Impact of multiorgan and kidney-pancreas allocation policies on pediatric kidney-alone transplant candidates in the United States

Engen RM,[1] Shepherd D,[2] Bradford MC,[3] Foutz J,[4] Bartosh SM,[1] Smith SM[5]

[1]University of Wisconsin; [2]Ann & Robert H Lurie Children's Hospital of Chicago;
[3]Seattle Children's Hospital Research Institute; [4]United Network for Organ Sharing; [5]University of Washington

UW Health American Family Children's Hospital

Department of Pediatrics
UNIVERSITY OF WISCONSIN
SCHOOL OF MEDICINE AND PUBLIC HEALTH

BACKGROUND

- United States organ allocation policies prioritize multiorgan and kidney-pancreas candidates above all other kidney-alone candidates, including children
- The effects of these allocation policies on pediatric kidney transplant candidates is unclear
- Children with kidney disease suffer deficits in growth and cognitive development in addition to the routine complications of renal failure. Ethically, children also have a claim to prioritization based on the concept of 'fair innings'

METHODS

- Retrospective cohort study using data from the Organ Procurement and Transplantation Network, 12/31/2014-3/20/2020
- Kidney-alone waitlist for all kidneys with a kidney donor profile index <35% that were allocated as part of a multiorgan or kidney-pancreas transplant
- Next-sequential candidate on the waitlist was identified.
- The next-sequential candidate was included in the study if they were a pediatric candidate (listed for transplant prior to age 18 years)
- Outcomes of interest included median additional waiting time, median time to next acceptable offer, and Kidney Donor Profile Index of the received kidney.
- Subgroup examined next-sequential candidate for kidney-pancreas transplants

Table 2. Distribution of waiting time to deceased donor transplant by organ combination, United States 2017-2019

Organ Combination	n	Median	(IQR)
Pediatric Kidney-alone	1442	190 days	(70.3-446.0)
Kidney-Pancreas	2483	150 days	(49.0-415.5)
Liver-Kidney	2143	56 days	(12.0-212.0)
Heart Kidney	609	53 days	(15.0-177.0)
Adult Kidney-Alone	41052	642 days	(159-1476)

RESULTS

Median Additional Wait Time (days)	
	Median (95% CI)
Time to transplant	118 (97-135)
Time to next offer	68 (23-139)
Blood type	
A	84 (61, 120)
AB	44 (10, 156)
B	188 (130, 337)
O	120 (89, 153)
cPRA categories	
0	101 (82, 131)
1-20	81 (37, 119)
21-80	176 (118, 208)
On dialysis	67%

Table 4. KDPI of kidneys allocated to multiorgan transplant recipients and the associated pediatric next-sequential candidates

	n or Median	% or (IQR)
KDPI of kidney allocated to MOT	10%	(5%-19%)
KDPI of kidney allocated to pediatric next-sequential candidates	15%	(8%-23%)
Pediatric next-sequential candidates who were allocated a kidney with a higher KDPI than the associated MOT	161	63%
Difference in KDPI between the kidney allocated to the pediatric next-sequential candidate and the kidney allocated to the associated MOT	10%	(5%-16%)
KDPI of kidneys allocated to 3041 pediatric kidney-alone deceased donor transplant recipients during study period	12%	(6%-21%)

CONCLUSIONS

- Current allocation policy results in longer waiting times and higher KDPI kidneys for pediatric kidney candidates
- As multiorgan transplant volume is increasing, further consideration of allocation policy is necessary to maximize equity and utility
- Potential policy changes may focus on establishing listing criteria for multiorgan candidates, increasing the efficiency of kidney-pancreas allocation, and creating medical criteria for pancreas allocation priority

ADDITIONAL KEY INFORMATION

Other Key Information

- Over 10% of all kidneys are allocated as part of a multiorgan transplant
- Pediatric candidates are only given priority for kidneys with a KDPI <35%; 90% of kidney pancreas transplants utilize a kidney with a KDPI <35%

Additional Resources

- UNOS Public Comment Proposal: Stablish Eligibility Criteria and Safety Net for Heart-Kidney and Lung-Kidney Allocation tinyurl.com/2p8tx7nf
- OPTN Ethical Principles of Pediatric Organ Allocation tinyurl.com/3yep256x
- OPTN Ethical Implications of Multi-Organ Transplants tinyurl.com/2p9ea86a

Author Contact Information

Rachel Engen rengen@wisc.edu