potential changes to the proposal are limited due to Final Rule requirements, one substantive change to the proposal resulted from public comment in an effort to allow the Guideline change to be more effective: Add required living donor consent to the proposed 10 year living donor specimen storage requirement.

[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

The Organ Procurement and Transplantation Network (OPTN) Final Rule, requires 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."[6]

Background: 2013 PHS Guideline

The *PHS Guideline* is intended to reduce the risk of unintended transmission of disease through organ transplantation. The 2013 *Guideline* added measures to assess and mitigate HBV and HCV risk.[7] 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 OPTN policies with the 2013 *Guideline* that were ultimately adopted by the OPTN Board of Directors.[8,9,10] In 2015, the final policy alignment, NAT testing, was implemented.

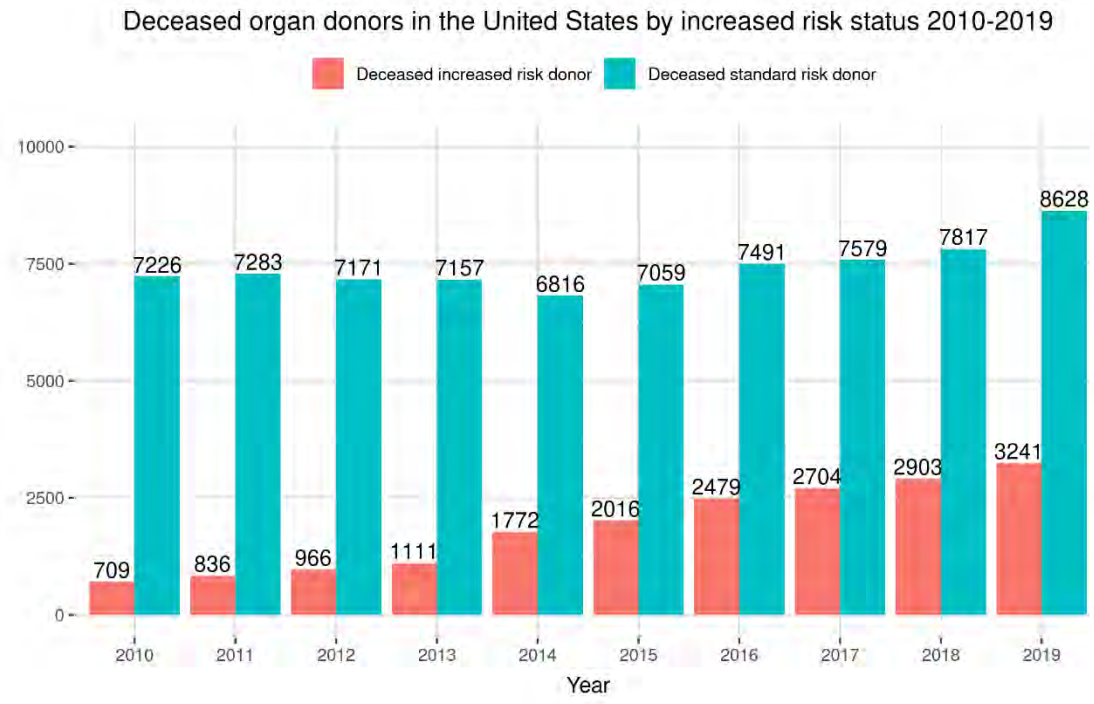
The CDC Responds the Community's Requests for Revisions

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. **Figure 1** below illustrates the significant increase from 2014-2019 in those deceased donors classified under the IRD designation.[11] There was concern in the transplant community that more donors were being classified as IRD 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.[12] Based on transplant community feedback and its own subject

[6] 42 C.F.R. §1 21.4(a)(2).
[7] 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.
[8] 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.
[9] 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.
[10] 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.
[11] OPTN data as of July 3, 2020.
[12] WE Abara, MG Collier, A Moorman, et al., "Trends in Deceased Solid Organ Donor Characteristics and Hepatitis B, C, and HIV

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.

Figure 1: Deceased Organ Donors in the U.S. by Risk Status, 2010-2019[13]



In response to this feedback and request, the CDC conducted and published a series of studies to inform the next steps to revise the 2013 *PHS Guideline*.[14,15,16,17]

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.[18]

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**.

[13] OPTN data as of July 3, 2020.

[14] 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.

[15] 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.

[16] 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.

[17] 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.

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

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
- The 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 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.[19]

In response to release of the Guideline, an OPTN workgroup aligned Policy in this proposal. 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
- Professional Organizations: American Society of Transplantation (AST), American Society of Transplant Surgeons (ASTS), Association of Organ Procurement Organizations (AOPO), and NATCO
- Federal Government: Health Resources and Services Administration (HRSA) and CDC

Purpose

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." [20]

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…."[21]

This proposal was issued for public comment from August 4, 2020 to October 1, 2020. The feedback is described below.

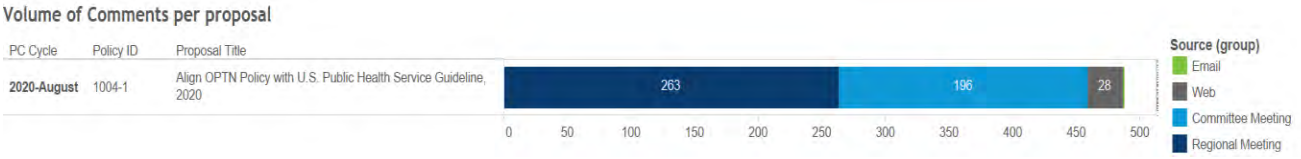
Sentiment from Public Comment

Committee leadership provided presentation of the proposal to 16 committees, 11 regions, and additionally produced a recorded webinar that was posted on the OPTN website for public view. Seven professional organizations and numerous OPOs, transplant programs and individuals provided written

[19] Revised recommendations available at http://dx.doi.org/10.15585/mmwr.rr6904a1.
[20] 42 C.F.R. §121.4(a)(2).
[21] 42 CFR §121.11(b)(2).

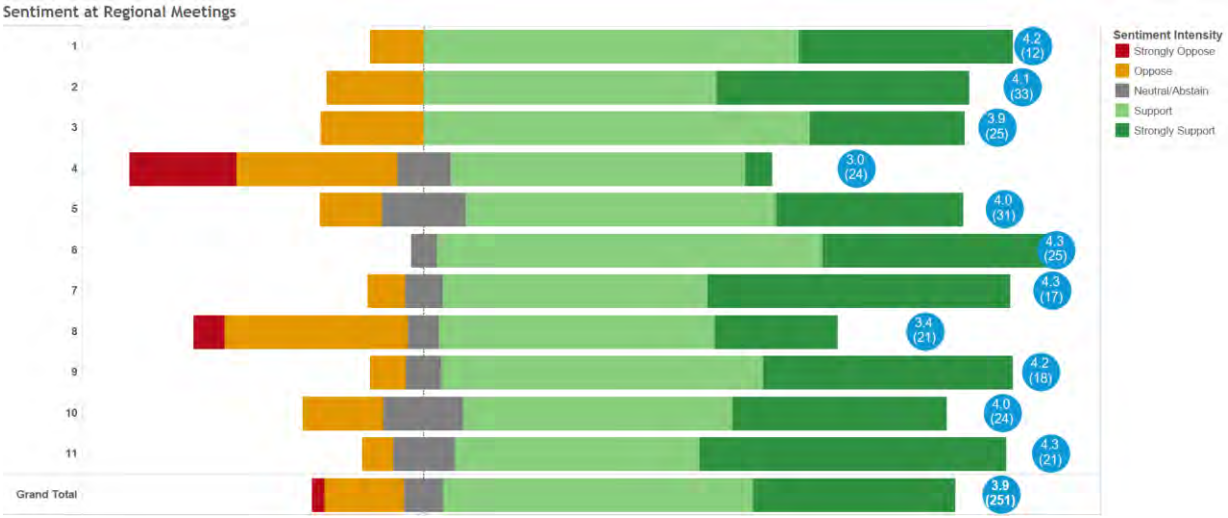
public comment. The transplant community was overall supportive of the proposal, indicated by 85 percent of sentiment scores for support or strongly support options. Sentiment is detailed below in **Figures 2-4:**

