

# New Answers to Old Questions: Waitlist Versus Transplant Outcomes in the Coronavirus Disease 2019 Era



David Klassen<sup>1</sup>

<sup>1</sup>United Network for Organ Sharing, Richmond, Virginia, USA

*Kidney Int Rep* (2021) 6, 3–4; <https://doi.org/10.1016/j.ekir.2020.11.015>

© 2020 International Society of Nephrology. Published by Elsevier Inc. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

[See Clinical Research on Page 46](#)

The coronavirus disease 2019 (COVID-19) pandemic has dramatically affected health care systems and health outcomes around the world. Transplantation has responded with critical changes to the delivery of transplant services for patients awaiting organ transplantation as well as for the larger group of previously transplanted recipients.<sup>1–3</sup> The complex clinical nature of these patients as well as the complicated infrastructure required to successfully deliver care to these patients has made the vulnerability of transplant systems apparent to all of us who work in this field.

The pandemic also has challenged assumptions about how we care for patients with end-stage organ failure, including revisiting answers to basic questions long thought to have been resolved. More than 20 years ago, Wolfe and colleagues<sup>4</sup> published

an analysis of survival data collected from patients on kidney transplant waiting lists and patients receiving kidney transplants in the US Organ Procurement and Transplant Network. They showed that when adjusted for age, sex, race, cause of renal disease, and geographic region, survival was superior for patients receiving kidney transplants compared with patients who remained on waiting lists. This study and similar studies that followed established kidney transplantation as the treatment of choice for patients with end-stage kidney disease.

In this issue of *Kidney International Reports*, Clarke and colleagues<sup>5</sup> from the Imperial College London's Hammersmith Hospital report in their paper “Informing the risk of kidney transplantation versus remaining on the wait list in the COVID-19 era” that in the environment of the COVID-19 global pandemic, these long-held assumptions on the survival benefit of kidney transplantation and our clinical practices must be reexamined.

In their study of 299 patients on the wait list and 237 kidney transplant recipients within the first year post-transplant, they found that the overall mortality rate of these groups was actually similar during the COVID-19 pandemic. COVID-19 was more likely to be diagnosed in patients on the waiting list who received more testing. The impact on overall mortality of diagnosed severe acute respiratory syndrome coronavirus 2 infections in patients on the waiting list was, however, comparable to the impact on transplant recipients who had fewer documented infections but a substantially higher mortality rate (11.3% vs. 37.5%, respectively). After adjusting for screening bias, they reported that the risk of death was actually higher in transplant recipients (hazard ratio 3.36 [95% confidence interval 1.19–9.50]).

Issues that potentially confound the Clarke *et al.*<sup>5</sup> analysis include the retrospective nature and relatively small sample size, as well as limitations of accurate identification of true cases. Their data on mortality in kidney transplant recipients are, however, similar to those reported by others, and with respect to medical risk factors associated with mortality, and the higher proportion of patients from Black and other ethnic minorities.<sup>6,7</sup> An important question not addressed in their analysis is how a diagnosis of COVID-19 in waitlisted patients who recover will affect their transplant candidacy and outcomes going forward. The impact of lost opportunity for future transplantation is difficult to assess and should be factored into decisions on whether to remain on a waiting list or proceed with transplantation.

**Correspondence:** David Klassen, Office of the Chief Medical Officer, United Network for Organ Sharing, 700 North 4th Street, Richmond, Virginia 23219, USA. E-mail: [David.klassen@unos.org](mailto:David.klassen@unos.org)

A model of transplant mortality recently developed by Massie and colleagues<sup>8</sup> suggests that the risk-benefit ratio of transplantation versus remaining on the waitlist depends primarily on the case fatality rate for transplant recipients who acquire COVID-19. Data on this issue continue to evolve but are often reported in the range observed by Clarke *et al.*,<sup>5</sup> with particularly high mortality rates among transplant recipients contracting COVID-19 early following transplantation. It should be recognized that these data have the potential to vary on a “micro” level and may be hospital specific. This argues for the value of continual assessment of local data and resources by transplant providers to guide decision making in addition to using system-wide or national high-level guidelines. As clinical experience accumulates, reports that include data from broader populations of transplant recipients suggest rates of mortality may be lower than initially reported. Mortality rates can be expected to further change as effective therapies for COVID-19 emerge and if vaccines with long-term efficacy in transplant populations are developed.

Despite uncertainty about precise mortality rates, the paper by Clarke *et al.*<sup>5</sup> nonetheless poses important questions that must be confronted by transplant patients and providers. The decision as to whether to proceed with kidney

transplantation or recommend patients to delay transplantation until the pandemic wanes remains difficult. The data are constantly changing and require continual assessment by providers and patients. The outcomes for transplant recipients and patients on the waiting list who face these complex decisions will evolve as the pandemic continues to unfold and will be influenced by the responses of health care systems and policy makers to the many challenges posed by the pandemic.

### DISCLOSURE

The author declared no competing interests.

### ACKNOWLEDGMENTS

This work was supported by the US Department of Health and Human Services, Health Resources and Services Administration, Healthcare Systems Bureau, Division of Transplantation under contract number HSH250201900001C and conducted under the auspices of the United Network for Organ Sharing, the contractor for the Organ Procurement and Transplant Network. The views expressed are the responsibility of the author and do not necessarily reflect the official policies of, or interpretation by, the Organ Procurement and Transplant Network, Department of Health and Human Services, or Health Resources and Services Administration.

### REFERENCES

1. Ahmed O, Brockmeier D, Lee K, et al. Organ donation during the COVID-19 pandemic. *Am J Transplant.* 2020;20:3081–3088.
2. Boyarsky BJ, Werbel WA, Durand CM, et al. Early national and center-level changes to kidney transplantation in the United States during the COVID-19 epidemic. *Am J Transplant.* 2020;20:3131–3139.
3. Rodrigo E, Minambres E, Gutierrez-Banos JL, et al. Covid-19-related collapse of transplantation systems: a heterogenous recovery? *Am J Transplant.* 2020;20:3265–3266.
4. Wolfe RA, Ashby VB, Milford EL, et al. Comparison of mortality in all patients on dialysis, patients on dialysis awaiting transplantation, and recipients of a first cadaveric transplant. *N Engl J Med.* 1999;341:1725–1730.
5. Clarke C, Lucisano G, Predecki M, et al. Informing the risk of kidney transplantation versus remaining on the waitlist in the Coronavirus Disease 2019 era. *Kidney Int Rep.* 2021;6:46–55.
6. Chaudhry ZS, Williams JD, Vahia A, et al. Clinical characteristics and outcomes of COVID-19 in solid organ transplant recipients: a cohort study. *Am J Transplant.* 2020;20:3051–3060.
7. Ravan R, Callaghan CJ, Mumford L, et al. SARS-CoV-2 infection and early mortality of waitlisted and solid organ transplant recipients in England: a national cohort study. *Am J Transplant.* 2020;20:3008–3018.
8. Massie AB, Boyarsky BJ, Werbel WA, et al. Identifying scenarios of benefit or harm from kidney transplantation during the COVID-19 pandemic: a stochastic simulation and machine learning study. *Am J Transplant.* 2020;20:2997–3007.