



PROVINCIAL STANDARDS & GUIDELINES



Best Practices: Kidney Care Clinics

Created 2014; Updated 2019
Approved by the BC Kidney Care Committee



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IMPORTANT INFORMATION

This BC Renal guideline/resource was developed to support equitable, best practice care for patients with chronic kidney disease living in BC. The guideline/resource promotes standardized practices and is intended to assist renal programs in providing care that is reflected in quality patient outcome measurements. Based on the best information available at the time of publication, this guideline/resource relies on evidence and avoids opinion-based statements where possible; refer to www.bcrenalagency.ca for the most recent version.

For information about the use and referencing of BC Renal guidelines/resources, refer to <http://bit.ly/28SFr4n>.



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1.0 Background & purpose of document

- Chronic kidney disease (CKD) has been recognized as a prevalent chronic disease. In BC, approximately 10% of the population has been estimated to have chronic kidney disease (BC Renal website, 2017). Similar or higher rates have been noted in the literature for the United States (13%; (Coresh J et al., 2007)), Australia (16% (Chadban, SJ et al, 2003)) and world-wide (8% - 16%; (Vivekanand, 2013)) (Note: figures are not comparable as the definition of chronic kidney disease is not standardized).
- Early identification and care is thought to be cost effective to (1) delay progression of CKD; and (2) optimize the management of co-morbidities such as cardiovascular disease. (BCMA & MOH, 2014). The awareness and knowledge about CKD amongst primary care providers has increased significantly in recent years.
- Interprofessional CKD programs are predicated on the idea that the combination of skills offered to patients will improve outcomes for both patients and the system. Studies have shown that interprofessional CKD care results in: (Johns, T et al., 2015) (Wu, 2009) (Hemmelgarn, 2007) (Curtis, BM et al, 2005) (Levin, A, 1997) (Goldstein, M et al, 2004)
 - Greater likelihood of starting dialysis on a home-based therapy. In BC, 40% of Kidney Care Clinic (KCC) patients who started on dialysis between Oct 1, 2016 and March 31, 2017 started on a home-based therapy. This percentage has been increasing over time.
 - Greater likelihood of starting dialysis with a fistula, if hemodialysis (HD) is chosen. In BC, 31% of KCC patients who started hemodialysis between Oct 1, 2016 and March 31, 2017 started with a fistula or graft. This percentage has remained relatively stable over time.
- Significantly fewer urgent dialysis starts.
- Fewer hospital days in the first months of dialysis.
- Improved survival once on dialysis.
- CKD programs provide repeated, regular, inter-professional team visits for patients with a chronic condition. In a BC patient experience survey of KCC patients, 92% of respondents rated the overall quality of kidney services to be “excellent” (42%), “very good” (33%) or “good” (17%) (2,909/9,669 patients) (BC Renal, 2017).
- A Renal Resource Management Model (RRMM) for CKD programs was developed in 2003/04 in collaboration with service providers across health authority renal programs. The RRMM was rolled out across BC by BC Renal (BCR) in 2005/06. BCR provides funding to health authorities (HAs) on a cost per patient basis for patients registered in PROMIS. As of 2017, there are 10,941 CKD patients managed in 13 CKD clinics in BC. This compares to 5,748 patients in 2007, representing a doubling of the numbers during the ten-year period.

Historically, patient exposure and experience in their CKD care has varied across BC CKD programs, including the physical location (clinic/office/both) and with whom the patient interacts (physician only/CKD team). The establishment of the Provincial Kidney Care Clinic (KCC) Committee in 2012 and the subsequent development of provincial guidelines, resources and tools has facilitated adoption of “best practices” and standardization of care across Kidney Care Clinics in BC.

The purpose of this document is to utilize the expertise and experience within BC, in combination with the CKD literature, to describe the role of Kidney Care Clinics (KCCs) in supporting “best practices” in the provision of CKD care. Refer to the companion document “*Best Practices: Care of Patients with Autosomal Dominant Polycystic Kidney Disease (ADPKD)*” (www.bcrenalagency.ca) for variations in practice and considerations specific to the care of ADPKD patients.

2.0 Kidney Care Clinic goals

Considerations

- Methods to identify patients with CKD have improved (reporting of eGFR and testing for proteinuria); therefore, more patients are being identified with CKD and at earlier stages.
- There is an abundance of literature which highlights the complications and adverse outcomes associated with CKD.
- There is a reasonable amount of literature that demonstrates that early identification and appropriate management of CKD (especially cardiovascular risks) reduces these adverse consequences and delays disease progression¹; this creates pressure on the health care system to identify and collectively provide appropriate care for patients with CKD.
- There is growing awareness and knowledge about CKD amongst primary care providers. This knowledge is supported by the availability of evidence-based CKD guidelines and education.
- Most patients with CKD will not progress to later stage kidney disease² and can be appropriately managed by their primary care provider +/- consultation with a nephrologist and access to education about kidney disease and chronic disease

management.

