Commentary: The Evolving Market of Heart Transplantation

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Commentary: The Evolving Market of Heart Transplantation

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**Central Message:** DCD donors add a layer of opportunity and risk to heart transplantation. Centers who utilized these donors increase the likelihood of transplant and decrease risk of waitlist and post-transplant death.

**Central Picture Legend:** Scott C. Silvestry, MD

"To know values is to know the meaning of the market"

- Charles Dow

Hess and co-authors present their study, “DCD Improves Probability of Heart Transplantation in Candidates with Post-Transplant Outcomes Similar to Those Achieved with Brain Dead Donors” in this month’s Journal. This important study, presented in the plenary session at the 2023 AATS annual meeting, was awarded the Presidential Recognition Award. The authors investigated the impacts of donation after circulatory death (DCD) donors on waitlisted heart transplant candidates and evaluated one-year outcomes following DCD heart transplantation within the United Network for Organ Sharing (UNOS) Standard Transplant Analysis and Research database. They found the utilization of DCD heart donors to be associated with increased probabilities of transplantation and decreased probabilities of death and/or deterioration while on the waitlist for heart transplant candidates. Furthermore, one-year survival following DCD heart transplant was equivalent to those undergoing DBD heart transplant.

These data and the authors’ conclusion are noteworthy for our field. The evolving dynamics of heart transplantation are complex, and this study illuminates this transition for all to see. This study freeze-frames this remarkable moment in heart transplantation- the initial
incorporation of a complex and seemingly high-risk strategy into clinical practice because of international efforts in heart transplantation.

The current study showed an overall benefit in transplant rates and less likely waitlist death and/or deterioration with equivalent post-transplant survival. On deeper analysis the authors also demonstrate that the direct benefit of DCD acceptance on heart transplantation was not evenly distributed with significant differences in impact between blood types, center volume, and UNOS regions. After adjustment for covariates, the authors found listing for DCD offers to be associated with a 23% increase of sub hazards for transplantation with center volume directly associated with probability of transplantation with equivalent post-transplant survival. This benefit was strongest in centers registering for DCD donors for >50% of their recipients. More is better.

DCD acceptance increased the likelihood of transplant in this study, but at what cost? Survival in DCD versus DBD donors was not significantly different. Morbidity? This study showed evidence of excess morbidity in DCD transplant with increased incidence of delayed Graft Function/PGD and Renal Failure, a finding seen in other DCD heart transplant studies as well.

The benefit in likelihood of transplant is not linear across all centers and their recipients. Transplant centers that transplant efficiently through volume or DCD experience likely receive the most benefit with the addition of this secondary market. Taken together these data and trends suggest that the high-volume centers and high DCD utilizing centers may be driving an indirect benefit that is distributed to other, lower volume and lower DCD donor avid centers. These findings allude to the pivotal role of consistent center specific donor strategy in the context of donor type availability as a driving factor in heart transplantation- a factor that remains difficult
to study.

Hess and coauthors define the market characteristics for heart transplantation in 2022. With the addition of a voluntary “second market,” very early NRP adapters and those in the DPP clinical trial experienced different opportunities to receive donor organs for their patients in the data presented in this study. These dynamics are important to understand and apply the current study’s data in your clinical practice with caveats. Since many institutions involved in this study were in a clinical trial with an Organ Care System device or were adventurous centers utilizing NRP as early adapters, the donor-recipient pairings may not mirror ongoing clinical practice moving forward.

Due to limitations in the SRTR dataset with respect to DCD donation, there are significant limitations to the current analysis. Whether DCD Procurement strategy affects the probability of transplantation for waitlisted candidates cannot be determined from this analysis. Nor can outcome differences between DPP vs NRP be assessed due to the small sample sizes. Categorization is inferential, since during the study period, UNOS only recorded whether candidates were approved for DCD offers, but not the procurement method. With centers utilizing both types of procurement, teasing out the impacts of either strategy is difficult. Differential benefits for candidates registered for DCD offers after initial listing also present a conundrum with the potential to underestimate the impact of listing for DCD offers. Most importantly, due to the recipient differences, the DCD and DBD transplant recipients are unmatched. For these reasons, direct comparisons for the question we really want to ask simply are not possible yet.

This paper is an essential read for all thoracic transplant surgeons. Understanding the new dynamics is important. These dynamics will change as the market evolves. And so should
we. The current study provides insight into the opportunity that DCD donors present for patients, centers, and the community. Even if a center does not accept DCD donors at present, evolving a strategy to accept appropriate DBD donors in this altered landscape is wise, using these data to guide. Understanding the opportunity in your volume strata, patient mix, and region are essential to provide efficient heart transplantation in the current environment.

This allocation “market” will evolve rapidly just as it did with the addition of Hepatitis C Cardiac donors. Any benefit to patients and programs will change with time as well. For now, Hess and co-authors provide the essential analysis to understanding the status (early) of DCD donation, outcomes, and impact for our patients, programs, and ourselves.

References
