Continuous Distribution:

Using big data analytics to make allocation more fair and flexible

What you need to know

- The organ donation and transplantation system in the U.S. has **never worked better than it does today.** Deceased donor transplants have increased for seven consecutive years—even through the pandemic—and 40% more organ transplants occur annually than just eight years ago.

- Every day, the community works together to **make the system even better.**

- As part of these efforts, we're leveraging big data analytics to develop a more fair and flexible approach to allocating donated organs to **get the right organ, to the right person, at the right time.** We're calling it Continuous Distribution.

- Our policies have always been data-driven, but this new approach **applies advanced analytic techniques** to create an algorithm that makes every factor in the match run comparable.

- Doing so will dissolve hard boundaries that exist in the current, category-based system and **ensure that no single factor determines a patient's priority on the waiting list.** While certain factors will have more weight than others, they will be considered together and incorporated into a composite score for each patient.

- If over time, data suggest the new system places too much emphasis on one factor and not enough on another, the weights can be increased or decreased. This means the **approach is more agile and responsive.**

- Continuous Distribution will be flexible enough to apply to all organ types. Using the same framework for all organs will **improve organ allocation by creating consistency and transparency** for the entire organ donation and transplant community.

- **Members of the community** are being encouraged to provide their input throughout the process of developing this new framework.

Organ allocation today

- The current way candidates are prioritized on the waitlist ranks them by placing them into categories, including blood type and antibody sensitization.

- These categories sometimes create hard boundaries that result in inequities for candidates on the edge of a category boundary.

- For example, the current system prioritizes patients with an identical blood type to the donor over patients that have a compatible blood type to the donor, because all things being equal, it's generally preferable to match identical blood types. However, by placing one category before another, even the most medically urgent patient with a compatible blood type would wait until less medically urgent patients with identical blood types received offers.

A better way

- In 2018, the Board of Directors approved the Continuous Distribution model for future policy development. It will eliminate edge cases like this one by dissolving hard boundaries and establishing a single allocation framework for all organs.

- The framework moves organ allocation from placing and considering patients by categories such as blood type to leveraging big data analytics and considering multiple factors all at once using an overall score that operates on a sliding scale.

- The composite score for each patient includes all factors—medical urgency, outcomes, candidate biology and efficiency of organ transport.

- In the example above, this means that in the Continuous Distribution framework, an identical blood type patient could receive more points for being an identical blood type match, but a compatible blood type patient could receive more points for having a greater medical need.

- The new framework ensures no single factor determines priority for donated organs.

How it works

- Certain factors will have more weight than others, giving them greater influence on the total score. For example, waitlist mortality may have more weight for hearts while waiting time may have more weight for kidneys.

- The framework is designed to be easily "tunable." If data suggests too much emphasis is being placed on one factor and not enough on another, the weights can be increased or decreased for others.

- This makes the framework flexible and responsive to changes.

What happens next?

- All organ systems will transition to Continuous Distribution, but the lung community will be the first.

- A request for feedback paper was available for public comment Aug. 4 – Oct. 1. It outlined the work that has been done so far and invited the community to provide feedback that will inform next steps.

- The committee will review the feedback provided by the community and begin constructing a proposal for modeling and public comment to be issued in 2021.

- Preliminary work has begun to transition kidney and pancreas policy to the Continuous Distribution framework.

Expected outcomes

- Improved flexibility of the system to get the right organ to the right patient at the right time.

- Greater equity among potential recipients and better use of the limited supply of organs.

- Increased transparency in future policy development and consistent monitoring of the allocation process by having one organ distribution framework that applies to all organ types.

Find more details and information about Continuous Distribution on the **OPTN website.**