



Rationing Scarce Resources: The Potential Impact of COVID-19 on Patients with Chronic Kidney Disease

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During the coronavirus disease 2019 (COVID-19) pandemic, the first surge of infected patients hospitalized between March and May 2020 threatened to overwhelm hospitals' capacity and existing resources.¹ Preventive measures successfully reduced the severity of the crisis but as of June 23, 2020, the United States had suffered 120,674 deaths among 2,332,755 patients with COVID-19: a case fatality rate of 5.2% based on tests positive for severe acute respiratory syndrome coronavirus 2. In the state of New York, the diagnosis of new cases decreased from a peak of 10,824 on April 9 to 644 on June 21.² At the height of the pandemic, the dramatic increase in the need for ventilators to support the respiratory needs of patients with COVID-19 led to discussions of potential rationing or sharing of this equipment. Although clinicians in several states turned to published guidelines^{3–5} which prioritized increasing the supply of ventilators rather than rationing these limited resources, serious discussions were held about how ventilator resources would be rationed if patient need exceeded available supply. Fortunately, ventilators were obtained from federal stockpiles and new manufacturers, averting a crisis requiring rationing. Nonetheless, this experience laid bare the need to consider a fair and

rational approach to rationing if ever such a crisis occurs in the COVID-19 pandemic, or other similar pandemic situations.

As supplies dwindled, hospitals and state policymakers turned to crisis-management policies—many of which were drafted in the pre-COVID-19 era—to determine how best to manage potential shortages.⁵ Numerous criteria can direct allocation of scarce life-sustaining resources including fair-chance systems (either “first come, first served” or a lottery system), and criteria based on estimates of short- and long-term survival, age, and value to others. These criteria are not mutually exclusive and may be combined to develop a priority system.⁶ For example, the state of Maryland published a set of guidelines in 2017 outlining “a multi-principled approach... that strives to save the most lives, preserve the most years, prioritize evidence-based decisions, and show compassion to non-recipients.”⁴ They used focus groups to engage the public in this discussion. More recently, Emanuel *et al.*⁷ published recommendations guiding who gets health resources during the COVID-19 pandemic: “maximizing benefits, treating equally, promoting and rewarding instrumental value and giving priority to the worst off.” During the COVID-19 pandemic, they recommend

maximizing benefits; prioritizing health workers; not allocating on a first-come, first-served basis; responsiveness to evidence; recognizing research participation; and applying the same principles to all.

These types of nuanced approaches are preferable to other proposals that categorically exempt certain populations from receiving care. For example, in 2010, the state of Alabama published its guidelines as an *Annex to ESF 8 of the State of Alabama Emergency Operations Plan*³ that “outlines a ventilator triage protocol intended for use only during a mass casualty event.” The guidelines suggest that if all efforts to obtain ventilators are exhausted, clinicians should consult a list of exclusion criteria to guide decision making. The guidance goes on to state that in the event of a mass casualty respiratory emergency, patients with end stage organ failure, including anyone on or requiring dialysis, would not receive ventilator treatment. Fortunately, in

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response to concerns raised by patient advocates, the Office of Civil Rights of the US Department of Health and Human Services resolved a compliance review after the state removed ventilator rationing guidelines that allegedly discriminated on the basis of disability and age.⁸

As clinicians in the field of nephrology, we understand all too well the challenges of triaging patients and allocating scarce resources.⁹ In 1962, as described in Shana Alexander's grim article in *Life* magazine, "They Decide Who Lives, Who Dies", lack of funding required rationing of hemodialysis and the Seattle Artificial Kidney Center charged a committee of physicians, nurses, and community and civic leaders with developing an allocation system. The committee based its decisions primarily on a subjective assessment of "social worth," an assessment of the individual's anticipated contribution to society. As applied, these criteria favored employed white men over other groups.

Recently, Gauray Jain¹⁰ wrote a letter to the editor of *Mayo Clinic Proceedings* stating "CKD/ESRD should not be a blanket exclusionary condition in the provision of critical care services, including ventilator support." We agree. To avoid the mistakes of arbitrary or social-worth criteria to decide who will live and who will die in the COVID-19 era, we urge policymakers, hospital leaders, and physicians to consider the following recommendations.

