

The 2008 Annual Report of the OPTN and SRTR

Survival Benefit-Based Deceased-Donor Liver Allocation

Overview

- To maximize lifetime gained through liver transplantation, post-transplant survival should be considered in prioritizing liver waiting list candidates. We evaluate a survival benefit based system for allocating deceased-donor livers to chronic liver failure patients.
- Under the proposed system, at the time of offer, the transplant survival benefit score would be computed for each patient active on the waiting list. The proposed score is based on the difference in five-year mean lifetime (with vs without a liver transplant) and accounts for patient and donor characteristics. The rank correlation between benefit score and MELD score is 0.67.
- There is great overlap in the distribution of benefit scores across MELD categories, since waiting list mortality is significantly affected by several factors.
- Simulation results indicate that over 2,000 life-years would be saved per year, if benefit-based allocation was implemented.
- The shortage of donor livers increases the need to maximize the life-saving capacity of procured livers.
- Allocation of deceased-donor livers to chronic liver failure patients would be improved by prioritizing patients by transplant survival benefit.

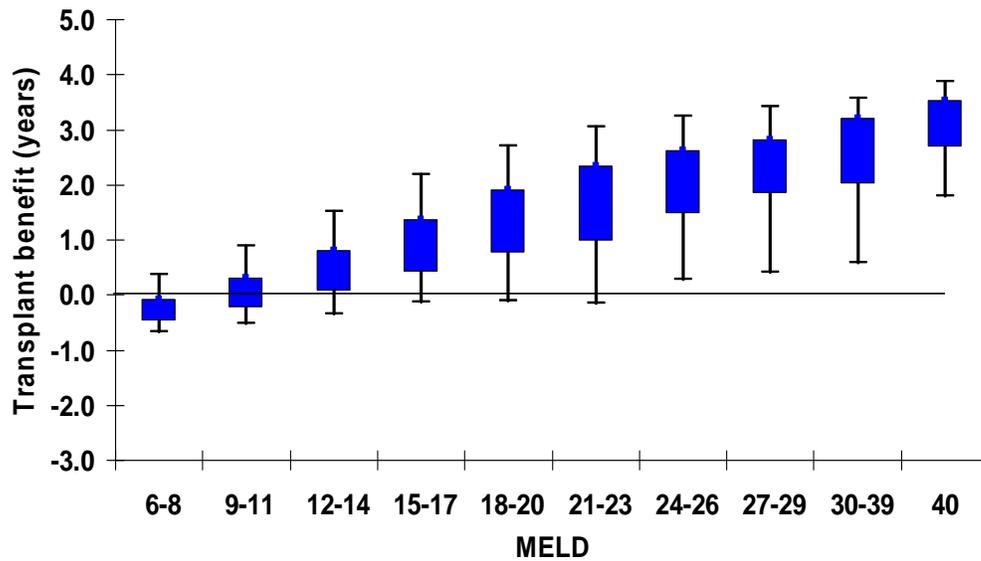
Chapter VIII of the Annual Report summarizes a survival benefit-based liver allocation system. This benefit-based design seeks to minimize mortality to the patient population as a whole by prioritizing patients based on their lifetime gained due to transplantation. The Introduction explains the concept of survival benefit-based allocation. In Measuring Transplant Survival Benefit, we discuss the quantification of transplant survival benefit and describe the currently proposed benefit score. The post-transplant and waiting list survival models are discussed in Post-Transplant Survival Model and Waiting List Survival Model, respectively. We evaluate the proposed transplant benefit score in Analysis Of Proposed Liver Transplant Survival Benefit Score, including comparisons to the MELD and various other scores. We evaluate the implications of benefit based allocation through micro-simulation in Evaluation of Benefit-Based Allocation Via Simulation. A Discussion concludes the chapter.

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The data and analyses reported in the 2008 Annual Report of the U.S. Organ Procurement and Transplantation Network and the Scientific Registry of Transplant Recipients have been supplied by the United Network for Organ Sharing and the Arbor Research Collaborative for Health under contract with the Department of Health and Human Services. The authors alone are responsible for reporting and interpreting these data; the views expressed herein are those of the authors and not necessarily those of the U.S. Government.

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Transplant Benefit by MELD Box Plots



In addition to Model for End-stage Liver Disease (MELD) score, many factors predict mortality among chronic liver failure patients. This is evidenced by the box-and-whisker plot of the proposed liver transplant survival benefit score, computed as the difference between predicted post-transplant and waiting list lifetimes, truncated at 5 years. For each MELD category, the boxes and whiskers contain the middle 50% and 90% of the data, respectively. The overlap in benefit scores across MELD categories indicates that the rankings of patients wait-listed for liver transplantation would differ greatly under a survival benefit-based allocation system.