


Canadian Society of Nephrology COVID-19 Rapid Response Team Home Dialysis Recommendations

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Abstract

Purpose of program: This paper will provide guidance on how to best manage patients with end-stage kidney disease who will be or are being treated with home dialysis 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: Members of the Canadian Society of Nephrology (CSN) Board of Directors solicited a team of clinicians and administrators with expertise in home dialysis. Specific COVID-19-related themes in home dialysis were determined by the Canadian senior renal leaders community of practice, a group comprising medical and administrative leaders of provincial and health authority renal programs. We then developed consensus-based recommendations virtually by the CSN work-group with input from ethicists with nephrology training. The recommendations were further reviewed by community nephrologists and over a CSN-sponsored webinar, attended by 225 kidney health care professionals, for further peer input. The final consensus recommendations also incorporated review by the editors at the Canadian Journal of Kidney Health and Disease (CJHD).

Key findings: We identified 7 broad areas of home dialysis practice management that may be affected by the COVID-19 pandemic: (1) peritoneal dialysis catheter placement, (2) home dialysis training, (3) home dialysis management, (4) personal protective equipment, (5) product delivery, (6) minimizing direct health care provider and patient contact, and (7) assisted peritoneal dialysis in the community. We make specific suggestions and recommendations for each of these areas.

Limitations: This suggestions and recommendations 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 recommendations are intended to provide the best care possible during a time of altered priorities and reduced resources.

Keywords

COVID-19, home dialysis, 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 in an effort to provide the best possible care to the largest number of patients with kidney disease while we ensure the safety of the health care team and uphold ethical principles.

In general, home dialysis therapies for patients with end-stage kidney disease (ESKD) minimize the number of interactions required between patients and the health care system. This paper will provide guidance on how to best manage patients with ESKD who will be or are being treated with home dialysis.

General Principles of Care for Patients With ESKD 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.
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. Alberta Kidney Care South Regional guidelines
2. American Society of Nephrology. March 2020. *Information for Screening and Management of COVID-19 in the Outpatient Dialysis Facility*.
3. BC Renal Agency
4. Expert opinions and emails (all provinces)
5. International Society of Peritoneal Dialysis. March 2020. *Strategies regarding COVID-19 in PD patients (adapted from Peking University First Hospital)*. https://ispd.org/wp-content/uploads/ISPD-PD-management-in-COVID-19_ENG.pdf
6. **ASDIN and VASA Issue Joint Statement—Maintaining Lifelines for ESKD Patients**, <http://www.vasamd.org/about/latest-news/369-maintaining-lifelines-for-eskd-patients-asdin-and-vasa-joint-statement>
7. <https://www.canada.ca/en/health-canada/services/drugs-health-products/medical-devices/activities/announcements/covid19-notice-home-made-masks.html>
8. <https://www.cdc.gov/coronavirus/2019-ncov/hcp/ppe-strategy/face-masks.html>
9. <https://www.cdc.gov/dialysis/prevention-tools/scrub-protocols.html>
10. <https://buyandsell.gc.ca/specifications-for-COVID-19-products#100>
11. Ontario Renal Network—regional kidney program (COVID-19) recommendations

Methods

In the context of the pandemic, individual regional programs rapidly developed policy. The CSN developed the COVID-19 rapid response team (RRT) 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. In select circumstances, a

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review of the published literature was also undertaken. Once the document was felt to be complete, it was reviewed by the entire CSN COVID-19 RRT, a community nephrologist and 2 nephrologist ethicists. Final revisions followed a public webinar of 225 kidney professionals sponsored by the CSN.

We use “we recommend” when we thought the evidence was strongest and the likelihood of benefit high. We use “we suggest” when we reached consensus, but the evidence did not reach this standard.

Recommendations

1. Peritoneal Dialysis (PD) Catheter Placement Continues Unabated Where Resources Permit

We suggest that PD catheter insertions (bedside and surgical) be designated as “urgent/emergent” procedures and continue to be placed for patients who are expected to require dialysis in the next 2 months (eGFR < 12 mL/min/1.73 m² and declining) during the COVID-19 pandemic, as recommended by the American Society of Diagnostic and Interventional Nephrology and Vascular Access Society of the Americas.