1. All published guidelines on the allocation of scarce healthcare resources state that any rationing should not occur until we exhaust all efforts to increase the availability of the limited resources and adapt existing devices to serve as many individuals as possible. Innovation is required to increase the availability of the limited resources by adapting other devices or creating new ones. The need for innovation in the present circumstance includes efforts to increase ventilator and acute dialysis capacity.
2. Although we are used to a surfeit of resources, our society needs to recognize and prepare for contingencies

if resources are not available at the time they are needed. In that case, efforts—like those undertaken in Maryland—should include public focus groups to help put medical and ethical guidance into a more universal perspective. The process must be transparent and the resulting guidance must be shared publicly. As guidelines are developed, they must refrain from excluding whole classes of individuals because of specific diagnoses.

3. Should these contingencies emerge, a more balanced approach like that proposed by White *et al.*¹¹ is warranted. The use of standardized assessment tools like Sequential Organ Failure Assessment score can provide the basis for objective decisions about allocation of scarce resources without arbitrarily excluding individuals with ESKD irrespective of age and comorbidities.¹²

Finally, when this crisis is behind us, the leaders of medicine, ethics, and public policy must come together to review lessons learned from the current situation. In addition to establishing collaborative efforts to scale up availability of critical care equipment in the face of increased demand, more equitable approaches to allocate scarce resources need to be developed. We must aim to ensure consensus to apply equitable allocation guidelines in advance of future crises.¹³ Moving forward, data collection, registries, and targeted clinical investigation are required to more precisely characterize the interaction between chronic kidney failure treated with dialysis or kidney transplant on COVID-19 severity and therapies.

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Increasing Peritoneal Dialysis Use in Response to the COVID-19 Pandemic: Will It Go Viral?

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As the novel coronavirus disease 2019 (COVID-19) global pandemic has unfolded, efforts to facilitate social distancing while minimizing person-to-person transmission of severe acute respiratory syndrome coronavirus 2 has resulted in unprecedented changes across all facets of society. The COVID-19 pandemic represents an opportunity to reevaluate and refine existing models of health care delivery to enable provision of high-quality, comprehensive care traditionally offered within health care facilities in the home. In the United States and most high-income countries, dialysis is predominantly delivered as in-center hemodialysis, although the minority of patients who undergo dialysis at home, either as home hemodialysis or peritoneal dialysis (PD), have comparable, if not better, outcomes.¹ Frequent, routine trips for dialysis treatments at health care facilities, where individuals with advanced age, a large comorbidity burden, and high rates of hospitalization are cohorted together, foster a high-risk situation for COVID-19 transmission and related morbidity and mortality. COVID-19 outbreaks across hemodialysis facilities have been described, placing patients, their families, and the health care workers who care for these patients at risk.²

The notion that individuals receiving center-based hemodialysis are at higher risk of acquiring communicable diseases is not novel, given that transmission of viral hepatitis and colonization with

drug-resistant bacteria remain major concerns across dialysis facilities. Organizing patient transport while maintaining effective infection prevention and control measures has also been a major challenge during the COVID-19 pandemic. With fewer health care facility visits and greater ability to adhere to social distancing measures, individuals receiving home-based dialysis have a clear advantage. This is reflected in the data relating to COVID-19 infection being collected prospectively by the United Kingdom Renal Registry and the Ontario Renal Network. In the United Kingdom, by April 29, 2020, 2.9% of patients on PD were reported to have contracted COVID-19 compared with 9% of patients on hemodialysis.³ Also, as of May 22, preliminary data from the Ontario Renal Network demonstrated that, in Ontario (where the overall prevalence of COVID-19 among the ESKD population was 1%), the rate of increase in COVID-19 positivity among patients on center-based hemodialysis was threefold that experienced among those receiving home dialysis. Data from the United States are still forthcoming.

Two ESKD health care reform initiatives in the United States have increased support for home-based dialysis, which may prove useful in reducing risks presented by the COVID-19 pandemic. The first, the ESKD Prospective Payment System, created a favorable reimbursement structure that has realized increasing use of home-based dialysis in the United

States. The second initiative, the recently signed Executive Order on Advancing American Kidney Health, directly set targets aimed at increasing home-based dialysis in an effort to reduce ESKD-related costs while improving care. Given the lower risk of COVID-19 exposure from home-based dialysis compared with in-center dialysis, enabling more patients to undergo dialysis at home will protect individuals from COVID-19-related morbidity and mortality and will help limit spread of infection into the community. We are now only at the start of the COVID-19 pandemic, so it is a matter of urgency to consider what resources will be required to facilitate a rapid increase in the use of home-based dialysis and what barriers must be overcome to accomplish this goal.

Studies already show a strong association between appropriate education and the proportion of patients who subsequently choose PD.⁴ The “stay-at-home” messages related to the pandemic are likely to further increase this choice. Because both COVID-19 mortality

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