

Committee Update

Continuous Distribution of Pancreata Update, Summer 2024

OPTN Pancreas Transplantation Committee

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Continuous Distribution of Pancreata Update, Summer 2024

Sponsoring Committee: Pancreas Transplantation
Public Comment Period: July 31, 2024 – September 24, 2024

Executive Summary

On September 5th, 2023, the OPTN Board of Directors (Board) approved a resolution asking the OPTN Pancreas Transplantation Committee and the OPTN Kidney Transplantation Committee to incorporate the following goal into the existing Continuous Distribution project: Decreased non-use/non-utilization of kidneys and pancreata.

This paper will provide an update to the community on the Committee’s progress of the Continuous Distribution (CD) of Pancreata project, including incorporating the Board’s resolution’s efficiency objectives, as the Committee works to balance equity and utility of pancreata. Continuous distribution will replace the current classification-based approach with a composite allocation score (CAS) based framework, which aims to holistically consider donor and candidate attributes and will be composed of multiple attributes that align with the National Organ Transplant Act (NOTA) and the OPTN Final Rule.^{1,2}

The Committee’s last update, *Efficiency and Utilization in Kidney and Pancreas Continuous Distribution Request for Feedback*, distributed for public comment in summer 2023, provided detailed discussions and recommendations under consideration related to operational components of allocation.³ Additionally, the community was provided an update on the Committee’s efforts to build a Pancreas Review Board and requested feedback on defining medical urgency among pancreas and kidney-pancreas (KP) candidates. Feedback received during public comment prompted further review and discussion of these topics to ensure that the allocation framework provides appropriate pathways for the timely placement of these organs.

¹ NOTA, 42 U.S.C. § 273 et. seq.

² 42 C.F.R. § 121.8.

³ *Efficiency and Utilization in Kidney and Pancreas Continuous Distribution Request for Feedback*, OPTN Kidney and Pancreas Transplantation Committees, July 2023.

Background and Progress So Far

Continuous distribution (CD) is a points-based framework that assigns a CAS that considers all of a candidate's characteristics relevant to allocation, in context with donor characteristics. The goal of continuous distribution is to replace the current **classification-based framework**, which draws hard boundaries between classifications in the current pancreas allocation system, with a **points-based framework**, creating a holistic CAS that considers both candidate and donor characteristics. This score would be constructed with multiple attributes that align with NOTA and the OPTN Final Rule.⁴ A more complete description can be found in **Appendix A**.

The Committee is tasked with developing a comprehensive proposal for the continuous distribution of pancreata and have updated the community and requested feedback in collaboration with the OPTN Kidney Transplantation Committee throughout project development.^{5,6,7,8,9} While the two Committees are now focusing on their respective organs, they continue to inform each other of their efforts. The Committee has been and will continue to work with the OPTN, Scientific Registry of Transplant Recipients (SRTR), and contracted researchers from the Massachusetts Institute of Technology (MIT) to develop evidence-based rating scales and weights.

In September 2023, the Board directed the Committee to consider how CD would decrease non-use and non-utilization of pancreata.¹⁰ For the purposes of this project, non-use is defined as an organ that is recovered for the purpose of transplant, but not transplanted. Non-utilization is defined as any organ that is not transplanted, regardless of whether the organ was recovered.

The Committee previously discussed efficiency and utilization in pancreas CD and considered how various operational components would transition into a CD framework as outlined in the Summer 2023 *Efficiency and Utilization in Kidney and Pancreas Continuous Distribution Request for Feedback*.¹¹ Since the Board directive, the Committee has discussed including medical urgency as an attribute of CD, and the Committee and the Kidney Transplantation Committee submitted a joint request for the Scientific Registry of Transplant Recipients (SRTR) to incorporate utilization and non-use into the simulation model. The modeling request is an effort to expand modeling capabilities to include non-use and efficiency metrics.

The Committee also discussed potentially developing a guidance document to address the challenges related to procurement and organ offer acceptance of pancreata. Additionally, in their continued efforts on CD, the Committee discussed the development of an exception pathway that would include a

⁴ 42 U.S.C. Sec. 273 et seq. and 42 C.F.R. part 121.

⁵ OPTN Kidney and Pancreas Transplantation Committees, "Efficiency and Utilization in Kidney and Pancreas Continuous Distribution Request for Feedback." July 2023 Public Comment. <https://optn.transplant.hrsa.gov/policies-bylaws/public-comment/efficiency-and-utilization-in-kidney-and-pancreas-continuous-distribution-request-for-feedback/>.

⁶ OPTN Kidney and Pancreas Transplantation Committees, "Continuous Distribution of Kidneys and Pancreata Committee Update." January 2023 Public Comment. https://optn.transplant.hrsa.gov/media/a5glt304/continuous-distribution-of-kidneys-and-pancreata-committee-update_pc-winter-2023.pdf.

⁷ OPTN Kidney and Pancreas Transplantation Committees, "Update on Continuous Distribution of Kidneys and Pancreata." August 2022. https://optn.transplant.hrsa.gov/media/ha2mpuor/continuous-distribution-of-kidneys-and-pancreata_comm-update_summer-2022.pdf.

⁸ OPTN Kidney and Pancreas Transplantation Committees, "Update on Continuous Distribution of Kidneys and Pancreata." January 2022. https://optn.transplant.hrsa.gov/media/qlhbtadp/continuous-distribution-of-kidneys-and-pancreata-request-for-feedback_winter-2022-pc.pdf.

⁹ OPTN Kidney and Pancreas Transplantation Committees, "Continuous Distribution of Kidneys and Pancreata Concept Paper." August 2021. https://optn.transplant.hrsa.gov/media/4776/continuous_distribution_of_kidneys_and-pancreata_concept_paper.pdf.

¹⁰ OPTN Board of Directors Meeting Summary. September 5, 2023.

¹¹ *Efficiency and Utilization in Kidney and Pancreas Continuous Distribution Request for Feedback*, OPTN Kidney and Pancreas Transplantation Committees, July 2023.

medical urgency attribute. The Committee identified clinical considerations and potential criteria to provide guidance for evaluation of pancreas medical urgency.

These topics are discussed in further detail in the sections below. The Committee is specifically soliciting feedback to inform and further refine the scope of the potential guidance document and are available under the considerations for the community at the end of this update. The Committee welcomes feedback on all aspects of this paper.

Mathematical Optimization and Second Modeling Request

The Committee continues to work with the SRTR and MIT to investigate modeling capabilities with respect to efficiency and utilization. Through mathematical optimization, the Committees are able to focus on a range of acceptable policy options to submit to SRTR for their second Organ Allocation Simulator (OASIM) modeling request. MIT augmented the Kidney-Pancreas Simulated Allocation Model (SAM) with machine learning to predict outcomes quickly and accurately by identifying policies (sets of attribute weights and rating scales) that achieved the Committee’s prespecified outcomes, outlined below, in near real-time. This mathematical optimization helped narrow the window of options to those with acceptable performance.

To inform MIT’s analysis and develop the second OASIM request, the Committees deliberated extensively regarding the objective of each attribute, and what objectives can be achieved by including each respective attribute. These discussions detailed the Committee’s expectations of how the CAS framework should perform once allocation transitions to continuous distribution. The Committee discussed the potential tradeoffs and interactions between the attributes to develop a series of objectives for what each attribute should accomplish, as seen in **Table 1**.

