

Mitigating Risk of COVID-19 in Dialysis Facilities

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Coronavirus disease 2019 (COVID-19), a pandemic sweeping the world's population, is particularly threatening to patients on dialysis. This concise publication brings the evidence-based guidance of the Centers for Disease Control and Prevention (CDC) and the practical judgment of dialysis clinicians, brought together by the American Society of Nephrology (ASN), to inform best practice for in-center hemodialysis.

COVID-19 is a novel coronavirus disease caused by the severe acute respiratory syndrome coronavirus 2. Patients usually present with fever (44%–98%), cough (68%–76%), myalgia (18%), and fatigue (18%) (1,2). The infectivity of this virus is high enough to assure pandemic spread if no mitigating efforts are made to stop it. Based on data from the Diamond Princess cruise ship COVID-19 outbreak, the maximum-likelihood value of the reproductive number (R_0) was 2.8 (3). Mortality has been estimated at 1.4%–3.6% (1,2), but could be higher (4) or lower as case finding increases. Children weather the infections well, with few complications (5). Older age and comorbid hypertension, diabetes, neutrophilia, and organ and coagulation dysfunction are risk factors for adult respiratory distress syndrome and death (6). Because the approximately 0.5 million United States residents receiving maintenance dialysis treatment are primarily in this high-risk group, dialysis facilities and the professionals caring for these patients must be prepared to safely manage them and protect noninfected patients and staff from acquiring this infection. A recent report nicely describes what is currently known about COVID-19 infection and kidneys (7).

During the Ebola epidemic of 2014, patients with suspected disease were generally referred to hospitals for diagnosis and treatment. Dialysis for patients with Ebola in the United States was provided exclusively in the inpatient setting, with the structural and procedural safeguards to prevent infection transmission. This was practical because the number of patients who were infected was small. Patients were referred to a few centers with the expertise to care for them. The challenge of COVID-19 is very different: as the disease spreads in a community, many patients on dialysis in the same geographic area are likely to become infected and require continued dialysis treatments. Thrice-weekly dialysis poses the risk of infection spread among patients and staff. Early in this pandemic, patients on dialysis who are symptomatic may be referred to hospital for diagnosis and management.

However, as the epidemic spreads, hospitals become overwhelmed; emergency departments, inpatient beds, and intensive-care units fill; and patients on dialysis without serious complications must stay at home and receive their dialysis in outpatient facilities. Outpatient dialysis facilities must anticipate and prepare for dialyzing their patients infected with COVID-19 at their facility, or clustered in designated outpatient facilities.

To anticipate this challenge and to provide evidence-based guidance to patients, healthcare professionals, and dialysis facilities, the ASN established a COVID-19 Response Team in conjunction with the CDC. Nephrologists, CDC physicians, infection preventionists, and dialysis nurses meet weekly to acquire new information, share it with the community, inform best practices, and adapt to the changing environment as the pandemic spreads. A frequently-asked-questions document has been published (8), based on current CDC guidance, and is frequently updated as new information becomes available. The team has participated in discussions with chief medical officers of dialysis companies, sponsored webinars for dialysis staff, participated in webinars for patients on dialysis, and created awareness posters for dialysis facilities.

The following are some of the critical points in mitigating the risk of COVID-19 for dialysis facilities.

- Screening: Patients with COVID-19 may be asymptomatic or symptoms may appear 2–14 days after exposure. Patients with symptoms, those who have traveled to endemic areas, or those who have had contact with persons infected with COVID-19 should be asked to call ahead to the dialysis facility to anticipate their arrival. Screening personnel at a single entry to the facility should ask all patients these same questions upon arrival. If patients answer yes to any of these questions, they should be required to wear a face mask and directed to a room away from the general waiting room. Medically stable patients can wait for evaluation in their private vehicle or outside the dialysis facility. Because testing kits for confirming COVID-19 infection have been slow to disburse across the country and test results often takes several days to become available, patients with fever, new cough, or dyspnea, and those who have come into contact with people who are infected or traveled through areas with high incidence of infection should be treated as if they are infected with COVID-19 until definitive testing can

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be completed. As testing for the virus becomes more accessible, patients can later be most appropriately cohorted. Patients with progressive dyspnea, signs of organ dysfunction, or evidence for adult respiratory distress syndrome should be immediately referred to hospital.