Figure 2: Volume of Comments, Align OPTN Policy with U.S. Public Health Service Guideline, 2020



The proposal recorded 487 sentiment scores, as indicated in **Figure 2** above, with approximately 11 percent of those providing a written comment.[22]

Figure 3: Sentiment at Regional Meetings, Align OPTN Policy with U.S. Public Health Service Guideline, 2020[23]

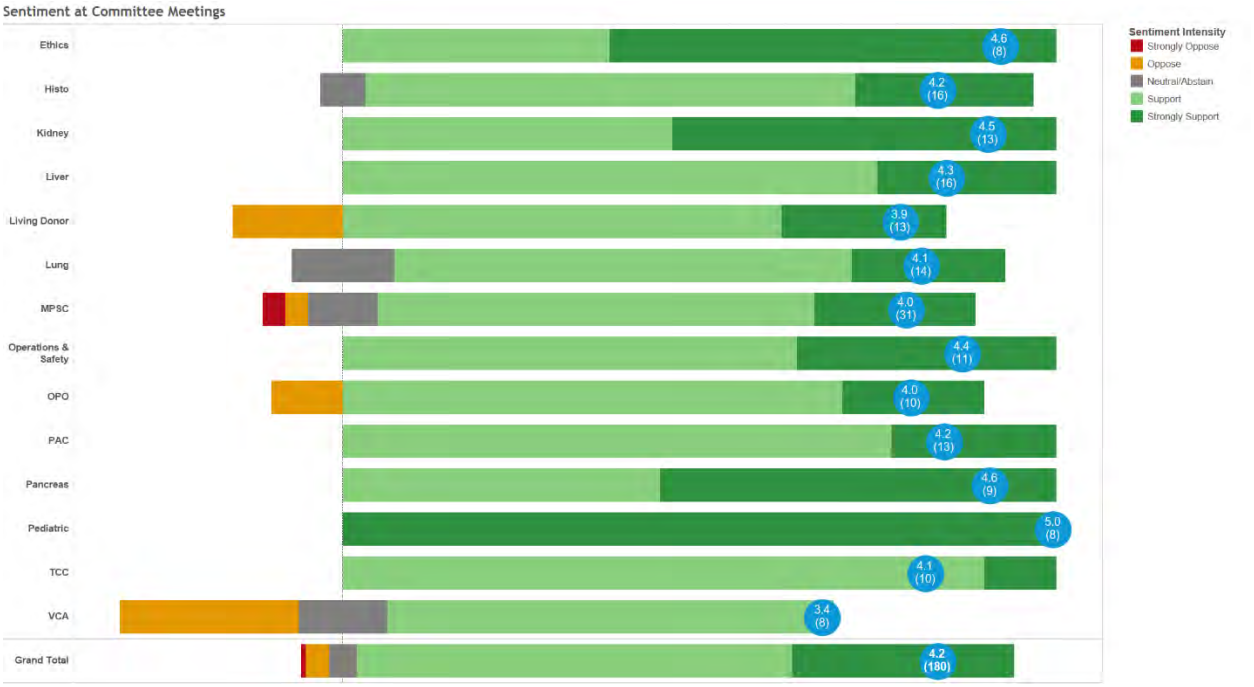


The proposal was presented at 11 regional meetings in which 251 sentiment scores were recorded. Regional sentiment resulted in 80 percent support or strongly support.

[22] This chart shows the sentiment for the public comment proposal. Sentiment is reported by the participant using a 5-point Likert scale (1-5 representing Strongly Oppose to Strongly Support). Sentiment for regional meetings only includes attendees at that regional meeting. Region 6 uses the average score for each institution. The circles after each bar indicate the average sentiment score and the number of participants is in the parentheses.

[23] Ibid.

Figure 4: Sentiment at Committee Meetings, Align OPTN Policy with U.S. Public Health Service Guideline, 2020[24]



The majority of OPTN Committees providing sentiment scores supported or strongly supported the proposal. Sixteen committees received the proposal presentation, with fourteen providing a sentiment score. The Transplant Administrators Committee (TAC) and the Data Advisory Committee (DAC) did not provide a sentiment score. The TAC provided a written comment. Overall support for the proposal exists, but some members expressed opposition to specific testing and living donor specimen storage requirements. The committee considered and discussed this, and collaborated with HRSA on what would be allowable post-public comment changes.

The DAC leadership received an informational overview on 12/2/2020 to inform of proposed HBV vaccination data collection. There were no concerns.

Proposal for Board Consideration

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. [25]

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

[24] Ibid.
[25] Ibid.

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; removal of using term "increased risk donor"
2. Living and deceased solid organ donor testing: Requirement for universal testing for HIV, HBV, and HCV on all donors
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 the OPTN
5. Collection and storage of donor and recipient specimens: Requirement to store living donor blood specimens for at least 10 years; require disclosure as part of existing Living Donor informed consent

This proposal contains policy changes related to all areas where the *PHS Guideline* has been revised. The OPTN Policy definition for the *PHS Guideline* is 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 requiring Hepatitis B vaccination for candidates. However, the OPTN requirement to be consistent with CDC recommendations is for donor testing and recipient follow up. The OPTN does not currently have explicit authority to require candidates to accept a vaccine as a condition of eligibility for transplant. Proposed policy would require that transplant programs assess whether the candidate has been vaccinated for HBV and, if not, to ascertain the reason not vaccinated. HBV vaccination status and reason if not vaccinated would then be reported to the OPTN.

In addition, the proposal contains slightly expanded timeframes for post-transplant recipient testing as proposed in public comment based on community feedback. The Committee believes the proposed timeframes are consistent with the CDC recommendations while still accommodating operations and recipient follow up activities without compromising the intent or patient safety.

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

1. Risk assessment of living and deceased donors

- Change the 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.

Unanimous support was indicated during public comment for a shortened risk criteria timeframe from the current 12 months for all criteria for a donor to be considered "high risk." While supportive, one OPO suggested three months and one professional association suggested six months.

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. Some members have expressed concern 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. Regions 8, 3, and 5 suggest that hemodilution should remain as a risk criteria. Reasons cited include need for hemodilution information for ABO identification and for infectious disease serology. Most commenters did not provide a reason for opposition or cited support for removal of hemodilution as a risk criteria for HIV/HBV/HCV as proposed, but requested it remain as a requirement to report this for reasons other than infectious disease compliance. Some comments were unclear and there may have been confusion among commenters whether hemodilution is proposed to be removed entirely from policy or whether this is proposed to be removed only as a risk criteria, which is accurate. The current proposal removes hemodilution as a PHS risk criteria but keeps the overall requirement to perform the assessment.

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 donors designated as high risk or increased risk.[26,27] 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.