Table 1: Pancreas Allocation Objectives

Attributes	Goal	Modeling Objectives
Blood Type	Candidate Biology	Maintain KP screening and rules outlined in current policy
CPRA	Candidate Biology	Equitable access across CPRAs
Prior Living Donors	Patient Access	High priority in rare event candidate is a prior living donor
Pediatrics	Patient Access	High priority in rare event there is a pediatric candidate
Qualifying Time	Patient Access	Priority for candidates who have higher wait time
Proximity Efficiency	Placement Efficiency	Increase utilization of pancreata; minimize distance traveled for pancreas alone
Organ Registration	Placement Efficiency	Whole organs prioritized over islets Increase utilization of pancreata; Prioritize whole pancreas candidates for donor age ≤ 45 & BMI ≤ 30 , and prioritize islet candidates for donors > 45 or BMI > 30

On March 6, 2023, the Committee submitted a second OASIM request to the SRTR using the four scenarios outlined below (**Figure 1**).¹² This second round of modeling narrows the focus to test those attributes and associated rating scales and weights that would most likely be considered for the final proposal.

Figure 1: Pancreas OASIM Scenarios Submitted for second OASIM Request

Attribute	Proximity Efficiency : Qualifying Time Ratio			
	1:1	1.3:1 (v2)	1.6:1	2:1 (v1)
Proximity Efficiency	15%	22%	22%	22%
Qualifying Time	15%	17%	14%	11%
CPRA	20%	17%	18%	19%
Pediatrics	20%	17%	18%	19%
Prior Living Donor	20%	17%	18%	19%
Organ Registration	10%	10%	10%	10%

Results of the second OASIM modeling request were received in July 2023. The Committee reviewed the results as summarized in **Table 2** below.

Table 2. Summary of Results from second OASIM modeling request (Pancreas)

Attribute*	Objective	1:1	1.3:1	1.6:1	2:1
Proximity Efficiency	Increase utilization of <u>pancreata</u> by reducing distance traveled	Highest median distance	Median distance decreases		Lowest median distance
Qualifying Time (QT)	Priority for candidates with longer qualifying times	Tx rates for QT >2 years higher than current policy	Decreasing <u>tx</u> rates for QT >2 years		Tx rates by QT most <u>similar to current</u> policy
CPRA	Equitable access across CPRA group	Transplant rates for CPRA >98-99.5% and >99.5-99% were notably higher under all 4 CD scenarios compared with current policy. No substantial differences in transplant rates for CPRA <98% or 100%.			
Pediatrics	High priority for pediatric candidates	All 4 CD scenarios had higher pediatric transplant rates compared with current policy. No major differences in pediatric transplant rates between scenarios.			

¹² OPTN Pancreas Transplantation Committee Meeting Summary, March 6, 2023.

The Committee concluded that the results were in alignment with the Committee’s previously established modeling objectives (**Table 1**).¹³ The Committee discussed the impact of organ non-utilization and inquired about incorporating this factor in the modeling. At the time, non-utilization was not simulated due to the model’s inability to predict this organ non-utilization.¹⁴ After further work by the SRTR, the Committee reconvened these discussions to develop a request to determine the feasibility of incorporating efficiency and utilization in modeling.

Efficiency and Utilization in Modeling

In February 2024, the Committee submitted another request to the SRTR to update their OASIM model to incorporate utilization-related research questions.¹⁵ These questions ask the OASim to demonstrate how the proposed policies impact the following additional focus areas (along with previous metrics):

- Utilization and non-use of deceased donor pancreata, overall and by donor characteristics (age, body mass index (BMI), donation after cardiac death (DCD) status)
- Recovery rates of pancreata
- Sequence number at final acceptance
- Timing of final acceptance relative to donor recovery (pre vs post OR)
- Cold ischemic time (CIT)
- Allocation by center aggressiveness, overall and separately for kidney-pancreas (KP) vs pancreas

The SRTR will report back to the Committee on the feasibility of incorporating these research questions into the OASim, with consideration for the model’s overall accuracy with respect to individual non-use questions.¹⁶

Guidance on Pancreas Procurement and Utilization

Per the SRTR Annual Data Report published 2024, the number of pancreata recovered from deceased donors has decreased, 1,285 in 2022 down from 1,307 in 2021.^{17,18} There has also been a decrease in pancreata transplanted in the United States, from 963 in 2021 to 918 in 2022.¹⁹ Coupled with an increase in listings of Type 2 diabetes candidates, there has been an increase in candidate waiting time on the transplant list.²⁰ To address these concerns as well as pancreas utilization, the Committee brainstormed efficiency themes relevant to continuous distribution during their in-person meeting on March 8th, 2024. The Committee identified interrelated themes relevant to pancreas procurement and utilization: improve offer acceptance rate; optimize organ use; and enhance OPTN efficiency.²¹ The Committee as well as members of the community have expressed a desire to examine this further and improve efficiency within pancreas transplantation.

¹³ OPTN Pancreas Transplantation Committee Meeting Summary, July 17, 2023.

¹⁴ Ibid.

¹⁵ OPTN Kidney Transplantation Committee Meeting Summary, February 21, 2024. <https://optn.transplant.hrsa.gov/media/nsxayk4u/final-20240221-kidney-summary.pdf>.

¹⁶ Ibid.

¹⁷ Including simultaneous kidney-pancreas, pancreas alone, and pancreas after kidney transplants.

¹⁸ Organ Procurement and Transplantation Network (OPTN) and Scientific Registry of Transplant Recipients (SRTR). OPTN/SRTR 2022 Annual Data Report. U.S. Department of Health and Human Services, Health Resources and Services Administration; 2024.

http://srtr.transplant.hrsa.gov/annual_reports/Default.aspx.

¹⁹ Ibid.

²⁰ Ibid.

²¹ OPTN Pancreas Transplantation Committee Meeting Summary, March 8, 2024.

The Committee seeks to address several of these concerns in a guidance document. A guidance document will include best practices and guidance on procurement of pancreata, highlighting some of the themes mentioned above. While the Committee seeks to mitigate these concerns, some issues stem from program behavior.²² The list is not static and might fluctuate as the Committee continues developing the guidance document, but could include the following topics:

- Discussing the process and necessity of having expertly trained personnel available with organ procurement organization (OPO) procurement teams
 - Develop trainings in conjunction with the OPO Committee
- Re-evaluating requirements for procurement in collaboration with the Membership and Professional Standards Committee
- Increasing procurement surgeon competency and enhancing accessibility of available training for pancreas recovery and transplantation.²³
- Encouraging programs to have a separate director for Pancreas

Other discussion items related to non-utilization

The Committee discussed other aspects related to non-utilization that include the following:²⁴

- Examine and understand how broader utilization of normothermic regional perfusion (NRP) could convert more pancreas offers into viable, transplanted organs.
- Analyze barriers to utilization and determine the impact of inaccurate assessments of pancreas quality and suboptimal surgeon availability.
- Examining geographical considerations and reliance on commercial air transport schedules as key logistical factors impeding pancreas acceptance.
- Exploring a “safety net” paradigm to transplant pancreata into patients with moderately reduced renal function (eGFR 30-40 ml/min) who may require a kidney transplant in the near future.
- Engaging in active dialogue and collaborative initiatives with the American Diabetes Association to garner support and increase understanding of pancreas transplantation.
- Expanding utilization of the donor criteria at all centers through use of offer filters.
 - Incorporating donor specific factors (age, gender, body mass index [BMI]) to enable granular optimization of pancreas offer acceptance parameters.
- Examining most common refusal codes and reasons why pancreata are declined by programs.
- Examining accountability measures for programs with high non-utilization rates.

