Dual Kidney Allocation Score: A Novel Algorithm Utilizing Expanded Donor Criteria for the Allocation of Dual Kidneys in Adults

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Background
Dual kidney transplantation (DKT) of expanded criteria donors is a cost-intensive procedure to help increase the pool of available deceased organ donors. In studies today, expanded criteria single kidney (eSKT) or dual kidney transplantation (DKT) have demonstrated equivalency, but a more rigorous allocation system is needed to optimize limited resources for improved operative outcomes.

Materials and Methods
We analyzed United Network for Organ Sharing (UNOS) data for 1,547 DKT and 26,381 eSKT performed between January 1994 and September 2013. Of thirty-six donor variables known at the time of listing, thirteen were significantly associated with graft survival by multivariable cox regression modeling. From these variables, we derived a weighted multivariable product score from calculated hazard ratios to model the benefit of transplantation as dual kidneys.

Results
Differences in graft survival between dual and single transplantation were strongly correlated with our allocation score. Donors with scores less than 2.1 transplanted as dual kidneys had a worsened median survival of 594 days (24%, p-value 0.031) and donors with scores greater than 3.9 had improved median survival of 1,107 days (71%, p-value 0.002). There were 17,733 eSKT (67%) and 1,051 DKT (67%) with scores in between these values and no differences in survival (p-value 0.676 and 0.185).

Conclusions
Our analysis shows that current allocation does not optimize the benefit of dual transplantation and we provide a new outcomes-based risk score to standardize organ allocation for dual kidney transplantation.

Acknowledgements and References
We would like to acknowledge UNOS for permitting the use and sharing of their data and the Department of Surgery at Thomas Jefferson University Hospital for funding the completion of this work. We would also like to thank all the donors and their families for the wonderful gifts of life they provide for the transplant community, without which none of this would be possible.


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