Several regions, the Heart Committee, and the American Society of Transplantation (AST) a few individuals endorsed removal of this term during public comment. There is concern that there will be a lack of consistent terminology used to educate patients on risk of HIV/HCV/HBV and also inability to distinguish between risk of expected disease transmission and organs at high risk of disease despite negative results. Many commenters requested the need for guidance to ensure consistency in new suggested terminology.

The Committee proposes no change to the **risk assessment of living and deceased donors** from public comment to Board proposal.

2. Living and deceased solid organ donor testing

- Add new required testing for all potential living and deceased organ donors:
    - HIV: NAT
    - HBV: NAT

[26] 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.
[27] 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.

- 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. [28] 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.

The OPO community expressed widespread concern during public comment, citing that several challenges in requiring testing within 96 hours of procurement. Requests to allow for greater flexibility or remove the timeframe were numerous. Concerns about delay in organ allocation and need to re run matches due to positive test results may potentially lead to a decrease in transplant volume. Rapid deceased after cardiac death (DCD) donation may be inhibited due to necessity for repeat testing within 96 hours. The risk of disease transmission after a donor enters the hospital is greatly reduced after admittance, likely reducing the need for repeat (if not within 96 hours) testing. Costs of administering additional testing my not reduce risk of disease transmission. Although the Committee thought these were valid concerns they decided to keep the 96 hour requirement in the policy proposal given that this is the period included in the revised PHS Guideline and given the regulatory requirement that OPTN policies on the testing of organ donors be consistent with recommendations of the Centers for Disease Control and Prevention to prevent the spread of infectious diseases.

The Committee proposes no change to **living and deceased solid organ donor testing** from public comment to Board proposal.

3. Transplant candidate informed consent

- Remove requirement to obtain specific “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 low 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

[28] 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.

of specific donor risk factors could cause a breach in confidentiality of the donor's health information. Members of the PHS WG made inquiries about how much should be disclosed to the recipient. Given the differences in transplant practices, the CDC ex-officio DTAC member explained that CDC did not want to be too prescriptive regarding this requirement. [29,30]

Several regions commented in support of the removal of a separate informed consent documentation to accept organs with risk factors, but encouraged additional guidance on how providers should conduct the informed consent discussion that is proposed. Patient populations expressed concern that this change may undermine patient autonomy in the decision process. Request for robust education on the proposed patient and provider risk conversation that replaces informed consent documentation is requested.

The Committee proposes no change to **transplant candidate informed consent** from public comment to Board proposal.

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 requirement that transplant programs must assess if the candidate has been vaccinated for HBV and, if not, to ascertain the reason not vaccinated. Candidate self-report will be an acceptable method of assessment. HBV vaccination status and reason if not vaccinated must be reported to the OPTN.
- 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.[31] Therefore, the Committee believes that this recommendation is consistent with the 2020 *Guideline*.

[29] ML Volk, "The 'PHS increased risk' label'".
[30] TL Pruett, "Deceased organ donors and PHS risk identification".
[31] 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.

While most regions and committees provided no comment on universal post-transplant testing during public comment, transplant administrators expressed concern about how this cost for testing would be provided and if it may be a financial burden on patients. Some commenters felt testing all recipients was excessive due to a low rate of potential disease transmission. The Pediatrics Committee and several individuals in regional meeting requested reconsideration to mandate this for pediatric recipients, since additional blood tests may negatively affect this more vulnerable population. Guidance on how to conduct universal testing was requested.

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 for transplant.

The community was in overwhelming agreement that HBV vaccination should not be required in policy, but some commented that vaccination was standard center protocol or expressed encouragement that this should administered as a standard. Transplant administrators commented on the administrative burden to operationalize documentation of why vaccination was not completed and questioned if this should be the responsibility of hospitals. Several regions, hospitals, and the AST suggested that only HBV immunity status be required in policy.

While response during public comment was mixed, it is recommended by the committee that required data collection on HBV vaccination status be included in this proposal to assess the effectiveness and practice associated with the 2020 Guideline recommendation on HBV vaccination. Programs will be required to report vaccination status to the OPTN, and also report 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.

The Committee proposes no substantive change to **recipient testing and reporting** from public comment to the Board proposal.

5. Collection and storage of donor and recipient specimens

- 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 required disclosure to existing Living Donor informed consent policy to obtain and store a living donor blood specimen for ten years, only to be used for investigation of potential donor-derived disease.
- Add OPO requirement to gather specimen for storage within 24 hours of organ procurement for deceased donors.
- 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 specimens 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.[32]

This new storage requirement was of most concern to all regions, committees, and societies during public comment. All are in opposition of this proposed timeframe. Many commenters suggested that the 10 year requirement should not be in policy or should be changed to 1 or 2 years. Many transplant center administrators, including the Transplant Administrators Committee, are concerned about additional cost and logistics in storing or arranging storage for living donor specimen. Many commenters cited lack of CDC data to require the 10 year timeframe and inability to comment on this when the new proposed PHS Guideline was released on the federal register for public comment in August, 2019.

The Living Donor Committee, in addition to the Patient Affairs Committee and patient representatives on other OPTN committees expressed concern for living donor privacy in requiring specimen storage. There is concern the proposed change may dissuade donation from living donors.

The Committee, with input from the Living Donor Committee, created additional language to include with existing Living Donor informed consent policy in response to public comment feedback. Required language that recovery hospitals must disclose the proposed required ten year storage of living donor specimen sample ensures that living donor samples would be used only for potential unexpected disease transmission. This change is an effort to protect privacy and ensure specimens are not used for unintended purpose.

While the Committee acknowledges widespread opposition to the 10 year living donor specimen storage requirement, it proposes leaving the requirement in the proposal to remain consistent with the Guideline.

The Committee proposes one change to collection and storage of donor and recipient specimens from public comment to Board proposal: the addition of living donor informed consent for 10 year specimen storage.

In addition to policy language revisions, additional follow up actions will be considered upon approval of the proposal:

- 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

[32] OPTN DTAC PHS Workgroup Meetings, July 2, 8, and 14, 2020. Minutes available upon request.

NOTA and Final Rule Analysis

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."[33] 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…."[34]

Alignment with OPTN Strategic Plan[35]

Increase the number of transplants and Promote living donor and transplant recipient safety:
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. The intent of the proposal is to increase the number of transplants, while ensuring patient safety.

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, development of storage protocols, and updates to living donor informed consent protocol. Additional time is needed to create storage agreements, so this component will be implemented on June 1, 2021 instead of March 1, 2021 to allow living donor recovery programs to ready for this new requirement.

Modifications to living donor, candidate, and recipient testing and living donor consent protocol 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 HBV vaccination status including reason if HBV vaccination cannot be completed or initiated prior to transplant.

[33] 42 CFR §121.4(a)(2)
[34] 42 CFR §121.11(b)(2)
[35] For more information on the goals of the OPTN Strategic Plan, visit https://optn.transplant.hrsa.gov/governance/strategic-plan/.

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 will create educational materials to support members with the changes included in this proposal. The OPTN estimates creating these resources will require approximately 200 hours.

Compliance estimates 100 hours to modify monitoring tools and development of new tools, participation in project implementation meetings, and assistance with educational efforts tied to the project.

This proposal will require the submission of official OPTN data that are not presently collected by the OPTN. The OPTN Contractor has agreed that data collected pursuant to the OPTN's regulatory requirements in §121.11 of the OPTN Final Rule will be collected through OMB approved data collection forms. Therefore, after OPTN Board approval, the forms will be submitted for OMB approval under the Paperwork Reduction Act of 1995.[36] This will require a revision of the OMB-approved data collection instruments, which may impact the implementation timeline.

