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Management of Advanced Chronic Kidney Disease During the COVID-19 Pandemic: Suggestions From the Canadian Society of Nephrology COVID-19 Rapid Response Team

Christine A. White[1], Joanne E. Kappel[2], Adeera Levin[3], Sarah M. Moran[1], Sanjay Pandeya[4], and Susan J. Thanabalasingam[1] On behalf of the CSN COVID-19 Rapid Response Team

Abstract

Purpose of program: To provide guidance on the management of patients with advanced chronic kidney disease (CKD) not requiring kidney replacement therapy during the COVID-19 pandemic.

Sources of information: Program-specific documents, pre-existing, and related to COVID-19; documents from national and international kidney agencies; national and international webinars, including webinars that we hosted for input and feedback; with additional information from formal and informal review of published academic literature.

Methods: Challenges in the care of patients with advanced CKD during the COVID-19 pandemic were highlighted within the Canadian Senior Renal Leaders Forum discussion group. The Canadian Society of Nephrology (CSN) developed the COVID-19 rapid response team (RRT) to address these challenges. They identified a lead with expertise in advanced CKD who identified further nephrologists and administrators to form the workgroup. A nation-wide survey of advanced CKD clinics was conducted. The initial guidance document was drafted and members of the workgroup reviewed and discussed all suggestions in detail via email and a virtual meeting. Disagreements were resolved by consensus. The document was reviewed by the CSN COVID-19 RRT, an ethicist and an infection control expert. The suggestions were presented at a CSN-sponsored interactive webinar, attended by 150 kidney health care professionals, for further peer input. The document was also sent for further feedback to experts who had participated in the initial survey. Final revisions were made based on feedback received until April 28, 2020. *Canadian Journal of Kidney Health and Disease* (CJKHD) editors reviewed the parallel process peer review and edited the manuscript for clarity.

Key findings: We identified 11 broad areas of advanced CKD care management that may be affected by the COVID-19 pandemic: (1) clinic visit scheduling, (2) clinic visit type, (3) provision of multidisciplinary care, (4) bloodwork, (5) patient education/support, (6) home-based monitoring essentials, (7) new referrals to multidisciplinary care clinic, (8) kidney replacement therapy, (9) medications, (10) personal protective equipment, and (11) COVID-19 risk in CKD. We make specific suggestions for each of these areas.

Limitations: The suggestions in this paper are expert opinion, and subject to the biases associated with this level of evidence. To expedite the publication of this work, a parallel review process was created that may not be as robust as standard arms' length peer-review processes.

Implications: These suggestions are intended to provide guidance for advanced CKD directors, clinicians, and administrators on how to provide the best care possible during a time of altered priorities and reduced resources.

Keywords

COVID-19, CKD (chronic kidney disease), recommendations

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Purpose of the Program

Coronavirus disease 2019 (COVID-19) has had a profound impact on the kidney community. Patients with kidney disease are at increased risk for complications from COVID-19, and also from a change in the usual level of support that they receive from their kidney health care providers and other community services in managing their chronic disease.

Kidney programs across the country are developing policies in this rapidly changing environment. The Canadian Society of Nephrology (CSN|SCN) is in a unique position to collate guidance documents from the kidney community to provide the best possible care to the largest number of patients with kidney disease, while ensuring the safety of the health care team and upholding ethical principles.

This document will provide suggestions on how to provide the best possible care for patients living with advanced chronic kidney disease (CKD) using a different model of care, with different resources available in an environment with COVID-19. These suggestions pertain to the care of patients with advanced CKD who would typically receive multidisciplinary CKD care and be followed in a multidisciplinary care clinic. The care of other kidney disease populations, including those with less advanced forms of CKD, is outside the scope of this document. The suggestions in this document pertain only to the unique aspects of multidisciplinary CKD care. Other general care practices should follow the most current provincial public health policies. The suggestions outlined in this guidance document represent best practices based on information available at the time of writing on April 28, 2020.