- 1.1. We recommend each program maintain and update a list of patients who have completed all PD pre-insertion assessment tasks (including an evaluation for the most appropriate catheter insertion method), and use this list to support the need for ongoing PD access procedures.
- 1.2. We suggest that nephrologists perform the medical pre-operative assessment to facilitate surgical placement of PD catheters, if access to pre-operative internal medicine clinics becomes a limiting step.
- 1.3. We recommend that patients wishing to convert from in-center HD to PD for any reason, including the mitigation of risk from COVID-19, also be considered for urgent PD catheter insertion.

Rationale. Patients with advanced chronic kidney disease (G5 not dialyzed [G5ND]) who do not have a PD catheter placed in advance of starting dialysis will require a central venous catheter (CVC) and will need to be treated with in-center hemodialysis (HD). Patients who start dialysis in this way (crash starts) have increased risk of morbidity and mortality.¹ During the COVID-19 pandemic, they are also more likely to use additional health care resources and more likely to have high levels of exposure to health care workers. Recommending PD as a modality in which definitive access can be placed at the outset is efficient and will reduce the number of patients requiring in-center HD. Allowing patients to transfer from in-center HD to PD to mitigate their personal COVID-19 risk, or for any other reason, is valuable in itself, and reduces the resources needed for provision of in-center

HD. Adequate downstream staff and support, particularly community support after training, is essential.

2. Training for Home Dialysis: PD and Home Hemodialysis (HHD)

- 2.1. We suggest that home dialysis be preferentially offered to all patients who require chronic kidney replacement therapy, as a means of reducing COVID-19 transmission risk to themselves, to other patients, and to health care workers, by reducing contact with clinics and hospitals, compared with in-center HD.
- 2.2. We recommend, for eligible candidates, PD over HHD because of the shorter training time.
- 2.3. We suggest that units tailor workflow to accommodate potentially higher volumes of patients being trained on PD and HHD, including urgent starts for both modalities.
- 2.4. We suggest, for most patients starting PD, that training for chronic ambulatory peritoneal dialysis (CAPD) be preferred to continuous cycler peritoneal dialysis (CCPD) to minimize contact and time spent with healthcare providers
- 2.5. We suggest that traditional training programs be modified, where feasible, to minimize the need for patients to attend the local clinic, which protects patients and health care workers. We suggest building personnel capacity for training, and using and creating video and online modules to reduce 1:1 time spent with trainers and so maximize the number of patients trained.
- 2.6. We suggest creating and using a streamlined CAPD training curriculum, including a check list of “essential tasks,” to minimize training time. BC Renal Agency is expected to have one developed by the week of April 21, 2020
- 2.7. We suggest that patients already treated with CAPD not be retrained for CCPD training during the pandemic, unless there are compelling indications. We suggest management of volume status with fluid and salt restriction, combined with high-dose diuretics in patients with residual kidney function.
- 2.8. We recommend continuing to train patients for HHD, provided trained staff are available who are not required to redeploy to meet a more-compelling need. We suggest selecting patients who are anticipated to be able to train safely and rapidly.
- 2.9. We suggest that for patients with a CVC in situ, needle training of arteriovenous access be delayed to facilitate faster training in HHD.
- 2.10. We suggest that for patients with mature arteriovenous access and no CVC, needle training proceeds as usual. If this is anticipated to become, or becomes, time consuming such that discharge home will be

delayed, we suggest placing a CVC to facilitate faster training in HHD.

- 2.11. For HHD programs which support multiple platforms (conventional HD machine versus newer platforms, eg, NxStage System One, Fresenius Medical Care), we recommend that training focus should be on the platform that is associated with shorter learning time and fewer home renovations.
- 2.12. For HHD programs using conventional HD machines only, we suggest that attention is directed closely to the availability of local tradespeople to effect electrical and plumbing modifications, and we suggest early engagement with local trades to reduce this barrier to independence at home. When trades must go into the home, we suggest that they practice physical distancing, proper hand hygiene, and wear a surgical mask; this needs to be reviewed at time of engagement.
- 2.13. We suggest that all travel programs for patients treated with home modalities be suspended immediately and indefinitely.

