At the start of the coronavirus disease 2019 (COVID-19) pandemic, we needed to quickly develop and deploy strategies to protect patients on dialysis from acquiring and spreading infection. With little information coming from the original Chinese epicenter of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection, the Centers for Disease Control and Prevention (CDC) offered guidance on the basis of experience with previous respiratory viral epidemics, which was quickly disseminated in the kidney community (1). Outpatient hemodialysis facilities are particularly challenging; patients with advanced kidney disease and associated comorbidities were likely to be more susceptible to infection and, if infected, suffer higher morbidity and mortality. In addition, social distancing is all but impossible in most hemodialysis facilities. Dialysis organizations in the United States went into action early and forcefully. They created separate facilities or shifts for patients with known SARS-CoV-2 infections or those patients under investigation for possible infection, screened all patients and staff entering facilities for signs or symptoms of infection, emphasized frequent hand hygiene, and deployed personal protective equipment including gowns, gloves, and eye protection. They emphasized the importance of surface cleaning, machine and dialysis station disinfection, and limited access to only patients and essential personnel. Early in the pandemic, the guidance from CDC was for all staff to use surgical masks or N95 masks if available and for symptomatic patients to use similar masks, but CDC did not recommend masks for asymptomatic patients. The dialysis organizations went beyond this initial CDC recommendation and mandated universal masking for all patients and staff, whether symptomatic of viral illness or not. Weeks later, when the extent of asymptomatic SARS-CoV-2 infection and spread became clear, CDC recommended universal face masks. Early evidence from some dialysis facilities suggested that spread of infections declined when these measures were adopted (2). Over several months, reports from individual centers appeared showing high mortality among SARS-CoV-2-infected patients on dialysis (3). Later in the pandemic, the severity and mortality of COVID-19 appeared to ameliorate (4), although the reason for this change is unclear. What factors are important to infection transmission and morbidity? The early months of this pandemic saw lots of educated guessing—in the absence of hard evidence, care practices were designed and deployed on the go—like the proverbial designing the aircraft as we flew it. Is there a better way?

In this issue of CJASN, Caplin et al. (5) analyze all 5824 prevalent London-based patients on hemodialysis from seven facilities agreeing to participate on March 2, 2020. After exclusion of 69 patients with ambiguous data, information from the remaining 5755 (98.8%) patients was examined from March to May 2020, at the height of the pandemic in that city. Available databases were robust enough to record COVID-19 test positivity, hospital admission, demographic and clinical data, dialysis facility characteristics, community COVID-19 cases, and deprivation indices. The authors conclude that community levels of COVID-19, with a small contribution of unit factors and masking, determine how the infection burden evolves. Patient age, diabetes, the number of patients in the dialysis unit, and facility layout were associated with the risk of disease. Masking of asymptomatic patients was associated with fewer hospital admissions, and the number of facility side rooms per dialysis station was associated with outcomes (suggesting that the capacity to isolate patients protects onward transmission). None of the other varying isolation or deisolation strategies used by different kidney centers were associated with outcomes, nor were deprivation indices. Thus, in retrospect, a major intervention that correlated with outcome was the masking of asymptomatic patients, an intervention not initially endorsed by CDC. Had this evidence been available sooner, the importance of universal masking in dialysis facilities would have been clear, and the public confusion that followed changing CDC recommendations would have been avoided. More efficient universal real-time observations, data collection, and analysis can reduce infection transmission and improve other clinical practices.

Although the evidence in this London-based study showed no definitive relationship between deprivation indices and infection or hospitalization rate, data from the United States suggest a disproportionate portion of COVID-19-related deaths among Hispanic and Black people, including patients on dialysis and transplant candidates (6,7). Owen et al. (8) propose the cause
to be decades of the effects of social determinants of health. If it is true that social determinants of health may have contributed to racial disparities in COVID-19 infection and outcomes, future infection control and prevention efforts must take these factors into consideration. The creation of evidence-based practice guidelines in the future will require collecting and correlating SARS-CoV-2 cases and clinical outcomes with race/ethnicity, socioeconomic, and community health status.