This is a broad array of topics that the Committee understands will require more narrowing in scope. The Committee asks for feedback on these topics and any additional insight into improving procurement of pancreata and increasing efficiency in pancreas transplantation.

²² Ibid.

²³ Lutz, A. J., Diwan, T. S., Hobeika, M. J., Dunn, T., Proffitt, E., Reynolds, T., & Fridell, J. A. (2023). Revitalizing pancreas transplantation: creation of a hands-on training course for pancreas allograft procurement, backbench preparation, and transplantation. *Global surgical education: journal of the Association for Surgical Education*, 2(1), 61. <https://doi.org/10.1007/s44186-023-00139-z>.

²⁴ OPTN Pancreas Transplantation Committee Meeting Summary, March 8, 2024.

Pancreas Medical Urgency

The Committee continued discussions regarding pancreas medical urgency, building upon feedback received from the *Efficiency and Utilization in Kidney and Pancreas Continuous Distribution Request for Feedback* during the summer 2023 public comment cycle. While feedback ranged in support of pancreas medical urgency, there was general consensus to include medical urgency as an attribute.²⁵ The proposed criterion of impaired awareness of hypoglycemia was supported by the community. The Committee continues to discuss community concerns, such as how to quantify medical urgency and determine appropriate weighting for medical urgency within continuous distribution. It is important to note that the Committee has not made any final decisions on the weight of this attribute. Additionally, the Committee will develop guidance on what types of clinical criteria would qualify for medical urgency and a candidate will only receive medical urgency priority if the Pancreas Review Board approves the exception request upon review.

The Committee determined that including an exception-based attribute for medical urgency in pancreas CD would provide a pathway for medically urgent candidates.²⁶ Incorporating the medical urgency attribute will also provide cases presented to the Pancreas Review Board which can then provide more information on how to define medical urgency and criteria for it based on.²⁷ Currently, there is no clinical definition of pancreas medical urgency or allocation priority for medically urgent pancreas candidates in OPTN policy.

The Committee iterated further on medical urgency criteria and solicited feedback from a variety of endocrinologic and pancreas transplantation subject matter experts to discuss robust considerations for medical urgency.²⁸ Taking that expertise into consideration, the Committee deliberated the following medical urgency criteria. Committee discussions are detailed in the following section.

Medical urgency criteria the Committee intends to move forward with:

- Impaired awareness of hypoglycemia
- Severe hypoglycemic events

Medical urgency criteria the Committee *does not plan* to include in this iteration of a medical urgency definition:

- Type I vs. Type II Diabetes
- Total duration of diabetes
- Pancreas Donor Risk Index (PDRI)
- Cardiac Autonomic Neuropathy
- Diabetes ketoacidosis (DKA)
- Pediatrics
- Accessibility to technology
- Gastroparesis
- Igl Criteria

Impaired awareness of hypoglycemia and severe hypoglycemic events

²⁵ *Briefing to the OPTN Board of Directors on Continuous Distribution of Organs*, December 4, 2023.

²⁶ OPTN Pancreas Transplantation Meeting Summary, April 17, 2023.

²⁷ *Briefing to the OPTN Board of Directors on Continuous Distribution of Organs*, December 4, 2023.

²⁸ OPTN Pancreas Transplantation Committee Meeting Summary, March 8, 2024.

Impaired awareness of hypoglycemia (IAH) is an acquired complication of diabetes where the patients' ability to recognize the onset of hypoglycemia becomes diminished or absent.²⁹ Developing IAH greatly increases the risk of severe hypoglycemia. In patients with Type 1 diabetes who use a Continuous Glucose Monitor (CGM), IAH is highly prevalent, and they are at a higher risk of severe hypoglycemia.³⁰ Because of these factors, the Committee is including both of these as criteria within medical urgency.^{31,32}

Subject matter experts and Committee members identified that although IAH is defined as the diminished ability to perceive the onset of hypoglycemia, there is anecdotal evidence in the variation of how this presents in patients. The Committee discussed extensively how to clinically define both impaired awareness and severe hypoglycemic events in consideration of including as a medical urgency criterion. The Committee and subject matter experts aligned that objective clinical parameters should be determined for the Review Board when assessing a candidate's request for medical urgency. These parameters should be documentable and with defined metrics. The Committee discussed various options, such as the following:

- Documented third-party intervention for a severe hypoglycemic event, such as medical transport to a hospital.³³
 - Due to concerns of lack of access to technology, such as a continuous glucose monitor (CGM) or similar sort of blood glucose monitoring device, having a variety of options for reporting severe hypoglycemic events ensures equitable application of medical urgency
- Demonstrated need for a glucagon injection pen or some similar form of medication.
- Data from a CGM.^{34,35}

The Committee seeks to define criteria as clearly and specifically as possible, while still ensuring that patients with the greatest need are given appropriate priority.

²⁹ Graveling, A. J., & Frier, B. M. (2010). Impaired awareness of hypoglycaemia: a review. *Diabetes & metabolism*, 36 Suppl 3, S64–S74. [https://doi.org/10.1016/S1262-3636\(10\)70470-5](https://doi.org/10.1016/S1262-3636(10)70470-5).

³⁰ Lin, Y. K., Hung, M., Sharma, A., Chan, O., Varner, M. W., Staskus, G., & Fisher, S. J. (2019). IMPAIRED AWARENESS OF HYPOGLYCEMIA CONTINUES TO BE A RISK FACTOR FOR SEVERE HYPOGLYCEMIA DESPITE THE USE OF CONTINUOUS GLUCOSE MONITORING SYSTEM IN TYPE 1 DIABETES. *Endocrine practice : official journal of the American College of Endocrinology and the American Association of Clinical Endocrinologists*, 25(6), 517–525. <https://doi.org/10.4158/EP-2018-0527>.

³¹ Ibid.

³² Lin, Y. K., Hung, M., Sharma, A., Chan, O., Varner, M. W., Staskus, G., & Fisher, S. J. (2019). IMPAIRED AWARENESS OF HYPOGLYCEMIA CONTINUES TO BE A RISK FACTOR FOR SEVERE HYPOGLYCEMIA DESPITE THE USE OF CONTINUOUS GLUCOSE MONITORING SYSTEM IN TYPE 1 DIABETES. *Endocrine practice : official journal of the American College of Endocrinology and the American Association of Clinical Endocrinologists*, 25(6), 517–525. <https://doi.org/10.4158/EP-2018-0527>

³³ Rickels, Michael R. MD; Stock, Peter G. MD, PhD; de Koning, Eelco J.P. MD, PhD; et al. Defining Outcomes for β -cell Replacement Therapy in the Treatment of Diabetes: A Consensus Report on the Iglis Criteria From the IPITA/EPITA Opinion Leaders Workshop. *Transplantation* 102(9):p 1479-1486, September 2018. | DOI: 10.1097/TP.0000000000002158.