General Principles of Care for Patients With Advanced Chronic Kidney Disease Not Requiring Kidney Replacement Therapy (KRT), in the COVID-19 Era

The following principles guided our work to help ensure that decisions are ethically supported:

1. Uncertainty—acknowledge that clinicians and administrators are now working in a swiftly evolving environment which will require decision making with limited resources and levels of uncertainty that are higher than usual.
2. Macro-allocation—acknowledge that the local context and local government priorities will shape decision making and that previous sacrosanct standards may need to be temporarily adjusted in order to maximize health outcomes for the greatest number of patients.
3. Minimize net harm—limit the spread of disease and the disruption to the health care system.
4. Reciprocity—protect our healthcare workforce from COVID-19 as an end in itself, so that staffing levels needed for the delivery of care to patients who, by definition, require physical interventions are achieved.
5. Fairness—ensure that patients with kidney disease continue to receive appropriate treatments regardless of their COVID-19 status and avoid outcomes that disproportionately impact those who are most vulnerable (eg, lower socioeconomic status).
6. Proportionality—keep restrictions on staff and patients commensurate with the level of risk to public health.
7. Respect for autonomy—continue to reflect patient values and beliefs as much as possible, granting that choices may be limited in a pandemic.
8. Fidelity—maintain commitment to patients to provide necessary care, even through challenging times and when there is a degree of risk to providers.

Sources of Information

1. BC Renal Agency
2. U.K. Renal Association
3. Alberta Kidney Care South Regional guidelines
4. Canadian Cardiovascular Society
5. Canadian National CKD Survey (April 2020)
6. Ontario Renal Network—regional kidney program (COVID-19) recommendations
7. Expert opinions and emails (all provinces)
8. American Society of Diagnostic and Interventional Nephrology
9. Vascular Access Society of the Americas
10. CKD programs survey results from: Dalhousie University (NS), Halton Health Care (ON), Health

[1]Queen's University, Kingston, ON, Canada
[2]University of Saskatchewan, Saskatoon, Canada
[3]The University of British Columbia, Vancouver, Canada
[4]Halton Healthcare, Oakville, ON, Canada

Corresponding Author:
Christine A. White, Medical Director, Chronic Kidney Disease, Division of Nephrology, Department of Medicine, Queen's University, Etherington Hall, 94 Stuart Street, Kingston, ON, Canada K7L2N6.
Email: cw38@queensu.ca

Sciences North (ON), Lakeridge Health (ON), McGill University (QC), McKenzie Health (ON), McMaster University (ON), Memorial University (NL), Peterborough Regional Health Center (ON), Queen Elizabeth Hospital (PEI), Queen's University (ON), Saint John Regional Hospital (NB), Trillium Health Partners-Credit Valley (ON), Université de Montréal (QC), Université Laval (QC), University of Alberta (AB), University of British Columbia (BC), University of Calgary (AB), University Health Network (ON), University of Manitoba (MB), University of Ottawa (ON), University of Saskatchewan (SK), and Western University (ON).

Methods

In the context of the pandemic, individual regional programs rapidly developed policy. The CSN developed the CSN COVID-19 rapid response team (CCRRT) by recruiting volunteers from within the CSN Board who identified other experts within the kidney community. Available COVID-19 documents from programs across the country were collected. Other national and international kidney agency literature and webinars were viewed for recommendations that could be applied to the Canadian environment but few were found. In select circumstances, a review of the published literature was undertaken. A survey of multidisciplinary CKD care provision in the era of COVID-19 was conducted between April 6 to 13, 2020 in academic (n = 15) and community (n = 8) Canadian CKD programs. Experts in Europe were contacted to obtain society guidelines and to provide experiential perspectives of CKD care in the more advanced stages of the COVID-19 pandemic. Once the document was thought to be complete, it was reviewed by the entire CCRRT, a community nephrologist, 2 nephrologist ethicists, and an infection control expert. Final revisions followed a public webinar of 150 kidney professionals sponsored by the CSN.

Context. Narrative Summary of CSN Multidisciplinary CKD Care Survey Results: Current State as of April 2020

Overall, most programs have enacted similar approaches to the provision and delivery of multidisciplinary CKD care. No programs reported significant human resource concerns. A minority of programs have preemptively enacted protocols anticipating surge situations and reduced human resource availability. The results, summarized below, informed some of the guidance statements that follow.