[36] Organ Procurement and Transplantation Network Contract HHSH250201900001C, Performance Work Statement at Task 3.5: Collect official OPTN data to support the operations of the OPTN.

This proposal will require programming in UNet[SM], DonorNetMobile[SM] application, and TransNet[SM] as outlined below. If approved by the Board of Directors, the programming will be added to the schedule of work (e.g. IT roadmap) and prioritized to align with the implementation of aligning policy.

- The Transplant Recipient Registration (TRR) forms in Transplant Information Electronic Data Interchange (TIEDI®) will have new data collection for recipient hepatitis B vaccination status.
- The viral detection section on the Transplant Recipient Follow-up (TRF) forms in TIEDI® will be available on all 6 month TRF's regardless of organ type the recipient received, or the donor's criteria met for infectious disease transmission.
- Serology label for "anti-HBc" will be updated to "total anti-HBc" in UNetSM to align to policy language.
- On DonorNetMobile[SM] the label of "PHS Risk" will be updated to align with the policy and guidelines which remove the "PHS Increased Risk" designation.
- On TransNetSM the label of "PHS Increased Risk" will be updated to align with the policy and guidelines which remove the "PHS Increased Risk" designation on the TransNetSM system as well as the printed labels for extra vessels.

Along with programming, members will also update labels used for extra vessels.

Upon implementation of proposed OPTN policy associated with this proposal, current published guidance (*Understanding HIV, Hepatitis C, and Hepatitis B from Increased Risk Donors, June 2017*) will be rescinded. This is included in **Appendix B**.

Projected Fiscal Impact

Projected Impact on Organ Procurement Organizations

There may be costs associated with repeat NAT testing if repeat testing needed 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 by 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.

Post-implementation Monitoring

Member Compliance

In addition to the monitoring described below, the OPTN 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 14.3 Informed Consent Requirements: Site surveyors will continue to review a sample of living donor medical records to verify that the recovery hospital obtained and documented informed consent from the living donor as required by OPTN policy. Based on the proposed policy changes, surveyors will verify that the recovery hospital disclosed to living donors that it is required to obtain and store a living donor blood specimen for ten years only to be used for investigation of potential donor-derived disease.

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.
- The percent of deceased donor samples for all required HIV, HCV and HBV testing that have been obtained within 96 hours of organ procurement.

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 community is overwhelmingly supportive of the proposed less restrictive risk criteria in an effort to increase the number of safe transplants overall. Substantive feedback from the community was received requesting changes to proposed new living donor storage requirements, pre-transplant testing, and HBV vaccination documentation. One substantive change to the proposal resulted from public comment, within legal constraint per HRSA guidance:

- Add required consent to existing Living Donor consent policy for required 10 year living donor specimen storage

Other changes made post-public comment include:

- Clarify policy language that anti-HBc testing and label requirements are "total" anti-HBc
- Remove policy language referring to the requirement to use a "FDA approved" hemodilution calculation algorithm following feedback from FDA that the organization does not actually approve these algorithms
- Clarify policy language to clarify that HBV vaccination status must be reported in addition to the reporting the reason for not initiating or completing vaccination.

The policy language aligns policy to CDC recommendations, as required by the Final Rule.[37]

[37] 42 CFR §121.4(a)(ii)

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.

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

The medical and behavioral history for each potential deceased donor must include all of the following:

1. Any testing and laboratory results used to identify the presence of transmissible diseases or malignancies, treated and untreated, or any other known condition that may be transmitted by the deceased donor organ and may reasonably impact the recipient.

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 Services* ~~(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 Clinical Laboratory Improvement Amendments (CLIA) ~~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 (total 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 following members:	Must:	Within:
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 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 Services~~*~~ (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.

14.3 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 *14-4*. Documentation of informed consent must be maintained in the living donor medical record.

156 **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 18.4: 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. c. <u>Obtain and store a living donor blood specimen for ten years, only to be used for investigation of potential donor-derived disease.</u> 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:

The recovery hospital must:	These elements of informed consent :
	a. Allergic reactions to contrast b. Discovery of reportable infections 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

157

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 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

This evaluation must be completed:	Including evaluation for and assessment of this information:
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)

This evaluation must be completed:	Including evaluation for and assessment of this information:
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. 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 (total 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.

This evaluation must be completed:	Including evaluation for and assessment of this information:
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

14.8.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

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 (total 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 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.

As part of the candidate's medical evaluation, an assessment for the need to provide HBV vaccination must occur. The transplant program must report the candidate's HBV vaccination status to the OPTN. 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.[38]

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.

[38] The language in this paragraph is substantially similar to the original proposal on HBV vaccination status reporting that was sent to public comment in August of 2020. The Ad Hoc Disease Transmission Advisory Committee decided to relax the data collection requirement in the proposal at its meeting on October 26, 2020. The Committee revisited the issue at its December 1, 2020 meeting and voted on the language presented here. Due to the timing of the second meeting, a previous version of this Briefing Paper had the October 26 language. This Briefing Paper accurately reflects the Committee's approved proposal to the Board of Directors.

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 Required Post-Transplant Infectious Disease Testing

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.~~ Ttreatment 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	●	●

This information must be included:	On the rigid container:	On the outermost layer of the triple sterile barrier:
4. Recovery date	●	●
5. Description of the container contents	●	●
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. **total 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** • **total 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*	●	●

#

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

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	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	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.

Recommendation Category	2013	2020	OPTN Policy
	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		
	• 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.

Recommendation Category	2013	2020	OPTN Policy
	• 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*).
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.

Recommendation Category	2013	2020	OPTN Policy
	o 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.	• *15.2 Candidate Pre-Transplant Infectious Disease Reporting and Testing Requirements* No current OPTN policy. Proposed policy to require transplant hospitals to assess the need to provide HBV vaccination during candidate medical evaluation and report status. If candidate is not vaccinated, reason not vaccinated must be reported and documented.
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. • *14.3 Informed Consent Requirements* No OPTN policy requirement exists for living donor informed consent

Recommendation Category	2013	2020	OPTN Policy
			for obtaining and storage of blood specimens since this is a new proposed policy. Proposed policy includes additional specific disclosure to living donors that blood specimen will be obtained and stored for ten years, only to be used for investigation of potential donor-derived disease.
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* Current 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.

[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.

