Conclusion: The results of our study demonstrated the feasibility of successful heart transplantations during wartime - even with marginal donor hearts. The use of marginal donor hearts can be successful in cases of timely and effective correction. Our results are encouraging, follow - up is ongoing.

(1423)

A Pilot Trial of Donor Hearts Procured via Donation After Circulatory Death vs Brain Death Donation

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Purpose: The availability of suitable donors for heart transplantation remains limited. Until recently, beating hearts from donation after brain death (DBD) donors were the only heart donors used for transplantation worldwide. Donation after circulatory death (DCD) has emerged as an effective strategy to expand the HTx donor pool. For DCD, multiple methods of procurement exist, including normothermic regional perfusion followed by cold storage (NRP) and direct procurement and perfusion (DPP) with the Organ Care System (OCS). Whether patients receiving a DCD heart for HTx using either NRP or DPP have similar outcomes to those receiving a DBD heart using standard cold storage remains underexplored. Therefore, we aim in this study to evaluate the safety and short-term outcomes of DCD donor hearts as compared to DBD donor HTx. Additionally, we aimed to assess the practical, financial, and logistical viability of using NRP vs. DPP for the procurement of DCD donor hearts.
Methods: Between August 2023 and June 2024, 40 patients were enrolled in this non-randomized, parallel, open-label trial; based on donor offers, patients were divided into those who had DBD hearts (n=30) and those who received DCD hearts (n=10) procured using NRP (n=8) or DPP (n=2).
Endpoints: Primary endpoints included 30-day Heart Graft-Related Serious Adverse Event (HGRSAE, encompassing patient and graft survival at 30-days or survival to discharge if more than 30 days, moderate or severe primary graft dysfunction, graft failure requiring re-transplantation, use of post-transplant mechanical circulatory support for > 72-hours immediately post-transplant). Secondary endpoints included length of time on the waiting list for DCD hearts, utilization rates of heart offers, donors attended, and hearts explanted in DCD donors, cost per DCD transplant, and cost-saving per DCD transplant.

Primary and secondary endpoints, including clinical and financial analysis will be presented.

(1424)

Enhanced Heart Transplant Rates and Reduced Waitlist Mortality Linked to Insurance under the New Allocation System

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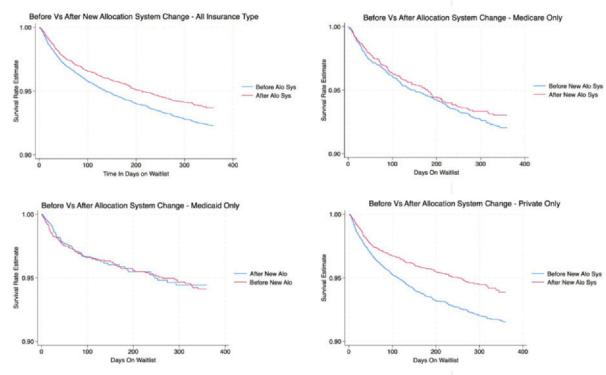
Purpose: This study aimed to assess disparities in waitlist mortality based on insurance type under the old and new U.S. Heart Transplantation Allocation systems.
Methods: We analyzed 10 years of waitlist data for adult heart transplantation candidates from the UNO database between 2013 and 2023. Candidates were classified based on their listing date: those listed before October 18, 2018, fell under the old allocation system, while those listed after this date were classified under the new system. Each classification period spanned five years: Insurance types were categorized as Private, Medicaid, and Medicare, excluding all other insurance types. We compared waitlist mortality between the two allocation systems over a one-year follow-up period.
Results: Overall, The new allocation system demonstrated a statistically significant increase in survival rate 0.9594 (0.9191-0.9997) compared to the old allocation system 0.9683 (0.9369-0.997) $p < 0.001$, when data for all insurance types is combined. However when stratifying by insurance type, the data show that significant difference in waitlist mortality is more prominent when comparing the two systems for the private insurance population $p < 0.001$. The difference in the two systems for the Medicaid and Medicare population is not that significant.
Conclusion: Our findings indicate that candidates under the new allocation system experienced significantly lower waitlist mortality, particularly among individuals with private insurance. While the overall results suggest improved resource allocation across all insurance types, the differences in waitlist mortality for the Medicaid and Medicare populations were less pronounced. These results suggest that the new allocation system may have improved equity in access to heart transplantation for privately insured candidates, highlighting the need for ongoing assessment of disparities among different insurance groups.



(1425)

Machine Learning for Predicting Offer Acceptance in Heart Transplantation

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Purpose: The current heart allocation policy, implemented on October 2018, was devised for a more granular separation of wait-listed patients based on medical urgency. Yet, many shortcomings still remain. Artificial intelligence techniques have the potential to generate better heart allocation policies and thereby improve the outcomes of heart transplantation. This study aims to develop a prediction model for heart donor acceptance, an important subroutine for policy optimization.
Methods: We leverage machine learning techniques to improve prediction for offer acceptance based on historical data in the United States supplied by the United Network for Organ Sharing (UNOS). In particular, our model is a deep neural network, a more expressive class than the baseline. It incorporates roughly double the number of features compared to the baseline (90 as opposed to 47). Further, our model contains *embedding layers* in order to extract more discriminatory power from the categorical variables.
Results: The baseline for this problem, maintained by the Scientific Registry of Transplant Recipients (SRTR), attains an area under the (macro-average ROC) curve (AUROC) of 0.832 (95% confidence interval (CI): [0.830, 0.834]). Here, we report a new model for predicting offer acceptance which yields a significantly better AUROC of 0.884 (95% CI: [0.873, 0.895]) (see Figure 1). We also conducted ablations to measure how much the performance of our model would degrade if individual aspects of the technique would be turned off. First, a network with the same capacity that uses solely the features of the SRTR baseline attained an AUROC of 0.840 (95% CI: [0.837, 0.843]). A network with the same capacity and features but without the use of an embedding attained an AUROC of 0.851 (95% CI: [0.849, 0.853]). Third, restricting the neural network to a more interpretable single layer of weights still yielded an AUROC of 0.879 (95% CI: [0.873, 0.885]).