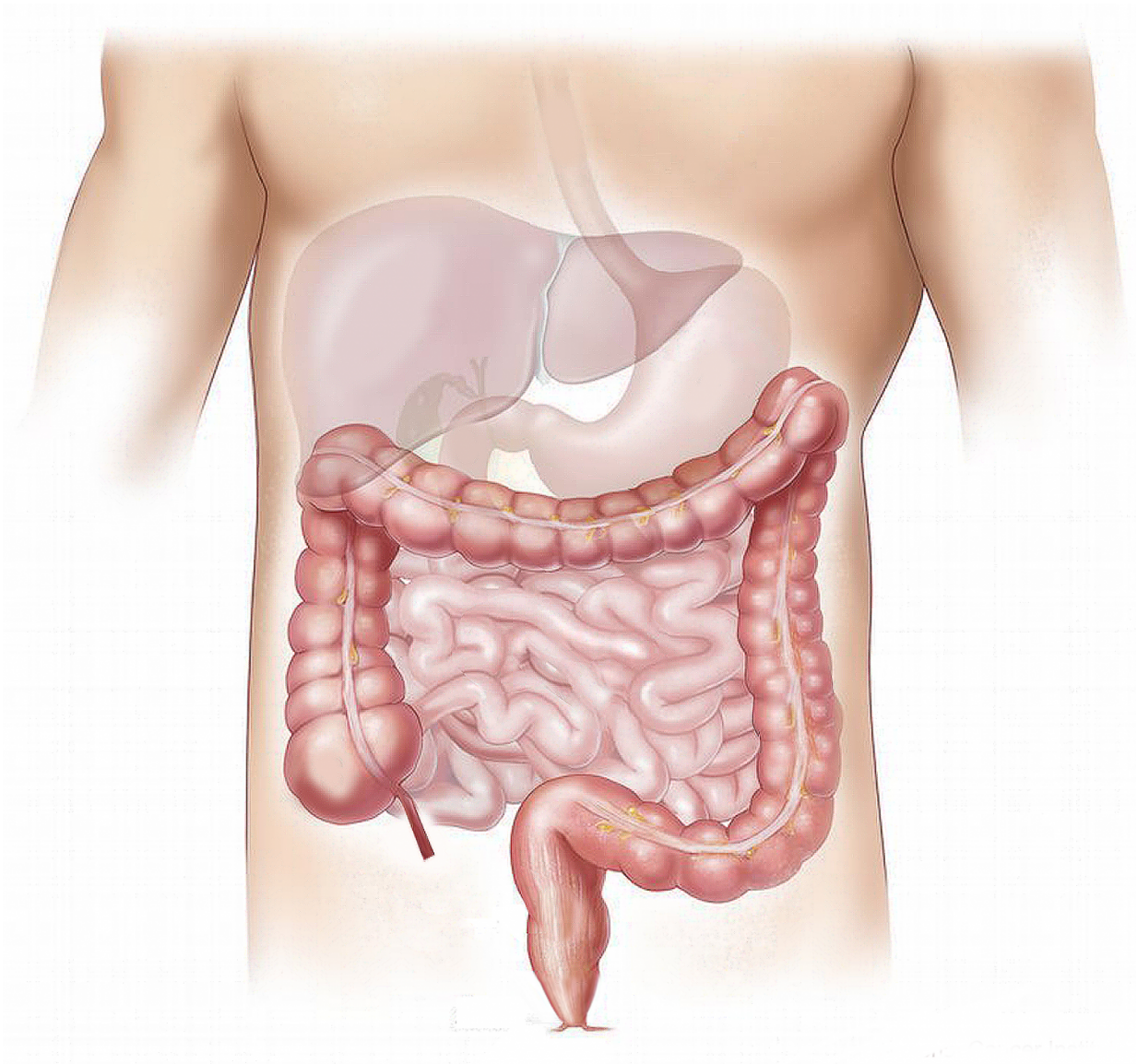


Liver allocation system disadvantages children awaiting transplants

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Children are at a considerable disadvantage when competing with adults for livers from deceased organ donors in the U.S. allocation system, a University of Pittsburgh Graduate School of Public Health-led analysis reveals today in *JAMA Pediatrics*.

When someone needs a [liver transplant](#), doctors access two separate scoring systems to place them on a national wait list, one for [children](#) under 12 years of age and one for patients over 12, to report how likely that patient is to die in the next 90 days. When a liver from a deceased adult becomes available, it is first offered to the sickest person on the list who is a match in the same geographic region as the donor liver, whether they are an adult or child. According to the Pitt analysis, the scoring system for children significantly underestimates their risk of death, when compared to the scoring system for adults.

"Anecdotally, pediatric transplant physicians have long recognized the scoring system isn't adequate when comparing children to adults," said senior author Mark S. Roberts, M.D., M.P.P., chair and professor of the Department of Health Policy and Management at Pitt Public Health. "Using national, long-term data, our report is the first to demonstrate that the scoring system, on its own, dramatically underestimates the risk of death in the next 90 days and, thereby, disadvantages children."

The Pediatric End-stage Liver Disease (PELD) score has been used to allocate livers for transplantation in children since 2002. It was developed to be an objective method to prioritize transplant candidates based on illness severity, just as the Model for End-stage Liver Disease (MELD) score does for adults. A higher score indicates that the patient's condition is worse, and that they need a transplant sooner.

Roberts and his team analyzed the records of 2,421 patients younger

than 18 years old with [chronic liver disease](#) who had been placed on the United Network for Organ Sharing (UNOS) waiting list for livers between February 2002 and March 2014. These patients did not have cancer, did not receive a partial liver from a living donor and had not been granted PELD exception points, which are awarded by UNOS when the pediatric surgeon makes a strong case that a child's PELD score does not accurately reflect the severity of their illness.

They followed the children for at least two years after placement on the transplant waiting list. During that time, 62.9 percent of the children received transplants.

The team found that not only were the children more likely to die sooner than their PELD score predicted, the difference between the observed death rate and predicted risk of death grew as the PELD score worsened. Children with the highest PELD scores had nearly 8 percent higher risk of dying within 90 days than their score predicted.

If children were only "competing" for livers with other children, then comparing PELD scores would be sufficient to prioritize allocation—like comparing apples to apples. However, the reality is that children often are competing with adults—who use the MELD score—for the same deceased donor liver. When comparing a child's severity of illness to an adult's, the PELD score wasn't compatible with the MELD score, which much more accurately predicts likelihood of death in adults.

"So, you're comparing apples to oranges, and making life and death decisions with that inaccurate and inadequate comparison," said co-author Cindy L. Bryce, Ph.D., associate professor of health policy and management at Pitt Public Health.

Robert H. Squires, M.D., a pediatric liver transplant hepatologist at

UPMC Children's Hospital of Pittsburgh and co-author of the study, said that when patients come to UPMC Children's for second opinions, there are instances in which the request for exception points are underutilized. He's concerned that some transplant centers may not be experienced in using exception points to compensate for the PELD system's inadequacy.

"It's time to address this head on," said Squires, also a professor of pediatrics in Pitt's School of Medicine. "This study confirms that PELD doesn't work in competition with MELD. The transplant community should reexamine the PELD system to establish a PELD score that correlates more reliably with 90-day mortality. The current practice of utilizing requests for exception points as the work-around to allow pediatric liver transplant recipients to be more competitive for deceased donor livers is not satisfactory."

More information: *JAMA Pediatrics*, [DOI: 10.1001/jamapediatrics.2018.2541](https://doi.org/10.1001/jamapediatrics.2018.2541)

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