- Patient placement: Best efforts must be made to isolate patients with suspected or confirmed COVID-19. Separate rooms with the door closed may be used if available, except those rooms used for treatment of patients with hepatitis B. If no separate room is available, patients suspected to have COVID-19 should be cohorted on a designated isolation shift, or dialyzed in a designated COVID-19 facility. If patients with COVID-19 must be treated at the same time as patients who are asymptomatic, patients who are symptomatic should be treated in a corner or end-of-row station. At least 6 feet of separation should be maintained between masked patients who are symptomatic and others. CDC guidance does not require that patients infected with COVID-19 should be treated in an airborne infection isolation room.
- Patient instructions: Patients should be instructed on the proper use of face masks. Tissues should be provided and patients instructed to cover nose and mouth when coughing or sneezing, and to discard tissues in a plastic-lined waste receptacle.
- Personal protective equipment (PPE): COVID-19 is generally spread by droplets expelled by coughing or sneezing. Fecal or direct-contact contamination may also occur. Dialysis staff should employ standard contact and droplet precautions, including isolation gowns, gloves, masks, and eye protection (shields or goggles). Because PPE likely will need to be deployed for many weeks or months in this current pandemic, care must be taken to establish policies that will not exhaust available supplies of these precious resources.
 - Face masks: CDC initially advised the use of N95 fitted masks, as is standard procedure in caring for patients with highly dangerous pathogens like tuberculosis. However, in the current environment of pandemic viral infection, standard surgical face masks are acceptable if N95 masks are unavailable. These respirators should be prioritized for procedures that are likely to generate respiratory aerosols. Furthermore, CDC does not recommend that people who are well wear a face mask to protect themselves from respiratory diseases, including COVID-19. Thus, it is recommended that face masks be used only by patients with cough or other symptoms and by clinical personnel caring for these patients.
 - Eye protection: Eye shields or goggles should be used by all personnel caring for patients with COVID-19 to avoid droplet spread *via* the eyes. Reusable shields and goggles should be cleaned and disinfected according to manufacturers' reprocessing instructions.
 - Isolation gowns: These gowns should be worn over laboratory coats, scrub suit, or street clothes. If gowns are in short supply, they should be prioritized for initiating and terminating dialysis, manipulating access needles and catheters, assisting patients to and from the dialysis station, and cleaning and disinfecting the dialysis station.
- Environmental disinfection: Routine disinfection practices—including disinfection wipes for the dialysis machine, chair, and all dialysis station surfaces (*e.g.*, the chairside

stand) and equipment, including BP cuffs and stethoscopes—should be used. Care should be taken to carefully wipe all surfaces, including all parts of the dialysis chairs after opening their arms, and allowing them to air-dry. Although no change in these recommended procedures is needed, disinfection personnel should use the same PPE as caregivers for patients infected with COVID-19. Another benefit of cohorting patients infected with COVID-19 at the end of the day would be to avoid shift turnover time pressure and allow careful terminal station disinfection.

- Communication with the Health Department: It is critical that dialysis facilities that encounter patients with possible COVID-19 communicate promptly with their local health authorities. Best practices change as we all learn more about this infection. The CDC adjusts its guidance as new knowledge becomes available, and local health departments use this guidance in the local realities of each geographic area.
- Coordination by ASN's COVID-19 Response Team: We will continue to work closely with the CDC, chief medical officers of the dialysis provider organizations, and practitioners in affected areas. In this rapidly changing environment, clinicians and administrators should review online CDC and ASN recommendations frequently (8–10).

We are witnessing a response to a pandemic that we have never seen before. The closing of schools, sporting events, museums, concert halls, businesses, and the many meetings each of us plans every day is a critical element in “social distancing,” a powerful tool to restrict transmission of this disease. Such unprecedented steps create anxiety and uncertainty in us all. Our patients and our staff need to remember that most people who have COVID-19 have mild symptoms and survive the infection with no complications. Children handle the infection especially well. Elderly and high-risk people need to think carefully about how to protect themselves. Our best strategy to stop viral transmission is frequent hand hygiene, social distancing, avoiding contact with infected people, and—if we develop symptoms—self-quarantine, use cough/sneeze etiquette, wash surfaces with disinfecting spray or wipes, and keep informed about best practice from the CDC and local health departments.

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