Patients on dialysis and patients with transplants were excluded from the trials of SARS-CoV-2 vaccines that permitted Emergency Use Authorization and rapid deployment. Thus, although the vaccines were shown to be safe and effective for the general population, there was no information to guide vaccine use for patients on dialysis or with transplants and their often-suppressed immune systems. How could postmarketing evidence be used to assess and compare safety and efficacy of these vaccines in this vulnerable population? The classic approach to develop evidence-based guidelines is ill suited to deploy in a rapidly evolving crisis, such as a viral pandemic. Using that approach, developers perform a systematic review of published reports, evaluate and rate the evidence, and often utilize technical expert panels to interpret these findings. Guidelines are drawn, and then, they often are evaluated for endorsement by organizations, such as the National Quality Forum, using rigorous criteria and additional expert panels. This process often takes years to complete. In the face of a pandemic, evidence-based guidance for care requires a different pathway. Data must be collected using robust tools so that rapidly evolving clinical experience can be recorded and quantified in real time, and tools must be available to easily and quickly collect, aggregate, evaluate, and report meaningful findings and recommendations. Such registries should be in place in advance of a crisis and contain sufficient data elements, including demographic, clinical, facility-specific, and social determinants of health, to answer critical questions. This data infrastructure must be designed to allow seamless electronic data input, abstraction, and aggregation. This infrastructure should be constructed and ready to use before the next crisis strikes.

In 2015, Bill Gates (9) wrote an editorial in the New England Journal of Medicine after the Ebola epidemic of the previous year. He predicted the inevitability of another pandemic in the next 20 years and called for a global response team to recognize early and respond to such global threats. In the United States, a Directorate for Global Health Security and Biodefense was established at the National Security Council in 2016. This directorate was charged with anticipating the next pandemic and preparing the country to respond. The Trump administration folded this directorate into a new one that focused on counterproliferation and biodefense (10). Thus, at the outset of the COVID-19 epidemic in 2019, there was neither a global response team nor a dedicated US office for biodefense to rapidly recognize the COVID-19 threat, mobilize resources, assemble data, and nimbly respond to the evolving threat. We must heed Bill Gates’ advice on the global and national levels.

Although we have learned that such global and national early warning systems must be in place, these organizations need data and scientific independence, free from political influence, to respond quickly and effectively. Classic structures to collect data retrospectively, analyze data, and then publish evidence-based guidance take too much time in our modern world. New systems must be poised to rapidly collect and analyze data, construct hypotheses, rapidly develop clinical protocols to test them, and rapidly share those results publicly. In nephrology, we need data registries with real-time analytic capabilities so that evidence can be obtained and analyzed early in a pandemic or other critical situations. The analysis of data in London by Caplin et al. (5) demonstrates that patients on dialysis and facilities are not isolated from their communities. Accurate interpretation of factors responsible for disease spread within facilities will require robust interoperability between these registries and other datasets focusing on community spread. Had an infrastructure been available in the United States to analyze the experience of patients on dialysis with SARS-CoV-2 early in the pandemic, similar to the analysis of Caplin et al. (5) in this issue, focused evidence-based practice to mitigate the spread of COVID-19 among patients on dialysis and staff could have been deployed months earlier than we did. Similarly, evidence to guide patients and clinicians considering the different COVID-19 vaccines could be developed more quickly. We need a twenty-first century plan to develop and deploy evidence-based practices.

Disclosures

R. Garrick reports employment with Advanced Physician Services (Hawthorne, NY). She reports serving as Medical Director of Dialysis Clinic Inc. (Hawthorne, NY); a Board of Trustee member of Westchester Healthcare Corporation (Board of Directors at Westchester Medical Center); a Board of Trustee member of Charity Health Care System (Rockland, NY); and a member of the Renal Standing Committee of the National Quality Forum. R. Garrick reports participating in Renal Physician Association activities and serving on a Data Safety Monitoring Board for the National Institute of Diabetes and Digestive and Kidney Diseases/National Institutes of Health. A.S. Kliger reports employment with Metabolism Associates (New Haven, CT); consultancy agreements with the American Society of Nephrology (ASN); receiving honoraria for lectures, seminars, and webinars from several universities and medical schools and professional organizations; and other interests/relationships with ASN and the Renal Physicians Association. R. Garrick and A. S. Kliger are members of ASN’s Nephrologists Transforming Dialysis Safety initiative and COVID-19 response team.

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References

2. Corbett RW, Blakey S, Nitsch D, Loucaidou M, McLean A, Duncan N, Ashby DR; West London Renal and Transplant...


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See related article, “Risk of COVID-19 Disease, Dialysis Unit Attributes, and Infection Control Strategy among London In-Center Hemodialysis Patients,” on pages 1237–1246.