³⁴ OPTN Pancreas Transplantation Committee Meeting Summary, December 11, 2023.

³⁵ OPTN Pancreas Transplantation Committee Meeting Summary, March 8, 2024.

Type I vs. Type II Diabetes

The Committee identified that Type 1 and Type 2 patients should be viewed equally within the continuous distribution framework. The Committee felt other factors are more relevant to medical urgency than type of diabetes alone.³⁶

Total Duration of Diabetes

While recognized as a potential factor, this was not determined to be clinically relevant to the definition of medical urgency. There are limited data available and anecdotal evidence around variation from patient to patient; therefore, the Committee elected not to include total duration of diabetes.³⁷

Pancreas Donor Risk Index (PDRI)

Since this criterion relates to donor organ quality and not candidate medical urgency, the Committee felt that inclusion as a medical urgency attribute was not relevant.³⁸

Cardiac Autonomic Neuropathy

The Committee engaged in vigorous discussion around including cardiac autonomic neuropathy (CAN) as a medical urgency attribute. It was acknowledged that CAN is common among patients and there are some data showing that it can have a five-fold increase in mortality among diabetic patients.^{39,40} However, endocrinologic subject matter experts expressed that while there are some clinical criteria, clinicians do not regularly conduct screenings.⁴¹ This lack of standardization would make CAN difficult to include as a criterion for medical urgency; however, if paired with impaired awareness of hypoglycemia, it could be included in guidelines.⁴²

Diabetic Ketoacidosis (DKA)

DKA is a complication of diabetes when the body cannot produce enough insulin. Without that insulin, the body begins to break down fat, causing buildup of acids in the bloodstream called ketones. When left untreated, this buildup causes diabetic ketoacidosis.⁴³ A variety of factors, including technology failure (CGM, insulin pump, blood glucose monitoring device), impaired awareness, and unintentional non-compliance, can lead to DKA.⁴⁴ Committee members aligned that a patient should not be penalized for a lack of awareness, as DKA can be difficult to detect in most scenarios until it is already underway. Due to its relation with IAH, the Committee is considering including DKA within guidelines for IAH, but would first need to assess and conduct further research into which parameters would qualify a patient under this criterion.

³⁶ Ibid.

³⁷ OPTN Pancreas Transplantation Committee Meeting Summary, December 11, 2023.

³⁸ Ibid.

³⁹ OPTN Pancreas Transplantation Committee Meeting Summary, March 8, 2024.

⁴⁰ Raelene E. Maser, Braxton D. Mitchell, Aaron I. Vinik, Roy Freeman; The Association Between Cardiovascular Autonomic Neuropathy and Mortality in Individuals With Diabetes: A meta-analysis. *Diabetes Care* 1 June 2003; 26 (6): 1895–1901. <https://doi.org/10.2337/diacare.26.6.1895>.

⁴¹ OPTN Pancreas Transplantation Committee Meeting Summary, March 8, 2024.

⁴² Ibid.

⁴³ Mayo Clinic. (2022). *Diabetic Ketoacidosis*. Mayo Clinic; Mayo Clinic. <https://www.mayoclinic.org/diseases-conditions/diabetic-ketoacidosis/symptoms-causes/syc-20371551>.

⁴⁴ OPTN Pancreas Transplantation Committee Meeting Summary, March 8, 2024.

Pediatrics

Pediatric priority will be a distinct attribute within the composite allocation score (CAS), so the Committee determined that it would not be necessary to include as a separate criterion under medical urgency at this time.⁴⁵

Accessibility to Technology

Discussions regarding inclusion of accessibility to technology, such as CGM, insulin pump, blood glucose monitors, have been varied.⁴⁶ Committee members acknowledged the impact that lack of access has on patients, and there was agreement that technology access barriers, should not disqualify someone from priority status. Members emphasized that criteria for medical urgency should be based on mortality risks linked to diabetes progression or other pancreatic illnesses themselves, not the societal realities that may exacerbate them.⁴⁷

Gastroparesis

After further consultation with subject matter experts, the Committee agreed to remove gastroparesis from consideration as a criterion for medical urgency as it is not typically acutely life-threatening.⁴⁸

Igls Criteria

This criterion resulted from a workshop developed to standardize definitions for β -cell graft function and outcomes.^{49,50} Though there was discussion regarding including Igls criteria, the Committee decided that because it relates to graft assessment and donor organ quality, it would not be relevant to include as a medical urgency attribute.⁵¹

During their in-person meeting March 8th, 2024, the Committee further refined this list in collaboration with several endocrinology subject matter experts. The Committee resolved to focus on impaired hypoglycemia awareness and severe hypoglycemic events as the main clinical criteria and build the review board guidelines with this in mind. It was suggested that once the Pancreas Review Board is implemented, the Committee should continue to evaluate data collected through the applications to further refine pancreas medical urgency.⁵²

⁴⁵ Ibid.

⁴⁶ American Diabetes Association provides a diabetes technology guide here: <https://diabetes.org/living-with-diabetes/treatment-care/diabetes-technology-guide#:~:text=CGMs%20do%20what%20the%20name,too%20high%20or%20too%20low>.

⁴⁷ OPTN Pancreas Transplantation Committee Meeting Summary, December 11, 2023.

⁴⁸ Ibid.

⁴⁹ Landstra, C. P., Andres, A., Chetboun, M., Conte, C., Kelly, Y., Berney, T., de Koning, E. J. P., Piemonti, L., Stock, P. G., Pattou, F., Vantyghem, M. C., Bellin, M. D., & Rickels, M. R. (2021). Examination of the Igls Criteria for Defining Functional Outcomes of β -cell Replacement Therapy: IPITA Symposium Report. *The Journal of clinical endocrinology and metabolism*, 106(10), 3049–3059. <https://doi.org/10.1210/clinem/dgab386>

⁵⁰ Rickels, Michael R. MD; Stock, Peter G. MD, PhD; de Koning, Eelco J.P. MD, PhD; et al. Defining Outcomes for β -cell Replacement Therapy in the Treatment of Diabetes: A Consensus Report on the Igls Criteria From the IPITA/EPITA Opinion Leaders Workshop. *Transplantation* 102(9):p 1479-1486, September 2018. | DOI: 10.1097/TP.0000000000002158.

⁵¹ OPTN Pancreas Transplantation Committee Meeting Summary, December 11, 2023.

⁵² OPTN Pancreas Transplantation Committee Meeting Summary, March 8, 2024.

