OPTN Kidney & Pancreas Transplantation Committee
Continuous Distribution Workgroup
Meeting Summary
July 30, 2021
Conference Call

Rachel Forbes, MD, Chair
Oyedolamu Olaitan, MD, Vice Chair
Martha Pavlakis, MD, Chair
Jim Kim, MD, Vice Chair

Introduction

The Kidney & Pancreas Transplantation Committee Continuous Distribution Workgroup (the Workgroup) met via Citrix GoToMeeting teleconference on 7/30/2021 to discuss the following agenda items:

1. Welcome & Review of Project Goals
2. Review and Discussion: Ideas for Incorporating Longevity Matching

The following is a summary of the Workgroup's discussions.

1. Welcome & Review of Project Goals

The Workgroup reviewed the goals of the Continuous Distribution project as well as the Workgroup's next steps, including the second phase of the project (assigning values to attributes) and the development of a concept paper summarizing the identification and categorization of attributes.

Summary of discussion:

The Workgroup had no comments or questions.

2. Review and Discussion: Ideas for Incorporating Longevity Matching

The Workgroup reviewed and discussed several options to incorporate longevity matching into a continuous distribution allocation model.

Data summary:

Mapping Estimated Post-Transplant Survival scores (EPTS) and Kidney Donor Profile Index (KDPI) to Half-Lives – matrix denoting the most severe longevity mismatches among deceased donor kidney transplants by EPTS and KDPI.

- Low KDPI kidneys to high EPTS patients – this kidney has significant life years post-transplant, but those life years may not entirely be realized by a high EPTS recipient
- High KDPI kidneys to low EPTS patients – there is a high risk of early graft failure for younger, healthier patients with low EPTS

Previous and current kidney allocation systems focused on matching top 20 percent KDPI kidneys to top 20 percent EPTS patients. In this "top 20 to top 20" system, EPTS 20 or less patients are ranked higher on low KDPI match runs (KDPI 20 or less). However, this creates a boundary where EPTS 21 percent patients are treated significantly different than EPTS 19 percent patients. Similarly, KDPI 21 percent

kidneys are allocated differently from KDPI 19 percent. Longevity matching plays no role for 80 percent of kidney allocations.

Longevity Matching in Continuous Distribution: potential options

- EPTS itself could be used to prioritize patients independent of KDPI, similarly to how the lung allocation score (LAS) operates in current lung allocation
- Current top 20 to top 20 could be adopted into continuous distribution
- Longevity matching could be expanded and smoothed over hard boundaries – low EPTS candidates would receive substantial longevity matching points for low KDPI kidneys, and high EPTS candidates would receive substantial longevity matching points for higher KDPI kidneys
    - For kidneys with KDPI near 50 percent, few or no longevity matching points are awarded to candidates. Similarly, candidates with EPTS near 50 percent would receive the same total longevity points across the KDPI spectrum
    - In this model, all candidates will receive the same amount of longevity matching points on average across all donors (across a spectrum of KDPI)
    - Attribute weight would determine the importance of longevity matching

Summary of discussion:

A Workgroup Chair remarked that while the "top 20 EPTS to top 20 KDPI" was easily incorporated into current kidney allocation, highest EPTS to highest KDPI was not popular. The Chair continued that age matching in particular may not be the best option for longevity matching. One member pointed out that KDPI is not a good measure for pediatric donors, creating a longevity mismatch as KDPI often underestimates kidney function and quality in pediatric donors. High quality pediatric kidneys with high KDPIs are not typically allocated to those recipients with the highest longevity. The member continued that age matching could make more sense with pediatric donors and pediatric recipients. Another Workgroup Chair agreed, noting that pediatric candidates often miss out on good pediatric donors who have too high a KDPI. However, very small kidneys from small pediatric donors are not good for small recipients due to anatomy – attempting to connect two small vessels at a low blood pressure can be very technically difficult and risky. The Chair suggested that any age matching should have a bottom threshold, below which younger candidates could be matched by weight or another factor.

One of the Chairs remarked that top-end high KDPI kidneys to top-end high EPTS candidates should also be considered a mismatch, since that match has a high risk of failure with the compounded effects or recipient and donor risks.

A member pointed out that the estimated graft half-life figure presented were from a study based on transplanting high quality kidneys across the EPTS spectrum, and that an 8-year survival estimate for an 81-100 percent EPTS candidate is based on that candidate receiving a high quality kidney.