Clinic Visit Schedules: Most programs are continuing their prescheduled clinic visits although prolonging follow-up visits is common if the patient is stable. A minority of programs (n=3) are canceling clinic visits based on eGFR and nursing or nephrologist screening.

Clinic Visit Type; ***Telehealth Use***: All programs have converted to telehealth visits except for a small number of urgent patients deemed to require an in-person visit. Telephone call visits predominate, with little uptake of videoconferencing. Several programs have attempted videoconferencing, but report the current technology to be challenging for this patient population. One program responded that videoconferencing is the preferred method of assessment, and has provided significant training to staff and patients.

Provision of Multidisciplinary Care: Most programs are continuing to provide multidisciplinary care. In a small minority of programs (n = 3), the physician is not involved unless the patient is flagged by nursing.

Blood Work Frequency: Most programs continue to request that patients get bloodwork done, although many have reduced blood work frequency and do not insist if patients decline. A minority of programs are instructing patients not to have bloodwork done unless deemed necessary by the care team (n = 4). In some more remote locations, blood work is not easily obtained outside the hospital setting and therefore is more difficult for patients to access.

***Patient Education and Support*:** Programs report that KRT education is offered only if deemed urgent. This is mostly being provided using telehealth.

***Fistulas*:** The majority of programs report that access to arteriovenous fistula (AVF) creation is difficult, but a few have made a case to administration and been permitted to have surgeons create AVFs, particularly in the context of very low GFR and no other working access already *in situ.*

Peritoneal Dialysis (PD) Catheters: Most (n = 17) programs report that PD catheters continue to be placed. Most of the remaining programs report ongoing negotiations to have these reinstated.

Suggestions

1 Adhere to Clinic Visit Schedules

1.1. We suggest that programs adhere to previously established clinic visit schedules, where resources permit.
1.2. We suggest that patients receive their clinic visit if blood work is unavailable.
1.3. We suggest pre-emptively communicating the center's plan for ongoing care to all multidisciplinary care clinic patients to avoid patient-initiated clinic visit cancelation with the attendant risk of becoming lost to follow-up. A locally developed letter to all multidisciplinary care patients is one option.
1.4. We suggest that a tracking system be developed to establish an appropriate follow-up management plan and rebooking for clinic visits that are canceled by the patient or the clinic.

Rationale. Continuing prescheduled clinic visits ensures patients are provided with appropriate supportive and disease modifying kidney care. In particular, there is a need to prevent

worsening symptomatology, "crash starts," hospital admissions for advanced uremia and other serious intercurrent events that may occur in the absence of usual surveillance and care. Detailed screening of charts to triage patients is resource intensive and likely does not significantly decrease workload compared with continuing clinic appointments. In addition, canceling appointments has the potential to create confusion for patients and care providers about the importance of regular surveillance if drastic reductions in access to care are implemented in the absence of resource issues as currently stands. Pre-emptively communicating the center's plan for ongoing care to all multidisciplinary care clinic patients will reduce patient-initiated clinic visit cancelation with its attendant risk of becoming lost to follow-up.

2 Clinic Visit Type: Telehealth Use

2.1. We suggest that patients receive telehealth visits as permitted by local medical associations and other constraints, unless the care team judges that an in-person visit is required.
2.2. We suggest that in advance of the telehealth visit, patients be called and reminded to have blood work completed, have an updated medication list created, daily blood pressures readings recorded (if possible), and weight (if possible) available for review at the time of the visit.
2.3. For those urgent patients who are deemed to require an in-person visit, we suggest that a COVID-19 screening questionnaire be completed by telephone before they are brought to multidisciplinary care clinic for in-person assessment.
- We suggest patients who screen positive be directed to the most appropriate facility in keeping with local Infection Prevention and Control (IPAC) guidelines.
- We suggest patients who screen negative be evaluated in multidisciplinary care.

Rationale. In this document, we adhere to the World Health Organization's broad description of the term telehealth. Telehealth refers to the use of various types of information and communication technologies to deliver health care services where providers and patients are separated by distance.[1] Telehealth includes technologies such as telephone and web-based applications (eg, teleconsultations and teleconferences, e-mail, digital still images, video), among others. Telephone visits may be easier for patients in the advanced CKD population to manage than videoconferencing.