Medical Urgency Guidance

The Committee discussed potential guidelines that the Review Board could use:

- Metrics
 - Recording use of glucagon.
 - Reporting of severe hypoglycemic events based on CGM data.
 - Committee discussed requiring a percentage of severe hypoglycemic events within a specific timeframe (further discussion will be had to solidify these parameters).⁵³
 - Incorporating the Clarke and Gold hypoglycemia survey scores.⁵⁴
- Dialysis
 - Exhausting dialysis access is already included as a medical urgency criterion for kidney, and members felt it would be consistent to include as a criterion within pancreas and kidney-pancreas.⁵⁵
 - The Committee determined that additional discussion with the Kidney Committee is warranted to affirm the inclusion of this within guidelines.
- Cardiac Autonomic Neuropathy (CAN) (surrogate within guidelines)
 - Because of its contributory factors to patient mortality, the Committee agrees that it should be included; however, further work needs to be done to develop a guideline that includes assessment of CAN.
 - Though further work needs to be done to develop guidelines for assessing CAN, it warrants inclusion as an additional element under impaired awareness of hypoglycemia
- Diabetic Ketoacidosis (DKA) (surrogate within guidelines)
 - Many cases of impaired awareness of hypoglycemia involve cases of DKA, and so inclusion as a potential criterion would ensure that instances of technology failure or involuntary non-compliance do not prevent patients from obtaining medical urgency.

The Committee's work on this will continue and criteria will be discussed further as the Committee develops and finalizes guidelines for the Pancreas Review Board. The clinical considerations are subject to change depending on continuous feedback from the Review Board and other experts in the field.

Facilitated Pancreas

Current OPTN policy permits OPOs and the OPTN Contractor to make facilitated pancreas offers if no pancreas offer has been accepted three hours before the scheduled donor organ recovery.⁵⁶ Additionally, OPOs only have access to facilitated allocation after all pancreas and KP offers to candidates registered at programs within 250 nautical miles (NM) of the donor hospital have been declined.⁵⁷ Since continuous distribution will remove hard boundaries, including the current distance-

⁵³ Ibid.

⁵⁴ Rubin, N. T., Seaquist, E. R., Eberly, L., Kumar, A., Mangia, S., Öz, G., & Moheet, A. (2022). Relationship Between Hypoglycemia Awareness Status on Clarke/Gold Methods and Counterregulatory Response to Hypoglycemia. *Journal of the Endocrine Society*, 6(9), bvac107. <https://doi.org/10.1210/endo/bvac107>.

⁵⁵ Ibid.

⁵⁶ OPTN Policy 11.6.B: Facilitated Pancreas Offers as of April 25, 2023.

⁵⁷ Ibid.

based classifications, the Committee reviewed and discussed how best to operationalize facilitated pancreas offers in the continuous distribution framework.

During the Summer 2023 public comment cycle, the Committee updated the community on their discussions and proposed changes to the current facilitated pancreas policy.⁵⁸ A comprehensive summary of those discussions is outlined in **Appendix B**. The Committee's proposed the following changes:

- OPOs and the OPTN will be permitted to make facilitated pancreas offers if no pancreas offer has been accepted five hours prior to the scheduled donor organ recovery
- Apply facilitated pancreas bypasses to candidates registered at transplant hospitals more than 250 NM from the donor hospital
- Apply bypasses to kidney-pancreas (KP) and pancreas candidates
- Bypass all candidates at non-facilitated programs, regardless of CPRA or ABDR mismatch level
- Programs qualify if they have transplanted at least 4 pancreata from donor hospitals more than 250NM from the transplant program in the previous 2 years

During Summer 2023 public comment, the proposed changes received support, but there were concerns raised. One point of opposition was that bypassing patients at non-facilitated centers could result in unequal access to donor organs, disadvantaging waitlisted patients at those centers who need a pancreas transplant. Commenters from the OPO perspective found the proposed increase in time and distance requirements for participation inadvisable. It was reasoned that extending the timeframe would further delay pancreas allocation due to the complexity of multiple organ allocation. Additionally, this change would allow OPOs to wait until the five-hour mark and only run a limited expedited list.⁵⁹ Additionally, there was concern related to the proposed changes to the qualifying criteria, suggesting that raising the transplant requirement would decrease the number of facilitated programs. Some commenters recommended further review of the current threshold of two transplants, as increasing the threshold to four could reduce the number of facilitated centers overall. Commenters reasoned that increasing the threshold to four transplants would become too restrictive. The American Society of Transplantation (AST) noted that based on the data of the current two transplants in two years threshold, 46 of 118 (39%) of programs are eligible for facilitated pancreas allocation (see **Appendix B, Figure 4**). Raising the requirement to four transplants will reduce this percentage. Commenters suggested that the Committee review the utilization of the facilitated pathway to establish the number of programs that would qualify with these proposed changes.

The Committee plans to continue discussions on the proposed policy changes and will take the results of the SRTR data request mentioned above to determine any further modifications that could enhance efficiencies within this process.

⁵⁸ *Efficiency and Utilization in Kidney and Pancreas Continuous Distribution Request for Feedback*, OPTN Kidney and Pancreas Transplantation Committees, August 2023.

⁵⁹ OPTN Pancreas Transplantation Committee Meeting Summary, October 12, 2023.

NOTA and Final Rule Analysis

The Committee submits this update under the authority of NOTA, which requires the OPTN to "establish...medical criteria for allocating organs and provide to members of the public an opportunity to comment with respect to such criteria,"⁶⁰ and the OPTN Final Rule, which states "The OPTN Board of Directors shall be responsible for developing...policies for the equitable allocation for cadaveric organs."⁶¹ The Final Rule requires that when developing policies for the equitable allocation of cadaveric organs, such policies must be developed "in accordance with §121.8," which requires that allocation policies "(1) Shall be based on sound medical judgment; (2) Shall seek to achieve the best use of donated organs; (3) Shall preserve the ability of a transplant program to decline an offer of an organ or not to use the organ for the potential recipient in accordance with §121.7(b)(4)(d) and (e); (4) Shall be specific for each organ type or combination of organ types to be transplanted into a transplant candidate; (5) Shall be designed to avoid wasting organs, to avoid futile transplants, to promote patient access to transplantation, and to promote the efficient management of organ placement;...(8) Shall not be based on the candidate's place of residence or place of listing, except to the extent required by paragraphs (a)(1)-(5) of this section."⁶² As continuous distribution seeks to consider candidate and donor characteristics holistically, each item discussed above may impact the candidate's placement on any given match run. This effort will also explore medical urgency priority for patients waiting for a pancreas. While this update will not immediately result in an allocation policy change, the concepts presented in this paper:

Are based on sound medical judgment:⁶³ The construction of the individual ratings scales and weights will be based on objective data, including simulation modeling, published research, and mathematical optimization. The Committee will rely upon peer-reviewed literature and data analyses as well as their own clinical experience and judgment in making determinations regarding assigning weights and ratings to each attribute.

Seek to achieve the best use of donated organs:⁶⁴ The Committee will need to balance how to prioritize the most medically urgent candidates against the need to optimize post-transplant outcomes, ultimately resulting in the best use of donated organs. Before the policy proposal is released for public comment, it will be modeled by the SRTR to assess its impact on waitlist mortality and post-transplant outcomes. If necessary, the Committee will adjust the rating scales or weights of the attributes to balance these outcomes.

Are specific for each organ:⁶⁵ In this case, the allocation system will be tailored to pancreata.

