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Northern California Chapter

870 Market Street, Suite 1048, San Francisco, CA 94102  
tel: 415-248-1060 | fax: 415-248-1066  
✉ northernca@liverfoundation.org  
www.liverfoundation.org

National HelpLine 1-800-GO-LIVER (1-800-465-4837)

## **American Liver Foundation Research Award: Improving the Allocation of a Scarce but Lifesaving Resource — The Donor Liver**

by Scott W. Biggins, MD, MAS

Donor livers for liver transplantation are a lifesaving but scarce resource. For patients whose lives depend upon a liver transplant, policies for prioritizing allocation of available donor livers are of ultimate importance. In the current paradigm for prioritizing patients on the liver transplant waiting list, available donor livers are allocated based upon a “sickest first” policy. Thus, the onus is on the transplant community to continuously refine the allocation system such that donor livers are assigned to patients who need them the most. In accordance with a mandate from the Department of Health and Human Services, donor livers in the U.S. are allocated in an objective and transparent manner using a mathematical equation called the MELD (Model for End-stage Liver Disease) score.

This MELD score-based allocation system works well, accurately predicting urgency of liver transplantation for the vast majority (83-87%) of patients waiting for a donor liver. However, there are some patients whose survival is dependent upon factors other than the severity of the liver disease, and who may not manifest derangements in the three laboratory tests that are used to calculate their MELD score. Such patients may be underserved by current MELD-based policies. My research efforts focus on improving the systems by which available donor livers are distributed to patients in need of a liver transplant.

Although significant medical and surgical advances have been made in the last two decades, many patients who undergo a liver transplant will eventually develop recurrent liver disease and failure of their transplanted liver. When this occurs, repeat liver transplantation is often the only definitive treatment. At present, liver grafts are allocated for repeat transplantation using the identical system as for initial transplantation — that is, the MELD score.

Unfortunately, the MELD score has been shown to be less accurate in measuring the urgency for repeated liver transplantation. As a result, many patients seeking a repeat transplant become too sick to undergo the procedure and must be removed from the waiting list. This phenomenon seems to be particularly true for patients who have recurrent hepatitis C infection after liver transplantation. The number of patients with hepatitis C infection in need of repeat transplantation is expected to increase four-fold in the coming decade. As a result, improved allocation policies for repeat liver transplants, particularly for those with hepatitis C infection, are essential. My research, generously funded by the American Liver Foundation, has identified new mathematical models that may improve the prediction of urgency for repeat liver transplantation and thereby optimize the overall survival benefit of the procedure.

*Dr. Biggins is a transplant hepatologist and Assistant Professor of Medicine at the University of California, San Francisco. He received a \$125,000 Jan Albrecht Award from the American Liver Foundation in 2005.*