Rationale. Patients with ESKD treated with in-center HD typically must come to the dialysis unit 3 times weekly, often using some form of public transportation, greatly increasing their risk of COVID-19 exposure. The intensive nature of the treatment requires significant health-care workforce utilization that may be reduced during the pandemic. Home dialysis therapies maintain social distancing, often without additional nursing support. Follow-up visits usually occur approximately every 2 to 3 months; such visits can be conducted using telehealth, further reducing the need for direct contact between the patient and the health care team. PD is preferred to HHD because of the reduced training time required to prepare the patient for independent home dialysis. CAPD is preferred to CCPD for the same reasons. HD platforms that are easier to learn and require minimal modifications to the home are also preferred over more traditional HD machines as they reduce exposure of patients to the health care team and tradespeople (ie, plumbers, electricians)

3. Home Dialysis Management

- 3.1. We suggest that patients have a minimum of 2 weeks of PD or HHD supplies and medications, in case they require self-isolation, or there is a disruption in delivery of supplies. We recommend rotating these supplies to minimize wastage from expiry.
- 3.2. We recommend that patients follow public health advice and stay home, that visits by family and friends should be minimized, and visits by health care workers limited to those needed to provide training or treatment.

- 3.3. We recommend that if a health care worker must go into the home, that this be used as an opportunity to bring supplies to the patient that they might otherwise have had pick up in person at the home dialysis unit (eg, dressings, specialized tape, or thrombolytics).
 - 3.4. We recommend reinforcing hand hygiene protocols with both written and visual literature for both patients and health care workers, including procedural steps where liquid soap and water may be used in place of alcohol-based hand sanitizer.
 - 3.5. If Health-Canada approved hand sanitizer is not available, we suggest:
 - Using locally produced alcohol-based hand sanitizer containing 60% to 80% ethanol or isopropyl alcohol,
 - Handwashing with liquid soap for 20 seconds.
 - 3.6. We recommend ensuring that all team members have received appropriate education and supervision with regards to hand hygiene and personal protective equipment (PPE), and that the home unit is adequately equipped with necessary equipment such as soap, sinks, paper towels, and alcohol-based sanitizer that are easily accessible
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Rationale. Patients with ESKD are high risk for complications from COVID-19 infection. For this reason, visitation by the health care team, family and friends should be minimized. Hand hygiene protocols should be reviewed and strengthened; as many as 50% of home patients are not washing their hands for dialysate exchanges within 6 months of training.² Alcohol-based hand sanitizer is more effective than handwashing with soap and water in reducing microbial flora, and therefore theoretically more effective in reducing the risk of infection associated with connection procedures.³ However, given the lack of randomized trial data to support this assertion, liquid soap and water may be used for some or all aspects of the connection procedure to extend the supply of alcohol-based hand sanitizer.

4. Personal Protective Equipment (PPE)

- 4.1. We recommend that all home dialysis patients be provided with written or verbal information regarding the signs and symptoms of COVID-19.
- 4.2. We recommend that patients be reminded of their responsibility to report their symptoms and be reassured that any symptoms reported will not impact the ability to continue with their treatments.
- 4.3. We recommend that screening questions be answered in keeping with local policy, before a patient enters a home dialysis unit or clinic, and before staff and health care workers come into contact with the patient.

PPE for staff caring for COVID-probable (exposure and symptoms), suspected (no exposure but with symptoms on screening) or COVID-positive patients (see Outpatient HD during COVID-19 pandemic for details)

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- 4.4. If yes to any of the above, we recommend that the patient be approached as COVID-19 positive, using appropriate PPE, following local infection prevention and control (IPAC) guidelines: at the time of writing, this would include surgical mask, visor, gown and gloves.
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PPE for staff caring for COVID-swab-negative and low-risk patients (no known exposure, no symptoms), or untested and low risk

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- 4.5. PPE should be available to all staff members and used according to local practices and national guidelines based on the nature of contact with the patient. For most home dialysis patients, this would include the staff wearing a surgical mask.
- 4.6. As the COVID epidemic evolves, we foresee that PPE policies may require revision for healthcare workers with direct patient contact regardless of COVID status due to the potentially increased incidence of asymptomatic COVID patients. This will need to be balanced with the availability of PPE in the local environment.