Are designed to avoid wasting organs:⁶⁶ The Committee identified multiple attributes specifically designed to avoid wasting organs: utilization efficiency, medical urgency, pediatrics, prior living donor, and travel efficiency. If necessary, the Committee will be able to adjust the weighting of the attributes to balance the number of transplants against other attributes.

⁶⁰ 42 U.S.C. §274(b)(2)(B).

⁶¹ 42 CFR §121.4(a).

⁶² 42 CFR §121.8(a).

⁶³ 42 CFR §121.8(a)(1).

⁶⁴ 42 CFR §121.8(a)(2).

⁶⁵ 42 CFR §121.8(a)(4).

⁶⁶ 42 CFR §121.8(a)(5).

Are designed to...promote patient access to transplantation:⁶⁷ The Committee aims to ensure similarly situated candidates have equitable opportunities to receive an organ offer through inclusion of attributes such as medical urgency. The inclusion of these attributes is likely to increase access to transplantation for these candidates.

Are designed to...promote the efficient management of organ placement:⁶⁸ The Committee is considering indicators of efficiency associated with procuring and transplanting pancreata.

Not be based on the candidate’s place of residence or place of listing, except to the extent required:⁶⁹ The Committee is considering the candidate’s place of listing to the extent that is required for the purpose of achieving efficient placement of the organs, specifically for travel efficiency, placement efficiency, and supply/demand.

Consider whether to adopt transition procedures:⁷⁰ The Final Rule also requires the OPTN to “consider whether to adopt transition procedures that would treat people on the waiting list and awaiting transplantation prior to the adoption or effective date of the revised policies no less favorably than they would have been treated under the previous policies” whenever organ allocation policies are revised. Prior to adoption of any allocation policies, the OPTN will determine whether any candidates will be treated less favorably under the future policy, and if there is a need for transition procedures for those candidates or others. This would allow members and patients time to prepare for these changes. The Committee will continue discussions on transition procedures as the project progresses.

Conclusion

This update aims to provide the community an opportunity to gain insight and better understand the work that has been done on continuous distribution since the Board charge in September 2023 to review how CD would decrease non-use and non-utilization of pancreata.⁷¹ The Committee is awaiting feedback from the SRTR to further inform this work. Additionally, the Committee is continuing work on a medical urgency exception pathway for pancreas to ensure equitable access to pancreas transplant.

In light of better understanding of how CD might impact decreasing the non-use and non-utilization of pancreata, they have held further discussions regarding efficiency in regard to procurement of pancreata. The Committee hopes to deepen understanding and commitment to efficient and effective procurement of pancreata through development of guidance for the community.

⁶⁷ 42 CFR §121.8(a)(2).

⁶⁸ 42 CFR §121.8(a)(5).

⁶⁹ 42 CFR §121.8(a)(8).

⁷⁰ 42 C.F.R. § 121.8(d).

⁷¹ OPTN Board of Directors Meeting Summary. September 5, 2023.

Considerations for the Community

The Committee encourages all interested individuals to comment on this paper in its entirety, but specifically ask for feedback on the following questions to enhance development of a guidance document as it relates to improving procurement of pancreata and overall efficiency:

- How might encouraging OPOs to have procurement teams for all abdominal organs, including pancreas, impact procurement?
- In what ways might the establishment of dedicated directors for pancreas programs influence effectiveness, outcomes, and growth of the program?
- What innovative strategies could be implemented to enhance fellowship training and cultivate greater interest in pancreas transplantation among medical professionals?

Appendix A: Background on Continuous Distribution

Continuous distribution is a points-based framework that assigns a composite allocation score (CAS) that considers all of a candidate's characteristics, in context with several donor characteristics. The goal of this project is to replace the current **classification-based framework**, which draws hard boundaries between classifications that exist in the current kidney and pancreas allocation system, with a **points-based framework**, creating a holistic CAS. This score would be constructed with multiple attributes that align with NOTA and the OPTN Final Rule.⁷²

Figure 2 shows how allocation goals combine into a composite allocation score (CAS).⁷³ Within each goal, the Committees have identified different attributes. Candidates will be assigned a certain number of points for each attribute, which will then be combined to create sub-scores that align with the different goals, which are then weighted against each other to create the overall CAS. Combining multiple sub-scores into one CAS allows holistic consideration of all factors that must be considered to satisfy the regulatory requirements for organ allocation policies.

Figure 2: Components of Composite Allocation Score (CAS)

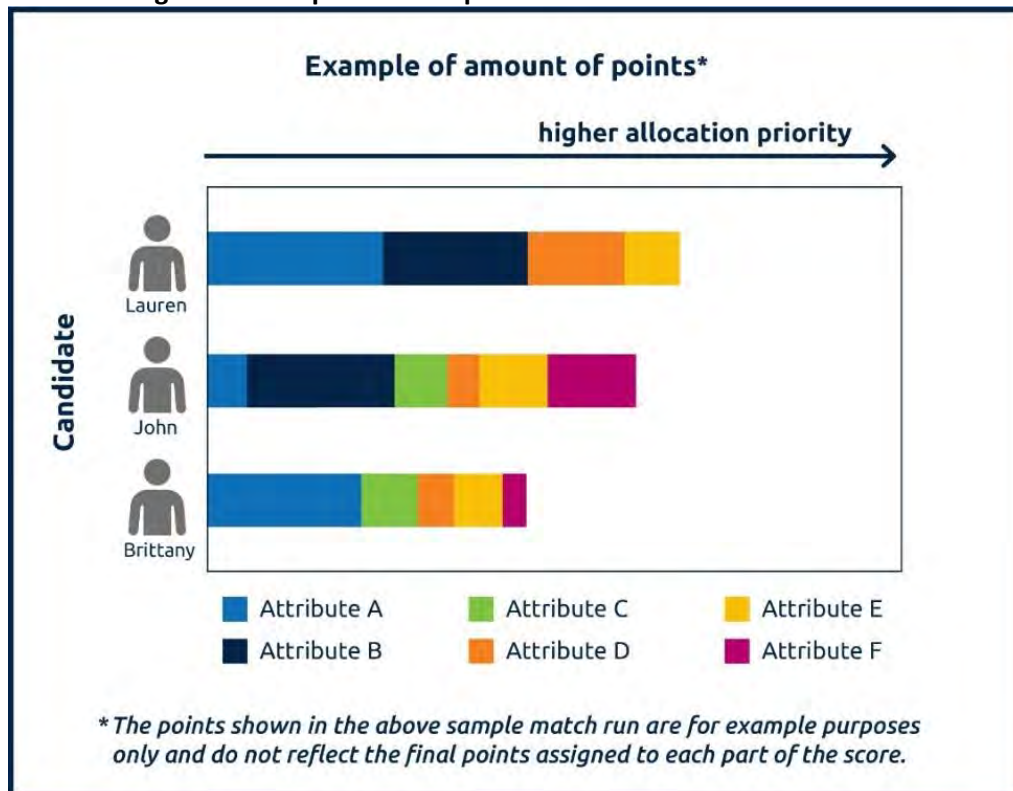


⁷² 42 U.S.C. Sec. 273 et seq. and 42 C.F.R. part 121.