One member remarked that EPTS may need to be reshaped to maximize benefits of longevity matching, and asked the workgroup what major factors are being missed, even with the current "top 20 to top 20" longevity matching in current allocation. Staff provided context, explaining that the four factors making up EPTS – age, time on dialysis, prior transplant recipient, and diabetic state – were chosen by the Kidney Committee years ago, with the motivation of keeping EPTS understandable to patients and of keeping data burdens for transplant centers low. Staff noted that the Kidney Committee could choose to expand EPTS calculation. The member remarked that the major two reasons for recipient death were infection and heart disease, the latter of which could somehow be utilized to more accurately estimate post-transplant survival. The member continued that variations on how to record coronary artery disease could create bias between transplant centers. Staff added that risk stratification for recipients

and candidates based on cardiovascular disease has previously been very challenging. Another member shared that adding cardiovascular disease to EPTS has been discussed and decided against, with the reasoning that not all cardiovascular disease is the same. The member pointed out that not all diabetes is the same either, and that EPTS does not distinguish between 50 years of type 1 diabetes or one day of type 2 diabetes. The member recommended considering other factors influencing outcomes, such as surrogate markers for compliance or non-medical reasons for graft loss.

A Workgroup Chair remarked that most of the discussion has focused less on longevity matching and more on the limitations of the current EPTS and KDPI calculations, and agreed that it would be difficult to rely on these tools too heavily. The Chair continued that the estimated graft half-life scores were calculated from a huge number of transplants, but the averages themselves are useful only in a theoretical conversational bases at time of transplant, and less so in individual counseling patients. There would likely be considerable objection to longevity matching past the current "top 20 to top 20" model. The Workgroup Chair asked if the current practice requiring programs to get consent from patients to accept high KDPI kidneys would remain in a new longevity-matching model. Staff clarified that would likely be a separate conversation, and noted that centers vary greatly in high KDPI acceptance practices. Another Workgroup Chair agreed that basing longevity matching on KDPI and EPTS could create a flawed system. The Chair remarked that longevity matching works better on a spectrum and could still be understandable to patients – as a patients' EPTS increases with age, the patient will remain eligible for quality kidneys, and won't only be offered high KDPI kidneys.

The member expressed concern about the estimated graft half-life figures, which may not necessarily account for the sliding scale of interaction between KDPI and EPTS.

A member asked if EPTS and KDPI could be re-evaluated and adjusted later, once the initial continuous distribution allocation system has been implemented. Another member remarked that it will be difficult to piece out the effects of longevity matching in a completely new allocation system. Staff clarified that one of the benefits of continuous distribution is that it is much more flexible in terms of adjustments and changes, adding that building in automated tuning – such that once a system-level threshold is triggered, the weight is decreased to a certain amount – is theoretically conceivable, but could be difficult. Current Kidney-Pancreas allocation utilizes something similar when factoring in body mass index (BMI). A member agreed, noting that controlling for change across several variables will be difficult.

One member considered access to living donor kidneys, pointing data that pediatric and young adult patients have access to a wider pool of living donors, which may have been discouraged in giving priority to younger patients. The member asked the Workgroup to consider living donor access when considering equity in access.

A HRSA representative asked if any analysis had been done since the implementation of the Kidney Allocation System (KAS) in 2014 to evaluate if the top 20 to top 20 priority achieved its originally intended objectives and goals. Staff responded that some analysis had been done, but there could be room for more. Some outcomes, such as potential reduction in returns to waiting list due to graft failure, take a long time to evaluate. Top 20 to top 20 did have an impact in early distribution changes.

Upcoming Meeting

- August 20, 2021 (Teleconference)

Attendance

- **Committee Members**
  - Martha Pavlakis
  - Rachel Forbes
  - Silke Niederhaus
  - Jim Kim
  - Abigail Martin
  - Tarek Alhamad
  - Amy Evenson
  - Arpita Basu
  - Beatrice Concepcion
  - Cathi Murphey
  - Oyedolamu Olaitan
  - Parul Patel
  - Pradeep Vaitla
  - Raja Kandaswamy
  - Jodi Smith
- **HRSA Representatives**
  - Jim Bowman
  - Marilyn Levi
  - Raelene Skerda
- **SRTR Staff**
  - Ajay Israni
  - Bryn Thompson
  - Jon Miller
- **UNOS Staff**
  - Lindsay Larkin
  - Joann White
  - Rebecca Brookman
  - Alison Wilhelm
  - Amanda Robinson
  - Darren Steward
  - Ben Wolford
  - Janis Rosenberg
  - Joel Newman
  - Kaitlin Swanner
  - Kayla Temple
  - Lauren Motley
  - Leah Slife
  - Sarah Booker