PPE for PD and HHD patients

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- 4.7. We suggest that masks are not needed for routine PD exchanges, and that it is acceptable to instruct asymptomatic patients not to use masks.
- 4.8. We suggest that surgical masks, or cloth masks, if a surgical mask is not available, continue to be used, for accessing CVCs, or for accessing arteriovenous fistulas with buttonhole technique pre- and post-dialysis; if masks are not available, we suggest that it is acceptable to perform these procedures without a mask.
- 4.9. We suggest that patients with respiratory symptoms use a surgical mask, or cloth mask if a surgical mask is not available; if masks are not available, we suggest that it is acceptable to perform these procedures without a mask; patients should take care not to sneeze or cough on the connection.
- 4.10. For patients, who must come into the home dialysis unit for assessment, or for patients who require a health care worker to come into their home, we recommend that the patient wear a surgical mask if tolerated, anticipating that optimal strategies may change with time and circumstances.
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Rationale. Although many PD programs teach patients to use a mask when doing dialysate exchanges, ISPD 2016

guidelines state that masks are not necessary in asymptomatic patients: this would become important were mask supplies to be limited.⁴ Most HHD programs teach patients to use a mask when accessing CVCs or when needling arteriovenous fistula with buttonhole technique.⁵ However, data supporting use of routine masks for catheter access is lacking: in situations where mask supply is limited, the Center for Disease Control endorses a strategy in which masks are not used for connection or disconnection. Limiting the use of PPE for PD dialysate exchanges and HD connections may extend the supply, so that masks can be used to prevent the transmission of COVID-19 between patients and the health care team. It may also be acceptable to use a cloth mask in place of a surgical mask for low risk procedures as per recent public health policy. As the presentation of COVID-19 may be atypical in dialysis patients, we have suggested surgical mask use for patients who will be in contact with the health care team. We have also suggested surgical mask use when members of the health team must interact with home dialysis patients due to the high risk of COVID-19 complications in this population.

5. Ensure Delivery of a Product Is Conducted in a Safe Manner

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- 5.1. We suggest ongoing open communication with dialysis vendors and suppliers to ensure timely and safe delivery for both patients and drivers.
- 5.2. We recommend telephone pre-screening of patients for COVID-19 status and COVID-19 symptoms. If positive for either, arrangements for product delivery be coordinated with the home dialysis unit.
- 5.3. We recommend physical distancing be maintained between patients and drivers during product delivery.
- 5.4. We recommend hand hygiene and surgical masks for drivers who must go into the home, aligned with our recommendations for health care workers.
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Rationale. Delivery of product into a patient's home requires contact between the patient, delivery driver, and product. All of the hospital infection control policies to protect patients and the health care team apply to delivery drivers.

6. Minimizing In-Person Contact With Health Care Providers

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- 6.1. We suggest that routine follow-up and elective procedures such as assessment of peritoneal membrane characteristics and clearances should be delayed in almost all patients.
- 6.2. We suggest delaying transfer set changes for up to 6 to 9 months unless there appears to be a compromise to the integrity of the transfer set (this recommendation

does not apply to programs that use bleach containing agents for disinfection in which the usual 6-month protocol still applies), and that patients should visually inspect and photograph any cracks, breaks, or changes in color, and report to their PD team immediately.

- 6.3. We suggest that routine arteriovenous access flow measurements for patients treated with HHD should be delayed, and that patients be educated to monitor for onset of difficulty needling, prolonged bleeding after dialysis, or elevated arterial/venous pressures as surrogates of arteriovenous access dysfunction, and report them to the HHD team for consideration of access flow measurement or definitive investigation.
- 6.4. We suggest that consideration be given to a local policy, reducing the frequency of laboratory testing for stable patients (determined by programmatic review) from the current practice of every 1 to 2 months, to every 2 to 3 months, to minimize patient visits for blood tests.
- 6.5. We suggest changing all PD and HHD visits to telehealth (video or telephone), with the exception of patients who, in the judgment of the team, would benefit from an in-person assessment.
- 6.6. We suggest that patients with new non-serious symptoms consider calling the home dialysis team for advice, rather than referring themselves directly to emergency, and that patients with severe or serious symptoms should contact 911 as usual