Telehealth facilitates access to routine care while limiting both health care provider and patient risk of exposure to COVID-19.[2] Evidence in several jurisdictions supports use of telehealth in CKD care. An observational study of nephrology clinics run via videoconference in Australia found these to be economical and have outcomes comparable to those obtained by standard care (renin-angiotensin system inhibitors [RASi] and lipid-lowering drug use, clinic attendance rate, hospital admissions, length of stay, KRT, and overall mortality).[3] Additionally, among geographically remote patients in the United States with CKD, a clinical video telehealth system was shown to improve adherence to clinic visits while delivering comparable clinical outcomes (doubling of serum creatinine, progression to end-stage renal disease [ESRD], death) over a 2-year follow-up period.[4,5]

Communication with patients prior to telehealth visits with reminders to have blood work completed, medication list prepared and blood pressure and weights documented should improve both clinic efficiency and effectiveness. In-person visits should be reserved for patients requiring urgent assessment to minimize exposure risk for both healthcare providers and patients.

3 Provision of Multidisciplinary Care

3.1. We suggest that multidisciplinary care continue to be provided if resources permit.
3.2. We suggest that providers work using physically distanced spaces, computers and telephones, as resources permit, during all clinical encounters, both in-person and telehealth.
3.3. We suggest that providers communicate when possible with one another via telephone calls, secure e-mails and electronic medical records, if available.
3.4. We suggest that paperwork generated during clinic visits (prescriptions, bloodwork and other requisitions) be handled by as few people as possible.
3.5. We suggest that clinic documentation be continued, and information be conveyed to the primary care provider, in keeping with usual practice.
3.6. We suggest regular use of video or other "visual" means to continue social interaction between team members, where group communication has been a component of the multidisciplinary care usual operations, and where group meetings foster improved understanding of patients' needs.

Rationale. The use of telehealth to deliver routine multidisciplinary care clinics, not in times of pandemic, has been studied. An inter-professional team in the Veterans Affairs Health System implemented telehealth multidisciplinary care clinics in 2016, giving patients touch-screen computers to facilitate video visits. The telehealth multidisciplinary care clinics were noninferior to standard in-person care for a composite outcome of death, hospitalization, emergency department visits, and admission to skilled nursing facilities.[6,7] A multidisciplinary approach allows for division of the workload between care professionals and provides patients with varied expertise and supports. The multi-disciplinary approach should be conducted while adhering to social distancing measures to ensure the safety of healthcare providers.

4 Bloodwork

4.1. We suggest that patients be informed that outpatient laboratories are held to strict disinfectant standards and have been instructed in safe methods to draw blood, including limiting numbers of patients in waiting areas, and appropriate personal protective equipment (PPE).
4.2. We suggest that patients continue to have bloodwork done before clinic appointments, provided local COVID-19 prevalence rates remain low and laboratory resources are available.
4.3. We suggest establishing systems to follow-up on laboratory values in a time-sensitive manner if a clinic visit is deferred.
4.4. We suggest bloodwork frequency for standing orders be assessed on an individual basis by the nephrologist most responsible for care.

Rationale. Reassurance around the safety of outpatient laboratories may be necessary, as there is much fear among patients. Both Lifelabs[8] and Dynacare[9] have instituted appropriate measures to minimize infection risk as will have all hospital-based phlebotomy, in keeping with local policies. In coming to these suggestions, we thought that the clinical benefit to the patient outweighed the risks of having bloodwork drawn, but recognized that this may vary by time, place, and the exact clinical circumstances of the patient.

5 Patient Education and Support

5.1. We suggest that patients who are approaching the need for KRT, receive KRT education delivered virtually if possible and with use of online resources. Vetted informational websites, mobile applications maintained by professional organizations and patient-driven online forums may be compiled and shared with patients. Where access to internet and electronic devices are limited, education materials can be mailed or information conveyed via telephone.
5.2. We suggest reinforcing education around uremia during visits and reminding patients of the need to immediately contact the multidisciplinary care team if any symptoms of uremia are noted as per usual clinical practice.
5.3. We suggest mailing multidisciplinary care patients a physical copy of educational material pertaining to suggested sick day medication changes. These should be verbally reinforced during clinic visits explicitly identifying the specific medications that should be held for individual patients, as needed.