Appendix B: PHS Guidance June 2017

~~*Understanding the Risk of Transmission of HIV, Hepatitis B, and Hepatitis C from U.S. PHS Increased Risk Donors*~~

~~Summary and Goals~~

~~In July 2013, the U.S. Public Health Service (PHS) published new guidelines for reducing human immunodeficiency virus (HIV), hepatitis B virus (HBV), and hepatitis C virus (HCV) transmission during organ transplantation.[39] The federal regulation governing the operations of the Organ Procurement and Transplantation Network (OPTN Final Rule) requires that the OPTN/UNOS Board of Directors develops policies that are consistent with the recommendations of the Centers for Disease Control and Prevention (CDC) regarding testing potential organ donors and following transplant recipients to prevent donor-to-recipient transmission of infection. Subsequently, the Board voted to modify existing OPTN/UNOS policies defining which groups qualify as increased risk donors, and to require nucleic acid testing (NAT) of all donors for HCV. Additionally, the Board required NAT or antigen/antibody (Ag/Ab) combination HIV testing for increased risk donors.~~

~~Since implementation of the new policies, the number of potential deceased donors classified as increased risk has increased to almost one in five donors nationally.[40] Research studies have demonstrated that organs from donors classified as increased risk are less likely to be used than organs from non-increased risk donors.[41,42] This finding persists despite the fact that post-transplant graft and patient survival with increased risk organs is equal to or better than that with non-increased risk organs.~~

~~When a person becomes infected, it takes some time for the infection to be detected in the body; this is called the "window period". The use of NAT markedly shortens the window period. Survey data have demonstrated that most non-physician transplant providers would like further education regarding the risk of infection associated with increased risk donors. Survey data also show that patients have limited understanding and many misconceptions regarding the definition and implications of the increased risk designation.[43, 44] Accordingly, the OPTN/UNOS Disease Transmission Advisory Committee (DTAC), the American Society of Transplantation (AST), the American Society of Transplant Surgeons (ASTS), and the North American Transplant Coordinators Organization (NATCO) provide this guidance document to help transplant~~

~~[39] Seem, DL, Lee, I, Umscheid, CA, Kuehnert, MJ, "United States Public Health Service. PHS Guideline for Reducing Human Immunodeficiency Virus, Hepatitis B Virus, and Hepatitis C Virus Transmission Through Organ Transplantation," *Public Health Reports* 128, no. 4 (2013): 247-343.~~

~~[40] Kucirka, LM, Bowring, MG, Massie, AB, Luo, X, Nicholas, LH, Segev, DL, "Landscape of Deceased Donors Labeled Increased Risk for Disease Transmission Under New Guidelines," *American Journal of Transplantation* 15, no. 12 (2015): 3215-3223.~~

~~[41] Duan, KI, Englesbe, MJ, Volk ML, "Centers for Disease Control 'High-Risk' Donors and Kidney Utilization," *American Journal of Transplantation* 10, no. 2 (2010):416-420.~~

~~[42] Volk, ML, Wilk, A, Wolfe, C, Kaul, DR, "The 'PHS Increased Risk' Label is Associated with Non-Utilization of Hundreds of Organs per Year," (presentation, American Transplant Congress. Boston, MA, June 11-15, 2016).~~

~~[43] Gordon, EJ, Mullee, J, Beauvais, N, Warren, E, Theodoropoulos, N, McNatt, G, et al, "Education and Informed Consent About Increased Risk Donor Kidneys: A National Survey of Non-physician Transplant Providers," *Transplant Infectious Disease* 16, no. 2 (2014): 251-260.~~

~~[44] Gordon, EJ, Reddy, E, Ladner, DP, Friedewald, J, Abecassis, MM, Ison, MG, "Kidney Transplant Candidates' Understanding of Increased Risk Donor Kidneys: A Qualitative Study," *Clinical Transplantation* 26, no. 2 (2012):359-368.~~

~~professionals better understand the low risk of window period infection present in PHS increased risk donors.~~

~~This resource tool is intended to give educational support for Organ Procurement Organizations (OPOs) and transplant hospitals and is for voluntary use by members. This resource is not OPTN policy, so it does not carry the monitoring or enforcement implications of policy. It is not an official guideline for clinical practice, nor is it intended to be clinically prescriptive or to define a standard of care.~~

CONTENTS

Summary and Goals 43
Executive Summary 46
Window Periods with Serologic and Nucleic Acid Testing 46
Changes to Increased Risk Donor Definition 47
Risk Associated with Specific Exposures 50
Consequences of Transmission of HIV, Hepatitis B, and Hepatitis C 54
Risk of Declining the Organ from a Donor with the PHS Characteristics for Increased Risk of HIV, HCV or HBV Infection and Remaining on the Waiting List 54
Risk of Acquiring Hepatitis C While on Dialysis 55
Limitations to Current Screenings 55
Pediatric Organ Transplant Considerations 55
Conclusion 56

~~Executive Summary~~

~~The following summary is provided to help transplant professionals accurately counsel potential organ transplant candidates on the relative risks associated with donors classified as PHS increased risk.~~

- ~~The increased risk donor classification serves principally to identify those donors most at risk of having recent infection with HIV, HBV, or HCV.~~
- ~~Increased risk donor classification does not mean that the organ is of lower quality.~~
- ~~Choosing to accept an organ from an increased risk donor entails balancing donor and recipient characteristics. In many cases, the risks of declining such an organ offer may be greater than the risk of donor-derived viral infection.~~
- ~~The risk of window period infection with HIV, HBV, or HCV, and therefore the risk of virus transmission from donor to recipient, is extremely small if a risk behavior occurred more than three weeks prior to NAT.~~
- ~~There is wide variation in viral transmission risk even within donors classified as increased risk donors. Donors with a history of incarceration or less safe sexual practices are generally much lower risk than donors with a history of intravenous drug use (IVDU).~~
- ~~Even under the highest risk behavior, the risk of HIV, HBV, or HCV transmission from a NAT negative donor organ is low (around 1% or less).~~
- ~~Ultimately, with appropriate counselling and informed consent, we aim to maximize organ availability.~~

~~Window Periods with Serologic and Nucleic Acid Testing~~

~~Persons who had developed a HIV, HBV, or HCV infection several months prior to organ donation would be discovered by the routine serological (antibody) tests performed on all potential donors. However, there is the chance that exposure to HIV, HBV, or HCV in the days immediately prior to death could not be detected by serological (antibody) tests due to insufficient amount of antibodies against a specific virus. Additionally, substantial blood loss and hemodilution can also create an environment for false negative serological test results.~~

~~The concept of "increased risk" (previously referred to as "high risk") donors was created to identify such a population of deceased or living donors potentially at risk for ***recent*** acquisition of HIV or viral hepatitis. These recently infected donors would therefore be capable of inadvertently transmitting the virus to recipients, yet would appear negative on serologic testing. Importantly, most increased risk donors will be truly negative for each of these infections, and the classification does in no way reflect the quality of the organs donated.~~

~~Nucleic Acid Testing, which has been used with increasing frequency over the last decade, is now required by OPTN Policy (for HCV and HIV) for all increased risk donors.[45] The NAT window period is very short, so NAT testing can result positive much closer to the time of infection compared to serological testing. Behaviors resulting in transmissible infection would have had to occur within ***5-6 days*** (HIV) or ***3-5 days*** (HCV) before blood samples were obtained for disease screening. The window period for HBV (***20-22 days***) is longer than for~~

[45] ~~OPTN Policy 2.9 (*Required Deceased Donor Infectious Disease Testing*)~~

HIV and HCV. The Table 1 below describes the time from infection to detection associated with different serological or NAT methods.[46]

Table 1: Estimates of window period length for different testing methods*

Pathogen	Standard Serology	Enhanced Serology (fourth generation or combined antibody-antigen tests)	Nucleic Acid Testing
HIV	17-22 days (5-8)	~7-16 days (9, 10)	5-6 days (5,6)
HCV	~70 days (5, 8, 11)	~40-50 days (12-14)	3-5 days (5, 11)
HBV	35-44 days (15, 16)	Not applicable	20-22 days (8,15)

*Window period = time to detection of infection by a specific testing method. HIV, HCV, and HBV NAT data are listed for the most sensitive NAT currently used in blood donor screening (Gen Probe TMA for HIV and HCV, and Roche Cobas MPX for HBV on individual donation); the window period will be longer if less sensitive NAT is used for donor screening. HIV- and HCV-antibody and HBV surface antigen data are for tests licensed and current used in blood donor screening (enzyme immunoassays or chemiluminescent assays). Window period estimates for fourth generation assays are derived from more limited data and show substantial variation with different manufacturer's test kits.