Rationale. When patients treated with PD or HHD must leave their home, their potential risk of COVID-19 exposure is increased. This must be balanced against concerns about reducing the frequency of health care team global assessments, commonly undertaken procedures, examinations, and laboratory tests. Delaying formal kinetic studies and the other monitoring described above is unlikely to have negative health consequences in the short-term. All laboratories should be following local policies that minimize risk of COVID-19 including handwashing, PPE, and physical distancing; we considered that the risks of visiting them for blood tests was not prohibitive, but high enough that this risk should be minimized in those who are stable. For acute medical problems, whether suspected COVID-19 or intercurrent issues, if circumstances permit, the involvement of the home dialysis unit team may lead to more efficient use of emergency room resources, and routing of the patient to the emergency room currently best able to manage both their need for dialysis and their need for health care for the intercurrent problem.

7. Assisted PD Coverage in the Community

- 7.1. We suggest that assisted PD coverage continue to be offered to patients already in the program to reduce

conversion to in-center HD and prevent visits to the hospital.

- 7.2. We suggest rapid training of willing family members who may have been previously unavailable to provide assistance to decrease the number of visits by health care providers.
- 7.3. For programs that are dependent on third party agencies, we suggest open and frequent communication to verify staffing levels and services that can be realistically provided
- 7.4. We recommend that the above suggestions with respect to screening (pre-visit phone calls), hand hygiene, and PPE be followed as they would for hospital staff: visiting health care workers should call and confirm that there are no new respiratory symptoms or exposures, before entering the home.
- 7.5. If the hospital healthcare workforce responsible for assisted PD becomes overwhelmed secondary to reductions in staff numbers, we suggest the following strategies: (1) liaising with home and community care providers to discuss utilizing their staff to help facilitate assisted PD (will require rapid training of care providers) (2) actively reach out to family members for rapid training if this has not already been done (3) consider alternate day PD in some cases with the following patient stratification based on prescription and residual kidney function (RKF) as follows:
 - Nocturnal intermittent peritoneal dialysis (NIPD) and good RKF ($>3\text{ mL/min}$), consider alternate day cycling (consider 16-hour cycling on alternating days)
 - NIPD and poor RKF (estimated $<3\text{ mL/min}$), consider alternate day cycling (consider 18 hour cycling on alternating days)
 - CCPD and poor RKF (estimated $<3\text{ mL/min}$) significant risk of complication with alternate day cycling (only as last resort, consider 18 hours on alternating days)
 - We suggest 2 weeks as the initial period, followed by reassessment of the patients clinical condition and the resources available.
- 7.6. We suggest that units be prepared to bring some PD patients to the home dialysis unit in case of technique, supply, or support failure, and that in-center intermittent peritoneal dialysis (IPD) be considered if resources permit, and favored over conversion to HD.

Rationale. We outline some strategies designed to keep people dialyzing at home in times of resource constraint, arguing that if the system is stressed to the point that insufficient health care providers are available to maintain current standards, likely trained health-care workers will be a constrained

resource across the system, and that under these circumstances, the benefits of staying home with a dialysis prescription that might normally be considered suboptimal, outweigh the risks of transfer to other modalities.

Limitations

Because of limited time and resources, no attempt was made to do a systematic review of the literature but rather to focus on the questions posed within the Canadian senior renal leaders community of practice and others. The recommendations are based predominately on expert opinion and subject to the usual biases associated with this form of evidence. We have also 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 commiserate with risk.

Implications

These recommendations 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 recommendations. As part of our knowledge translation strategy, the manuscript will be hosted on the CSN website. Members of the CSN, Canadian Association of Nephrology Nurses and Technologists (CANNT), and the Canadian Association of Nephrology Administrators (CANA) will receive an email to this effect. The preliminary results were already shared with these groups during a CSN hosted webinar on April 11, 2020.

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