⁷³ *Continuous Distribution of Kidneys and Pancreata Concept Paper*, OPTN Kidney and Pancreas Transplantation Committees, August 2021.

Figure 3 shows how potential kidney, pancreas, or kidney-pancreas (KP) composite allocation scores could function. Candidates would receive points for each of the different attributes used for prioritization. The amount of points given to each candidate would depend upon the candidate's unique situation, donor characteristics, the rating scale for that attribute, and the amount of weight given to that attribute.

Figure 3: Example of a Composite Allocation Score Match Run⁷⁴



The maximum amount of points given for any attribute is determined by the weight given to that attribute, as well as any applicable donor weight modifiers.⁷⁵ In **Figure 3**, the amount of points given to a candidate varies depending upon the candidate's specific circumstances. In comparison, the current classification-based system prioritizes all patients in a higher classification ahead of candidates in a lower classification, regardless of other considerations. A continuous distribution framework will eliminate hard boundaries between classifications existing in the current system. Candidates will receive points for various attributes and all of these attributes can be considered together as part of a CAS. A candidate's CAS, based on both candidate and donor characteristics, will determine their priority on each match run.

⁷⁴ Note each color represents a different attribute and the length of the bar shows the points credited to that attribute. Note that candidates receive points for multiple considerations and can move up or down depending on each attribute.

⁷⁵ For more information on potential composite allocation score attributes, weights, and donor modifiers, refer to *Continuous Distribution of Kidneys and Pancreata Committee Update*, OPTN Kidney and Pancreas Transplantation Committees, August 2022.

Appendix B: Facilitated Pancreas Discussions and Recommendations

With the removal of the distance-based classifications, the Pancreas Committee discussed permitting OPOs to apply facilitated pancreas bypasses from any point on the match run as long as no pancreas offer has been accepted within the timeframe specified in policy. Additionally, while facilitated pancreas bypasses currently only apply to pancreas candidates (meaning KP candidates are not bypassed when facilitated pancreas allocation is used), there was discussion regarding applying bypasses to both pancreas and KP candidates in the new framework to improve efficiency.⁷⁶

After much discussion and consideration of the established goal of increasing utilization of pancreata, the Pancreas Committee recommends applying bypasses to kidney-pancreas (KP) *and* pancreas candidates for facilitated allocation.⁷⁷

The Pancreas Committee also discussed which candidates should not be bypassed based on sensitization and level of mismatch during facilitated allocation. Currently, the facilitated pancreas tool does not bypass any candidates with CPRA 80 percent or greater or candidates who are a 0-ABDR mismatch with the donor, regardless of their program's status as a facilitated pancreas program. The facilitated pancreas tool does bypass all other isolated pancreas candidates at non-facilitated programs more than 250 nautical miles away from the donor hospital. The Committee previously expressed interest in the highly sensitized candidates having some type of priority and not being bypassed.

The Pancreas Committee deliberated on four options as follows:

- Do not bypass candidates who are both highly sensitized (CPRA greater than or equal to 80 percent) and a 0-ABDR mismatch with the donor (current policy)
- Do not bypass candidates who are highly sensitized (CPRA greater than or equal to 80 percent), regardless of 0-ABDR mismatch
- Bypass all candidates at non-facilitated programs, regardless of CPRA or 0-ABDR mismatch
- Do not bypass 0-ABDR mismatch at non-facilitated programs

In review of the options presented, the Committee discussed the data presented in the *Removal of DSA and Region from Pancreas Allocation: 1 Year Report*, that showed the following:⁷⁸

- ~7% of KP and pancreas registrations added in the year post-policy were for highly sensitized candidates (CPRA \geq 80%). Most candidates are not sensitized (CPRA 0%).
- Very few KP or PA transplants are 0-ABDR mismatch (<5/year)

In noting that there was not a big impact on highly sensitized and 0-ABDR mismatch candidates, the Pancreas Committee recommend bypassing all candidates at non-facilitated programs more than 250 NM away from the donor, regardless of CPRA or ABDR mismatch level, in support of the established goal of increasing pancreas utilization.⁷⁹

There was discussion on whether to maintain the three-hour timeframe prior to scheduled organ recovery time requirement. There was some debate about whether the three-hour timeframe is enough time to coordinate an experienced recovery team feasibly. The OPO Committee was consulted for

⁷⁶ OPTN Pancreas Transplantation Committee Meeting Summary, August 1, 2022.

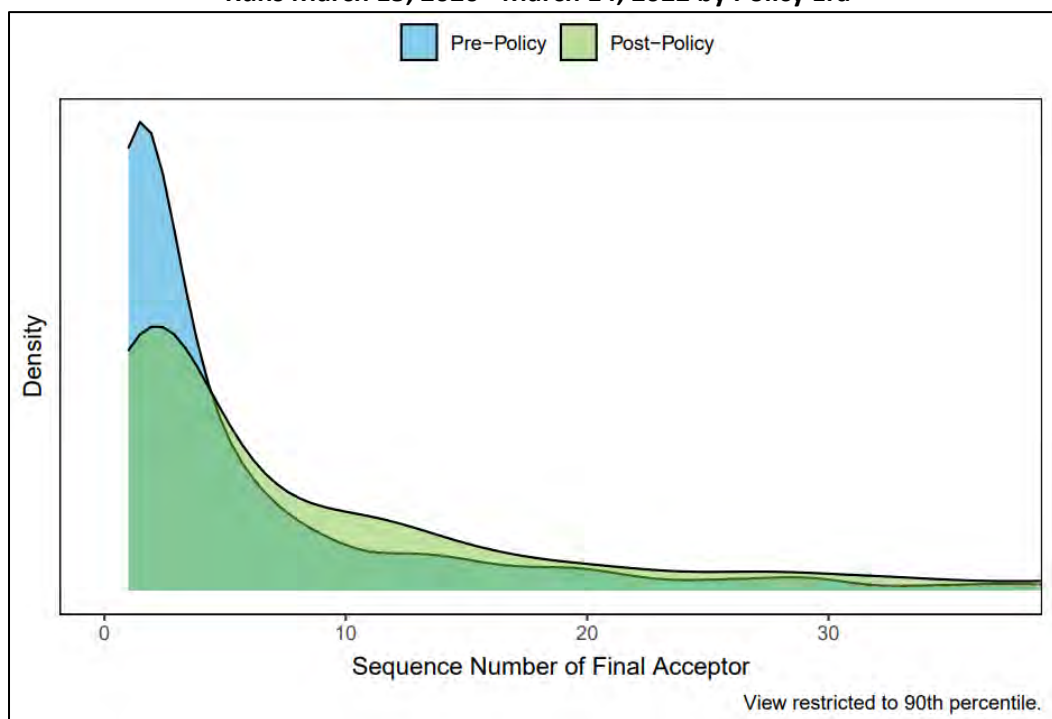
⁷⁷ OPTN Pancreas Transplantation Committee Meeting Summary, April 3, 2023.

⁷⁸ Eliminate Use of DSA and Region from Pancreas Allocation 1 Year Post-Implementation Monitoring Report. June 22, 2022.