Rationale. Compared with in-person KRT education, content delivered using telehealth has the benefits of being flexible, adaptable to patient learning styles/preferences, and easily amenable to repetition and reinforcement.[10] Potential resources are outlined below:

- http://kidney.ca
- http://bcrenalagencymedia.ca/modality-choices
- http://www.bcrenalagency.ca/health-info/managing-my-care/transitions-in-kidney-care
- https://www.ontariorenalnetwork.ca/en/kidney-care-resources/living-with-chronic-kidney-disease/about-dialysis
- https://choosingdialysis.org/Home.aspx
- https://www.kidney.org/atoz/content/choosingtreat

Reinforcing education around uremia may reduce the risk of clinical deterioration at home and subsequent "crash starts," hospitalizations and other adverse outcomes, which have been experienced in some European centers (personal communication Markus van der Giet). Educational material on sick-day rules (suggested medication changes on days when the patient is unwell enough to do their usual activities) may help to avoid preventable acute kidney injury (AKI) and other adverse outcomes that may result in avoidable contact with the healthcare system.

6 Home-Based Monitoring Essentials

6.1. We suggest that patients be asked to monitor their blood pressure at home. For patients with private drug insurance, a prescription should be mailed to the patient or faxed to their pharmacy for a home blood pressure monitoring cuff. Patients over 65 years of age may be eligible for provincial coverage, depending on the province of residence. Patients with financial constraints should be referred to a social worker to help them access local resources.
6.2. We suggest that patients be asked to monitor their weight at home.

Rationale. Having tools to monitor blood pressure and weights is essential to facilitate telehealth multidisciplinary care visits and enable the provision of disease-modifying therapy and appropriate symptom management. Patients with CKD should be supplied with these basic tools regardless of socioeconomic status.

7 New Referrals to Multidisciplinary Care

7.1. We suggest that new referrals to multidisciplinary care clinic be requested only if the patient is anticipated to require KRT within the next 3 months, or if the patient absolutely requires multidisciplinary care education and care for some other reason.

Rationale. Provision of kidney care is challenging by telehealth, and even more so when the patient and care providers are unknown to each other. We suggest that ongoing care for patients without an absolute need for multidisciplinary care providers is best provided during the COVID-19 pandemic by the care team with whom patients have a preexisting therapeutic relationship.

8 KRT

8.1. We suggest that home therapies be promoted over in-center hemodialysis to reduce COVID-19 transmission risk by reducing the number of contacts with clinics and hospitals. All patients and their caregivers should be assessed to ascertain readiness, ability and safety to perform home therapies.

8.2 We suggest that kidney care providers and administrators advocate strongly for PD catheter insertion and fistula creation to be considered essential, not elective services.

8.3. We suggest initiation of access coordination in patients with eGFR $<$ 12 ml/min/1.73 m^2 and decreasing, who are likely to require KRT within 1–3 months, and in patients with rapidly decreasingly GFR who are likely to require KRT in the near future.

Rationale. PD catheter and fistula creation should be prioritized given they facilitate avoidance of "crash" hemodialysis line insertions with their attendant adverse consequences. The American Society of Diagnostic and Interventional Nephrology and the Vascular Access Society of the Americas have both recommended that PD catheter insertions be designated as "urgent/emergent" procedures. The patient and their care providers however must be willing and able to safely provide home therapies. Refer to the Home Dialysis CCRRT guiding document for further information.

9 Medications

9.1. We suggest that disease-modifying and other important medications (eg, erythropoietin stimulating agents [ESA], intravenous iron, sodium-glucose-cotransporter-2 (SGLT2) inhibitors, RASi, diuretics), usually initiated as part of standard clinical care, be prescribed in accordance with best practices as long as appropriate monitoring is feasible and patient is agreeable.

9.2. We suggest that education on how to administer ESA be delivered using telehealth, ideally using videoconferencing and online resources, if possible and deemed appropriate.

