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Editorial

PELD: Working Well, But Only Half of the Time?

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The implementation of MELD and PELD represented an enormous advance toward allocation of deceased donor livers according to objective criteria that reflect illness severity. PELD, developed using the Studies of Pediatric Liver Transplantation database, formed the basis of liver allocation for children (<18 years) (1). To acknowledge that a mathematical model cannot adequately reflect every individual's need for transplant, the allocation policy retained Status 1 designation for both acute and chronic liver disease and established a mechanism to assign increased priority above the objectively calculated score. This process entails peer review by a regional review board (RRB). The RRB decides, based upon the request of the transplant physician, the merits of the case and the local dynamics of transplant access, whether to grant Status 1 designation or to assign an increased PELD score. Explicit in the development of these new policies was the need for frequent assessment with regard to efficacy and equity.

The article by Salvalaggio and coworkers in this issue is one example of the ongoing examination of PELD-based allocation (2). They aimed to determine whether PELD improved objectivity and standardization of access to deceased donor livers for children with chronic liver disease. Using data provided by the United Network for Organ Sharing/Organ Procurement and Transplantation Network, they studied children undergoing first deceased donor liver or liver/kidney transplantation prior to and following PELD implementation. All transplants for acute hepatic necrosis and malignancy were excluded. Their primary finding was that only half of all transplants (52%) for chronic liver disease were allocated on the basis of the calculated PELD score. While 18% of transplants occurred as nonexception Status 1, the remaining 30% of transplants occurred after invoking the exception mechanism; 11% had been upgraded to Status 1 and 18% were granted increased PELD scores. Following PELD implementation, there were parallel decreases in the percentage of transplants for both chronic liver disease as Status 1 (36–30%) and ICU patients (24–18%). Although the authors could not correct for illness severity between the two eras, one possible interpretation is that PELD increased organ access for the more ill pediatric candidates, thereby avoiding escalation of status and/or medical care. Finally, the authors found, as have others, significant regional variability in the calculated scores at transplant (excluding all Status 1 transplants) and in the frequency of using the exception mechanism to achieve transplantation (3,4).

Are there too many exceptions and too much regional variability in allocation for pediatric transplantation? Unfortunately, the current manuscript did not report or analyze the calculated score of those transplanted by the exception mechanism so that we can understand their objective disease burden. However, presumably, clinicians pursued RRB consideration because they believed that the calculated score underestimated their patient's mortality risk. It is tempting to think that our professional judgment is superior to a mathematical model in determining the need for and/or the urgency of transplantation. However, a study of exception requests for both adult and pediatric candidates suggested that the requesting physician's judgment did not improve the strong predictive value of the calculated MELD/PELD score (5).

In considering the use of the exception mechanism in the context of pediatric transplantation, we would suggest that the current practice indicates that clinicians taking care of children with chronic liver disease frequently perceive a need or urgency for transplantation, which they believe is not adequately reflected by the calculated PELD score. It is striking that, juxtaposed to the 30% exception rate, 34.4% of children are transplanted at a calculated PELD score of <10 (2). Though not examined here, regions where pediatric exceptions are common appear to be regions with higher MELD scores at transplant (3), potentially reflecting a real or perceived requirement that children need higher PELD scores to compete with adult candidates. Furthermore, evidence suggests that the transplant community's threshold to proceed with transplantation is lower for children than for adults. When the current allocation policy was implemented, it was agreed that livers would be allocated using the calculated score even though data then showed that adults faced higher mortality than children at every

numerical score. Also, children, but not adults, with chronic liver disease can achieve Status 1 if criteria are met. Perhaps these allowances speak to the belief held by many that pediatric candidates face unique risks of wait-list morbidity compared to adults. Specifically, delaying transplantation could result in the loss of the benefits that might be achieved with transplantation, such as better quality of life, improved intellectual and psychosocial development and restoration of growth potential. Do these concerns explain why exceptions are used? Growth failure is already a component in the PELD allocation, but is it properly weighted? Can we develop additional objective measures which can be integrated into an allocation system? How should we properly balance risks of morbidity versus mortality, both for a given transplant candidate and, for all of our candidates? To even attempt to begin debating these questions, we need more objective data related to the potential risks of morbidity as well as proof that (early) transplantation, with its attendant risk of mortality, indeed provides overall benefit. Recently, Merion and coworkers showed that adults with a MELD score <15 faced higher 1 year mortality risk with transplantation than remaining on the wait-list (6). Similar but less robust data exist for children. If this evidence strengthens, it will likely affect the risk-benefit analysis that, in turn, will dictate change in both allocation and practice.

Refinements in allocation are constant, including efforts to clarify criteria for Status I, provide more guidance regarding the role of RRBs, use MELD for adolescents and share livers across broader populations. Even with a perfect model, the exception mechanism will likely retain some role. For those of us in the pediatric community, the challenge remains to maximize evidence-based practices and allocation strategies which allow us to responsibly and equitably serve our patients and society.

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