⁷⁹ OPTN Pancreas Transplantation Committee Meeting Summary, April 3, 2023.

additional input on the use of the facilitated pancreas tool in a continuous distribution framework.⁸⁰ The OPO Committee recommended that the new policy extend the facilitated pancreas timeframe, such that facilitated pancreas bypasses may be applied four or five hours before scheduled organ recovery time, as opposed to the current three hours.⁸¹ The OPO Committee noted logistical challenges to recovering pancreata and emphasized that a longer facilitated pancreas timeframe may help coordinate remote organ recovery teams. The *Eliminate Use of DSA and Region from Pancreas Allocation 1 Year Post-Implementation Monitoring Report*, data (**Figure 4**) showed that when looking at the distribution of sequence number of final acceptor for pancreas and KP match runs, the median sequence number of the final acceptor is five and the 75th percentile is 15.⁸² This suggests that pancreata tend to be placed in the first several sequences of the match run. Although the data does not indicate timing relative to cross clamp, it also suggests that extending the timeframe would not be detrimental to non-facilitated pancreas offers.

Figure 4: Distribution of Sequence Number of Final Acceptor for Pancreas/Kidney-Pancreas Match Runs March 15, 2020 - March 14, 2022 by Policy Era



The Pancreas Committee recommended modifications to current policy that would permit OPOs and the OPTN to make facilitated pancreas offers if no pancreas offer has been accepted five hours prior to the scheduled donor organ recovery.⁸³

During earlier continuous distribution meetings, the Pancreas Committee discussed and recommended that when facilitated pancreas bypasses are applied, candidates registered at programs within 100 NM of the donor hospital would remain on the match run in addition to candidates registered at programs qualified to receive facilitated pancreas offers. Using this 100 NM distance, as opposed to the 250 NM

⁸⁰ OPTN OPO Committee Meeting Summary, May 18, 2022.

⁸¹ Ibid.

⁸² Eliminate Use of DSA and Region from Pancreas Allocation 1 Year Post-Implementation Monitoring Report. June 22, 2022.

⁸³ OPTN Pancreas Transplantation Committee Meeting Summary, April 3, 2023.

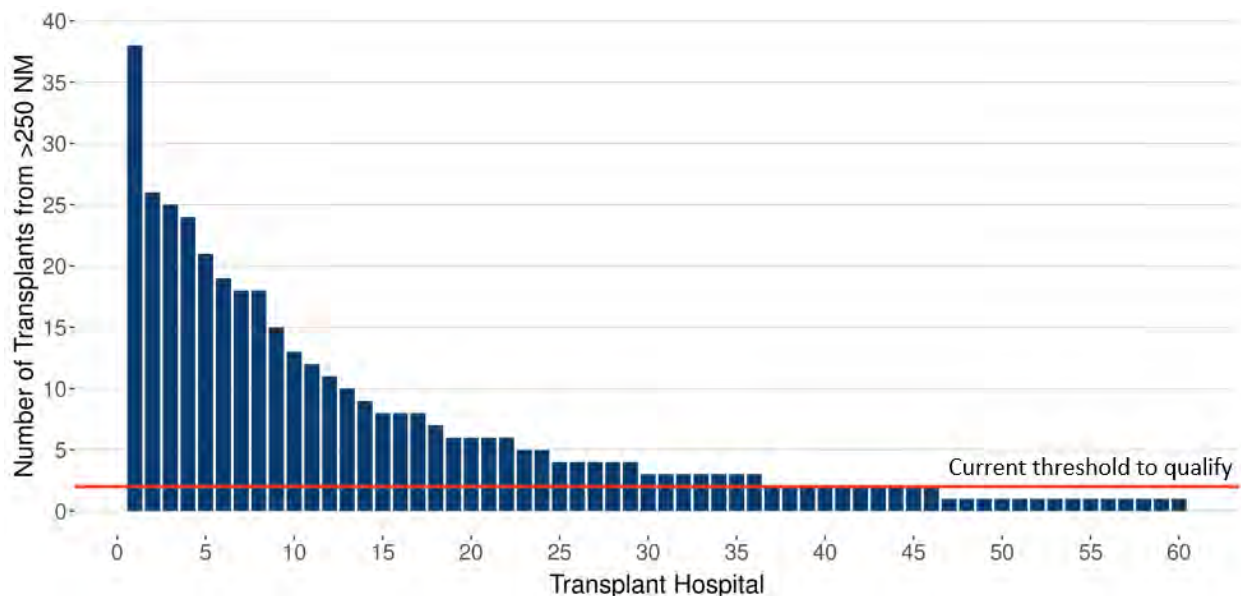
distance in current policy, was considered to improve efficiency while ensuring that candidates at nearby programs still receive offers.⁸⁴

The Utilization Considerations Workgroup reviewed the Pancreas Committee’s initial recommendations and provided additional input for consideration. The Utilization Considerations Workgroup recommended that the distance utilized in bypassing for facilitated pancreas should be the same distance utilized in the qualifying criteria for facilitated pancreas. The Workgroup recommends that if the 100 NM distance is used, this should also align with distance outlined in qualifying criteria, otherwise, there might be a challenge for transplant programs qualifying for facilitated pancreas.⁸⁵ The Utilization Considerations Workgroup cautioned that if the distance for qualifying criteria is greater than distance utilized in bypassing for facilitated pancreas, this could result in increased complexity and thus unintended challenges for a program to qualify for facilitated pancreas.⁸⁶

The Pancreas Committee agreed with the Utilization Considerations Workgroup’s recommendation to use the same distance for bypasses and for the qualifying criteria and after further discussion, decided that the current policy in this area is adequate to maintain, which would apply facilitated pancreas bypasses to candidates registered at transplant hospitals greater than 250 NM from the donor hospital.⁸⁷

The Pancreas Committee also discussed the criteria for a transplant program to qualify for facilitated pancreas. **Figure 5** demonstrates the number of pancreata transplanted from donor hospitals over 250 NM away. The red line in the figure indicates the current threshold to qualify for facilitated pancreas (at least 2 transplants from outside 250 NM in previous 2 years). A total of 118 programs transplanted a pancreas during this time period. Within this cohort, 46 programs would qualify for facilitated pancreas under current policy.

Figure 5: Number of Pancreata Transplanted from Donor Hospitals > 250 NM from Transplant Hospital July 1, 2020 – June 30, 2022



⁸⁴ OPTN Pancreas Transplantation Committee Meeting Summary, June 22, 2022.

⁸⁵ OPTN Kidney and Pancreas Continuous Distribution Utilization Considerations Workgroup Meeting Summary, September 21, 2022.

⁸⁶ OPTN Kidney-Pancreas Continuous Distribution Utilization Considerations Workgroup Meeting Summary, September 21, 2022.

⁸⁷ OPTN Pancreas Transplantation Committee Meeting Summary, April 3, 2023.

The Pancreas Committee discussed modifying the qualifying criteria by requiring programs to have transplanted 4 pancreata instead of 2 within the last two years, reasoning that this requirement change may help determine which programs are more willing to accept a facilitated pancreas offer.⁸⁸

After much discussion, the Pancreas Committee recommended increasing the transplanted criteria from two to four pancreata from donor hospitals greater than 250 NM from the transplant program in the previous two years.⁸⁹

⁸⁸ Ibid.

⁸⁹ Ibid.