9.3. We suggest that providers and patients adhere to physical distancing practices and that drug dispensation, where needed, occur with minimal contact between the patient and the hospital or clinic environment (eg, deliver the medication to the patient in their vehicle).

9.4. We suggest that RASi should not be discontinued as a result of the COVID-19 pandemic.

9.5. We suggest that RASi be temporarily discontinued, in keeping with sick-day rules, in patients with symptoms of COVID-19 or other volume-depleting illnesses, as is usual practice, unless there are compelling reasons to continue them.

Rationale. Patients with advanced CKD should not be denied the benefits of disease-modifying agents or other important pharmacologic interventions due to the COVID-19 pandemic. ESA initiation is unique among these agents, given its route of administration and the particularities of how it is dispensed. Special consideration of these differences must be given when starting ESAs, while adhering to physical distancing best practices. Various educational resources for subcutaneous injection are available online.

The interactions between the RAS system and SARS-CoV-2, by virtue of the binding of the virus to ACE-2, have generated theories of both potential harm and benefit of RAS inhibitor use during the pandemic.[11] Evidence supporting or refuting these theories are limited at the time of writing. Our suggestion to refrain from routine discontinuation of RASi during the COVID-19 pandemic is in agreement with recommendations from the Canadian Cardiovascular Society and multiple other relevant societies.[11-14] They argue, and we agree, that there are potential unintended consequences of discontinuing these therapies, and that the experimental and clinical evidence on which the suggestion to discontinue is based, are limited. We suggest temporarily discontinuing these agents in patients with symptoms of COVID-19, given the increased risk of AKI and the known increased risk of more severe disease with COVID-19 infection in patients who have CKD.[15] Studies that demonstrate lack of harm from continuing these agents in patients hospitalized with COVID-19[16,17] were not conducted in a patients with CKD.

10 PPE

10.1. We suggest that PPE be available to all staff members and used according to local practices and national guidelines, based on the nature of contact with the patient.

Rationale. As the COVID-19 epidemic evolves, we foresee that PPE policies may require revision for healthcare workers and other hospital staff with direct patient contact, regardless of COVID-19 status, because we anticipate that the incidence of asymptomatic COVID-19 will increase. This will need to be balanced with the availability of PPE in the local environment.

11 COVID-19 Risk in CKD

11.1. We suggest that questions around whether or not patients with CKD be advised to refrain from working should be handled on a case-by-case basis, with particular consideration of the exposure risk inherent in their occupation and the presence of other comorbidities also associated with more severe infection (eg, diabetes, hypertension, and cardiovascular disease).[18]

Rationale. Based on available data, CKD appears to be associated with increased risk of severe COVID-19 infection.[15] There are insufficient data to determine whether patients with CKD G4-5 not dialyzed (ND), who are not receiving immunosuppression agents for their condition, are at increased risk of infection. Advanced age, and comorbidities (diabetes, hypertension and chronic obstructive pulmonary disease) are associated with increased risk and severity, and these comorbidities are highly prevalent in patients with CKD.[19,20]

Limitations

Because of limited time and resources, no attempt was made to do a systematic review of the literature, but rather we focused on the questions posed within the Canadian senior renal leaders community of practice and others. The suggestions are based predominately on expert opinion, best information at the time, extrapolation from infection control practices, and existing pandemic documents, and are subject to the usual biases and incomplete information associated with these forms of evidence and advice. We have assumed that all regions in Canada will ultimately have COVID-19 within their communities and must prepare for this eventuality. However, it is likely that the risks of COVID-19 exposure will be highly variable across the country, mandating implementation of policies commensurate with risk. Most of the strategies have not been formally tested in clinical environments and we recognize that local contexts may impede their implementation.

Implications

These suggestions are intended to provide the best care possible during a time of reduced resources. Protection of patients and healthcare providers by limiting potential exposure to COVID-19 was paramount in these suggestions.

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Steering Committee: Adeera Levin, Reem A. Mustafa, Gihad Nesrallah, Steven Soroka, and Deborah Zimmerman.

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ORCID iDs

Sarah M. Moran https://orcid.org/0000-0001-9377-4133
Susan J. Thanabalasingam https://orcid.org/0000-0002-8948-1730

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