Changes to Increased Risk Donor Definition

Prior to the 2013 PHS guideline, the 1994 guideline was intended to identify risk factors for HIV only. Table 2 below summarizes the differences between the 1994 and 2013 increased risk donor guidelines criteria:

Table 2: Comparison of 1994 CDC High Risk and 2013 U.S. PHS Increased Risk Guidelines

1994 Guideline	2013 Guideline
MSM* in the preceding 5 years	MSM in the preceding 12 months
Non-medical injection drug use in preceding 5 years	Non-medical injection drug use in preceding 12 months
Sex in exchange for money/drugs in preceding 5 years	People who have had sex in exchange for money or drugs in the preceding 12 months
People who have had sex with a person known or suspected to have HIV infection in the preceding 12 months	People who have had sex with a person known or suspected to have HIV, HBV, or HCV infection in the preceding 12 months
Women who have had sex with a man with a history of MSM behavior in the preceding 12 months	Women who have had sex with a man with a history of MSM behavior in the preceding 12 months

[46] Humar A, Morris M, Blumberg E, Freeman R, Preiksaitis J, Kiberd B, et al, "Nucleic Acid Testing (NAT) of Organ Donors: Is the 'Best' Test the Right Test? A Consensus Conference Report," *American Journal of Transplantation* 10, no. 4 (2010):889-899.

~~1994 Guideline~~	~~2013 Guideline~~
~~People who have had sex with a person who had sex in exchange for money or drugs in the preceding 12 months~~	~~People who have had sex with a person who had sex in exchange for money or drugs in the preceding 12 months~~
~~People who have had sex with a person who injected drugs by intravenous, intramuscular, or subcutaneous route for nonmedical reasons in the preceding 12 months~~	~~People who have had sex with a person who injected drugs by intravenous, intramuscular, or subcutaneous route for nonmedical reasons in the preceding 12 months~~

1994 Guideline	2013 Guideline
A child who is ≤18 months of age and born to a mother known to be infected with, or at increased risk for HIV infection (should not be used)	A child who is ≤18 months of age and born to a mother known to be infected with, or at increased risk for HIV, HBV, or HCV infection
A child who has been breastfed in the past 12 months by a mother known to have or at risk for HIV infection	A child who has been breastfed within the preceding 12 months and the mother is known to be infected with, or at increased risk for, HIV infection
Inmates of correctional systems	People who have been in lockup, jail, prison, or a juvenile correctional facility for more than 72 consecutive hours in the preceding 12 months
Persons whose history or physical, exam, medical records, or laboratory reports indicate sexually transmitted disease	People who have been newly diagnosed with, or have been treated for, syphilis, gonorrhea, Chlamydia, or genital ulcers in the preceding 12 months
Not listed	People who have been on hemodialysis in the preceding 12 months (hepatitis C only)
Not listed	When a deceased potential organ donor's medical/behavioral history cannot be obtained or risk factors cannot be determined, the donor should be considered at increased risk for HIV, HBV, and HCV infection because the donor's risk for infection is unknown
Persons who cannot be tested for HIV infection because of refusal, inadequate blood samples (e.g. hemodilution that could result in false-negative tests), or any other reasons	When a deceased potential organ donor's blood specimen is hemodiluted, the donor should be considered at increased risk for HIV, HBV, and HCV infection because the donor's risk for infection is unknown

*MSM=men who have sex with men

The transition from the 1994 to 2013 guideline occurred between August 2013 and February 2014. Beginning in February 2014, only the new guideline could be used. The percentage of donors classified as increased risk donors who had organs procured increased from 12.3% to 19.5%, and exceeded 25% in 14 OPOs.[47] The exact reasons for this increase are unknown, but may be related to increased numbers of potential donors who died from opioid overdoses.

Risk Associated with Specific Exposures

As described above, a potential donor may be labeled as increased risk for a variety of different exposures, and these exposures carry very different risks of transmitting recent infection with HIV, HBV, or HCV. For example, a potential donor who was in a county jail 10 months ago for a period of 3 days would be at much lower risk of acquiring HCV or HIV in the preceding week as compared to a potential donor whose cause of death was opioid overdose from IVDU. Table 3 below is based on modeling data and describes the estimated risk of window period infection (both as risk per 10,000 donors and as a percentage). The table is designed to estimate the average risk irrespective of when the test was completed (remote infection should result in a positive antibody test).[48, 49] The ELISA columns refer to the number of donors in the serological window period based on serology (antibody) testing only; the NAT columns refer to the number of donors with negative NAT who are in the NAT window period. NAT reduces the risk of serological window period infection by about 10-fold for most exposures.

Even with NAT, there is still some risk of transmission. However, not all donors with the PHS characteristics carry the same risk of window period infection. For example, donors with recent IVDU with negative serological testing still have a risk of undetected HCV of 300.6 per 10,000 donors (3%). Having both negative serology and negative NAT reduces this risk to 32.4 out of 10,000 donors (0.3%). In contrast, donors with a history of incarceration within the previous 12 months and negative NAT and serology testing would have only a 0.8 per 10,000 donors (0.008%) risk of infection with transmissible HCV.

[47] Kucirka, LM, Bowring, MG, Massie, AB, Luo, X, Nicholas, LH, Segev, DL, "Landscape of Deceased Donors Labeled Increased Risk for Disease Transmission Under New Guidelines. "*American Journal of Transplantation* 15, no. 12 (2015): 3215-3223.

[48] Kucirka, LM, Sarathy, H, Govindan, P, Wolf, JH, Ellison, TA, Hart, LJ, et al, "Risk of Window Period Hepatitis-C Infection in High Infectious Risk Donors: Systematic Review and Meta-analysis," *American Journal of Transplantation* 11, no. 6 (2011):1188-1200.

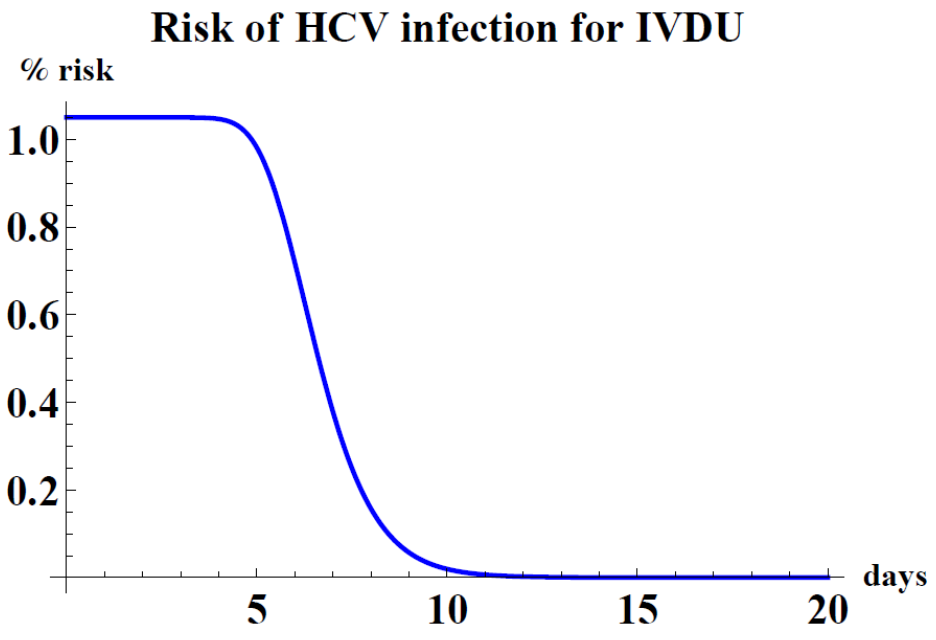
[49] Kucirka, LM, Sarathy, H, Govindan, P, Wolf, JH, Ellison, TA, Hart, LJ, et al, "Risk of Window Period HIV Infection in High Infectious Risk Donors: Systematic Review and Meta-analysis", *American Journal of Transplantation* 11, no. 6 (2011):1176-1187.

Table 3: Estimated risk of window period infection (per 10,000 donors)

Risk per 10,000 donors	HIV ELISA	HIV NAT	HCV ELISA	HCV NAT
Men who have sex with men	10.2 (0.10%)	4.2 (<0.1%)	32.5 (0.33%)	3.5 (<0.1%)
IV drug users	12.1 (0.12%)	4.9 (<0.1%)	300.6 (3%)	32.4 (0.32%)
Persons with hemophilia	0.086 (<0.01%)	0.035 (<0.01%)	0.26 (<0.1%)	0.027 (<0.01%)
Commercial sex worker	6.6 (<0.1%)	2.7 (<0.1%)	114.9 (1.2%)	12.3 (0.12%)
Sex with a partner in above categories	0.7 (<0.1%)	0.3 (<0.1%)	114.9 (1.2%)	12.3 (0.12%)
Blood product exposure	1.5 (<0.1%)	0.6 (<0.1%)	4 (<0.1%)	0.4 (<0.1%)
Incarceration	2.3 (<0.1%)	0.9 (<0.1%)	7.2 (<0.1%)	0.8 (<0.1%)

Even with the increased sensitivity offered by NAT, this testing may not, for example, detect an HCV exposure that occurred several days prior to testing. Accordingly, a donor that died with an immediate needle exposure has a risk significantly higher than NAT may reflect, possibly as high as 3% for HCV, although lower for HBV and HIV. Figure 1 illustrates the probability of undetected HCV infection after a known IVDU exposure, despite negative NAT results.

~~Figure 1: Probability of Undetected HCV Infection despite Negative Nucleic Acid Testing due to isolated IVDU Increased Risk Behavior~~[50]



~~Days Post Exposure~~

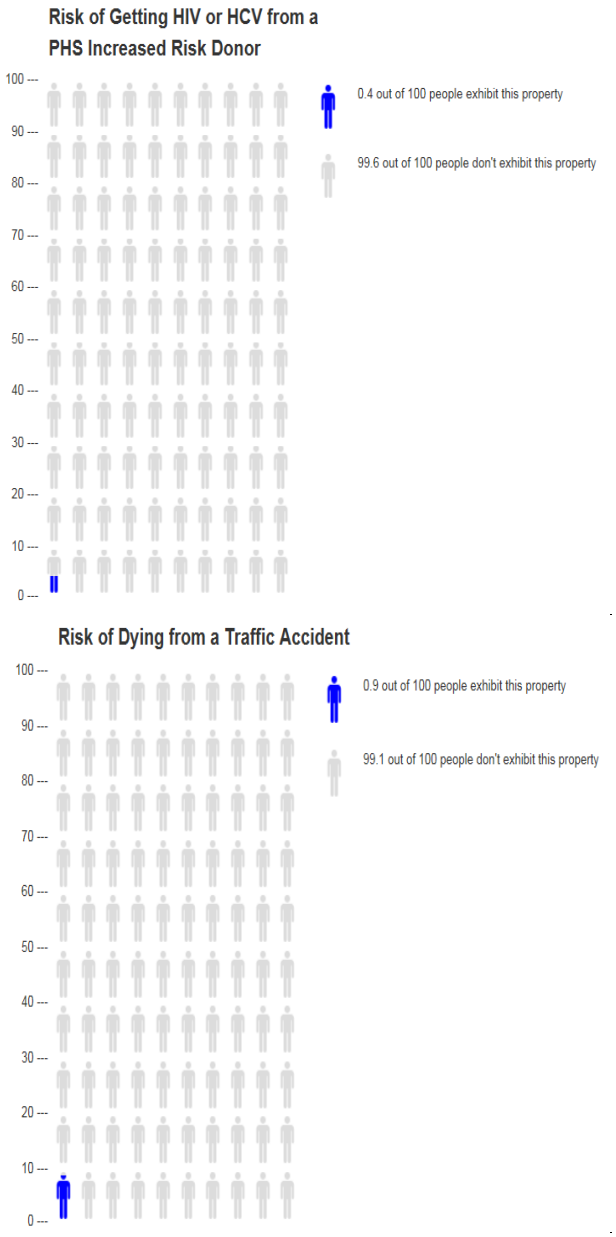
~~Disclosure of the donor's risk behavior is currently up for debate.[51] Even without disclosing the specific behavior of the donor that results in the increased risk designation, the actual comparative risk associated with that behavior should be communicated by the transplant team when informing a transplant candidate about the various risks associated with accepting an offered organ to optimize recipient's informed consent.~~

~~Risk can also be explained to patients relating to everyday concepts, as well as by using resources available. Figure 2 below, as well as a link to the National Safety Council provided in the footnotes, outlines the lifetime risk of death in a traffic accident. This information can help laypersons understand the relative risk of undetected disease transmission.~~

~~[50] Annambholta PD, Gurbaxani BM, Kuehnert MJ, Basavaraju SV, "A Model to Estimate the Probability of Human Immunodeficiency Virus and Hepatitis C Infection Despite Negative Nucleic Acid Testing Among Increased-risk Organ Donors," Transplant Infectious Disease, (2017), doi: 10.1111/tid.12676. Amended with permission from the author.~~

~~[51] Gordon, EJ, Beauvais, N, Theodoropoulos, N, Hanneman, J, McNatt, G, Penrod, P, Jensen, S, Franklin, J, Sherman, L, Ison, MG. "The Challenge of Informed Consent for Increased Risk Living Donation and Transplantation," *American Journal of Transplantation* 11, no. 12 (2011):2569-2574.~~

Figure 2: Risk of getting HIV or HCV from a "PHS increased risk" organ versus lifetime risk of dying from a traffic accident[52],[53],[54]



[52] Kucirka, LM, et al, Risk of Window Period HIV Infection in High Infectious Risk Donors: Systematic Review and Meta-Analysis", *American Journal of Transplantation* 11, no 6 (2011): 1176-1187. Images created by Iconarray.com. Risk Science Center and Center for Bioethics and Social Sciences in Medicine, University of Michigan. Accessed November 22, 2016.

[53] Kucirka, LM, "Risk of Window Period Hepatitis-C Infection in High Infectious Risk Donors: Systematic Review and Meta-Analysis", *American Journal of Transplantation* 11, no 6 (2011): 1188-1200. Images created by Iconarray.com. Risk Science Center and Center for Bioethics and Social Sciences in Medicine, University of Michigan. Accessed November 22, 2016.

[54] http://www.nsc.org/learn/safety-knowledge/Pages/injury-facts-chart.aspx, Images created by Iconarray.com. Risk Science Center and Center for Bioethics and Social Sciences in Medicine, University of Michigan. Accessed November 22, 2016.

The InformMe website provides further animations and graphics to allow patients to understand the risk associated with accepting an organ from a donor bearing the PHS characteristics associated with higher risk of HIV, HBV or HCV infection.[55] Further, recipients who receive organs from donors with these characteristics should be informed that they will be monitored post-transplant for infection with HIV, HBV, and HCV.

Consequences of Transmission of HIV, Hepatitis B, and Hepatitis C

As treatments for HIV, HBV, and particularly HCV, have improved, the medical consequences of donor-derived infection have lessened. Solid organ transplantation of organs from donors who have screened negative for HIV into selected recipients living with HIV infection prior to transplant has become standard. Overall graft and recipient survival in HIV mono-infected recipients is similar to HIV negative recipients. Current treatments for HCV have demonstrated high cure rates in the post-transplant setting in those infected with HCV pre-transplant. HBV, if chronic infection develops, can be successfully suppressed. Nonetheless, the psychological consequence of donor-derived infection, particularly HIV, may have significant impact on recipient quality of life. Finally, if appropriate monitoring is not conducted after transplantation and donor-derived infection is not recognized early, significant clinical consequences may occur and treatment of the infection may be less efficacious.

Risk of Declining the Organ from a Donor with the PHS Characteristics for Increased Risk of HIV, HCV or HBV Infection and Remaining on the Waiting List

In communicating the risk of donor-derived infection from any donor, including those associated with donors bearing the behavioral risk factors identified by the PHS, it is important to consider the risks to the potential recipient of *not* accepting that organ and continuing to wait for another offer. This risk-benefit calculation should be individualized, based on organ type, underlying disease, and patient factors, such as blood type and immunologic profile. Local organ wait times also vary. For example, the Scientific Registry for Transplant Recipients (SRTR) reported that waiting list mortality rates varied by DSA from approximately two to eight deaths occurring per year for every 100 candidates on the kidney transplant waitlist in 2015.[56]

The Johns Hopkins Increased Risk Donor Tool uses model-based predictions to calculate risks based on particular recipient characteristics.[57] In one analysis of candidates on the kidney waiting list, accepting or declining an increased risk donor organ resulted in five year survival differences that varied from 6.4% to +67.3% depending on specific recipient characteristics.[58]

---

[55] Gordon EJ, Sohn MW, Chang CH, McNatt G, Vera K, Beauvais N, et al, "Effect of a Mobile Web App on Kidney Transplant Candidates' Knowledge About Increased Risk Donor Kidneys: A Randomized Controlled Trial, " *Transplantation* (2016).

[56] Hart, A, Smith, JM, Skeans MA, Gustafson SK, Stewart, DE, Cherikh, WS, Wainright, JL, Kucheryavaya, A, Woodbury, M, Snyder, JJ, Kasiske, BL, Israni, AK, "OPTN/SRTR 2015 Annual Data Report: Kidney", *American Journal of Transplantation* 17, S1 (2017): 21–116, DOI: 10.1111/ajt.14124, Rates are computed per patient-years on the waiting list. A patient on the list for only half a year contributes 0.5 patient years, for example.

[57] http://transplantmodels.com/ird/

[58] Chow, EK, Massie, AB, Muzaale, AD, Singer, AL, Kucirka, LM, Montgomery, RA, et al, "Identifying Appropriate Recipients for CDC Infectious Risk Donor Kidneys", *American Journal of Transplantation* 13, no. 5 (2013):1227-1234.

The risks of continuing to wait are likely even greater for liver or heart candidates.[59] Given the recent availability of highly effective HCV treatments, older estimates may overestimate mortality associated with HCV transmission. The InformMe website (https://informme.cbits.northwestern.edu) provides further context to help potential recipients weigh the risks and benefits of accepting organs from donors with increased risk behavioral characteristics, and an online calculator is available.[60]

Risk of Acquiring Hepatitis C While on Dialysis

Declining an organ bearing a risk of disease transmission will prolong time on dialysis for a patient with kidney failure, and, as hemodialysis is a risk for HBV and HCV, may paradoxically result in an increased risk of acquiring viral hepatitis. Vaccination, however, can substantially reduce the risk of HBV. No vaccine is available for HCV, and the incidence of HCV on hemodialysis is estimated to be 0.34% per year, or 1 in 3,000.[61] This risk is roughly similar to the one-time risk of acquiring HCV from an organ donor with active IVDU (the highest risk category). Therefore, in some instances, the risk of acquiring HCV can be greater by declining an organ from an increased risk donor.

Limitations to Current Screenings

Donor screening cannot detect all transmissible infections. DTAC review of reported data between 2008 and 2016 revealed 15 cases of donor-derived HCV. Four cases were likely related to human or testing error. The remaining 11 occurred as window period infections; four in the serologic window period and seven increased risk donors in a NAT window period. Intravenous drug use was identified as the cause of death in four of these 15 donors; three from 2016, and one from 2012[62]. There have been no cases of HIV transmission since the PHS Increased Risk guidelines were changed in 2013.

In addition to the limitations associated with laboratory testing, determining if a potential donor should be classified as actually having a risk behavior of interest is challenging. In the setting of deceased donation, information is typically obtained from family members or friends who may have limited knowledge of donor behaviors. Consequently, patients should be made aware that no transplant is truly risk free, yet the benefits of transplant often outweigh these risks.

Pediatric Organ Transplant Considerations

There may be unique considerations when evaluating an increased risk pediatric donor. The benefits of accepting an increased risk donor organ should be weighed against pediatric specific organ, and disease mortality and morbidity data, where possible. Though in smaller numbers as compared to adult deceased donors, OPTN data does note an increase in pediatric deceased donors that met increase risk guidelines during the period of 2005-2016.[63] During the same

[59] Freeman, RB, Cohen, JT, "Transplantation Risks and the Real World: What Does "High Risk" Really Mean?", *American Journal of Transplantation* 9 (2009): 23-30.

[60] https://informme.cbits.northwestern.edu

[61] Schweitzer, EJ, Perencevich, EN, Philosophe, B, Bartlett, ST, "Estimated Benefits of Transplantation of Kidneys from Donors at Increased Risk for HIV or Hepatitis C Infection," *American Journal of Transplantation* 7, no. 6 (2007):1515-1525.

[62] Kaul, D, Clark, M, Michaels, M, Tlusty, S, Wolfe, C, "Deceased Donors with a History of IV Drug Use and Donor Derived Hepatitis C Virus," (presentation, American Transplant Congress. Chicago, IL, April 29 - May 3, 2017).

[63] Based on OPTN data as of April 7, 2017

~~period, there was an increase in transplants performed on pediatric recipients using organs from increased risk deceased donors, up from 4.5% to 10.6%. There have been no reported transmissions involving HIV, HBV, or HCV from pediatric organ donors. Furthermore, no cases of donor-derived HIV or HCV have been identified in pediatric recipients.[64] Having said this, less is known about treatment options, particularly for HCV infected pediatric transplant recipients, should infection occur.~~

~~Conclusion~~

~~Through this guidance, transplant professionals can better understand and communicate the risk of window period infection present in PHS increased risk donors compared with the benefits of transplant to our community. This guidance will be reviewed periodically to ensure clinical relevance and currency.~~

~~[64] Green, M, Taranto, S, Covington, S, Michaels, M, Wolfe, C, Kaul, D, "Pediatrics & Donor Derived Disease Transmission: The US OPTN Experience [abstract]. *American Journal of Transplantation 15*, suppl 3 (2015).~~