- A small proportion of patients with CKD, however, will progress to later stage kidney disease and/or be at significant risk of progression. These patients are the most likely to benefit from the services of an interprofessional team and are the primary focus of KCCs.
- Predicting those that will progress to later stage kidney disease and/or are at significant risk of progression and, therefore, most likely to benefit from KCC services, is a challenge. While prognostic tools are available (e.g., the Kidney Failure Risk Equation at <https://kidneyfailurerisk.com>), they are more relevant for service planning at a population level and less helpful for service planning for individual patients. This paper utilizes the KDIGO guidelines (Kidney Disease: Improving Global Outcomes (KDIGO) CKD Work Group, 2013) as a guide to identify this patient group.

¹This assumption has not been proven in appropriately powered randomized trials.

²Only 1% of people with CKD will require dialysis and/or kidney transplantation (Kidney Disease: Improving Global Outcomes (KDIGO) CKD Work Group, 2013)

Target population

The **target population** for Kidney Care Clinics is patients with later stage CKD and/or CKD which is likely to progress rapidly and their families.

Goals

KCCs work collaboratively with patients who are **living with complex kidney diseases, later stage CKD and/or at risk of rapidly progressing CKD** and their families to provide evidence-based, interprofessional care which aims to:

1. Provide specific therapy based on diagnosis to slow/arrest CKD progression.
2. Prevent, evaluate and/or manage:
 - a. Cardiovascular disease.
 - b. CKD endocrine and metabolic complications (e.g. malnutrition, anaemia, bone disease, acidosis).
 - c. Other co-morbid conditions.
3. Maximize the confidence and abilities of patients and their families to:
 - a. Adjust to and self-manage their disease and psychosocial factors.
 - b. Actively participate in and optimize treatment decisions and planning.
4. Support planning and preparation for:
 - a. Pre-emptive transplantation
 - b. Choice of modality
 1. Modality selection
 2. Orientation to modality
 3. Access placement
 - c. Advance care planning.
 - d. Conservative care and palliative care options where required.

3.0 KCC referral and repatriation to primary care criteria

3.1 Referral criteria

Patients are referred to KCCs by a nephrologist (see [Appendix 1](#) for KDIGO recommendations for referral from primary care to a nephrologist). *Considerations* by the nephrologist in the decision to refer to a KCC include:

1. Medical conditions including:
 - a. Recurrent or extensive nephrolithiasis.
 - b. Polycystic kidney disease.
 - c. Recurrent acute kidney injury.
 - d. Glomerular disorders.
2. GFR 30 – 60 mL/min/1.73 m² and:
 - a. Albuminuria (see [Appendix 2](#) for KDIGO prognostic categories based on GFR and albuminuria)
 - b. Patient at nutrition risk or with metabolic abnormalities thought secondary to their kidney disease.
 - c. Patient has apparent barriers to self-management that require the support of the interprofessional team in order to manage their kidney disease and related complications. Barriers may include language, low literacy, mental health issues and/or other social determinants of health.
3. GFR <30 mL/min/1.73 m².

Source: Adapted from (Kidney Disease: Improving Global Outcomes (KDIGO) CKD Work Group, 2013).

3.2 Criteria for repatriation to nephrologist/primary care

Patients who may no longer require KCC support and may be appropriate to discharge back to their nephrologist/primary care provider (PCP) include patients who:

1. Have a GFR ≥ 30 mL/min/1.73m² and have had slow to no GFR progression over at least a one year period (e.g., change in GFR < 3 mL/min/1.73m² per year) AND have no worrisome predictors of progression (e.g., albuminuria).
2. Have opted for conservative treatment, have a care plan and the nephrologist/PCP and the patient are comfortable in the arrangements for ongoing care.

Considerations prior to discharge from clinic:

- Availability of physician to receive/manage patient after discharge (GP or nephrologist).
- Written discharge plan provided to patient.

Note: If required at a later date, the patient may be re-referred to the clinic (by the nephrologist).

4.0 Target waiting times

KCCs are expected to have a mechanism in place and the capacity to see referrals designated as “urgent.” Guidelines for target time from receiving the referral to first appointment are as follows:

- If GFR < 15 mL/min/1.73 m², ability to see in less than 2 weeks.
- If GFR 15 – 20 mL/min/1.73 m², ability to see within 2 – 4 weeks.
- If GFR > 20 mL/min/1.73 m², ability to see within 4 – 6 weeks.

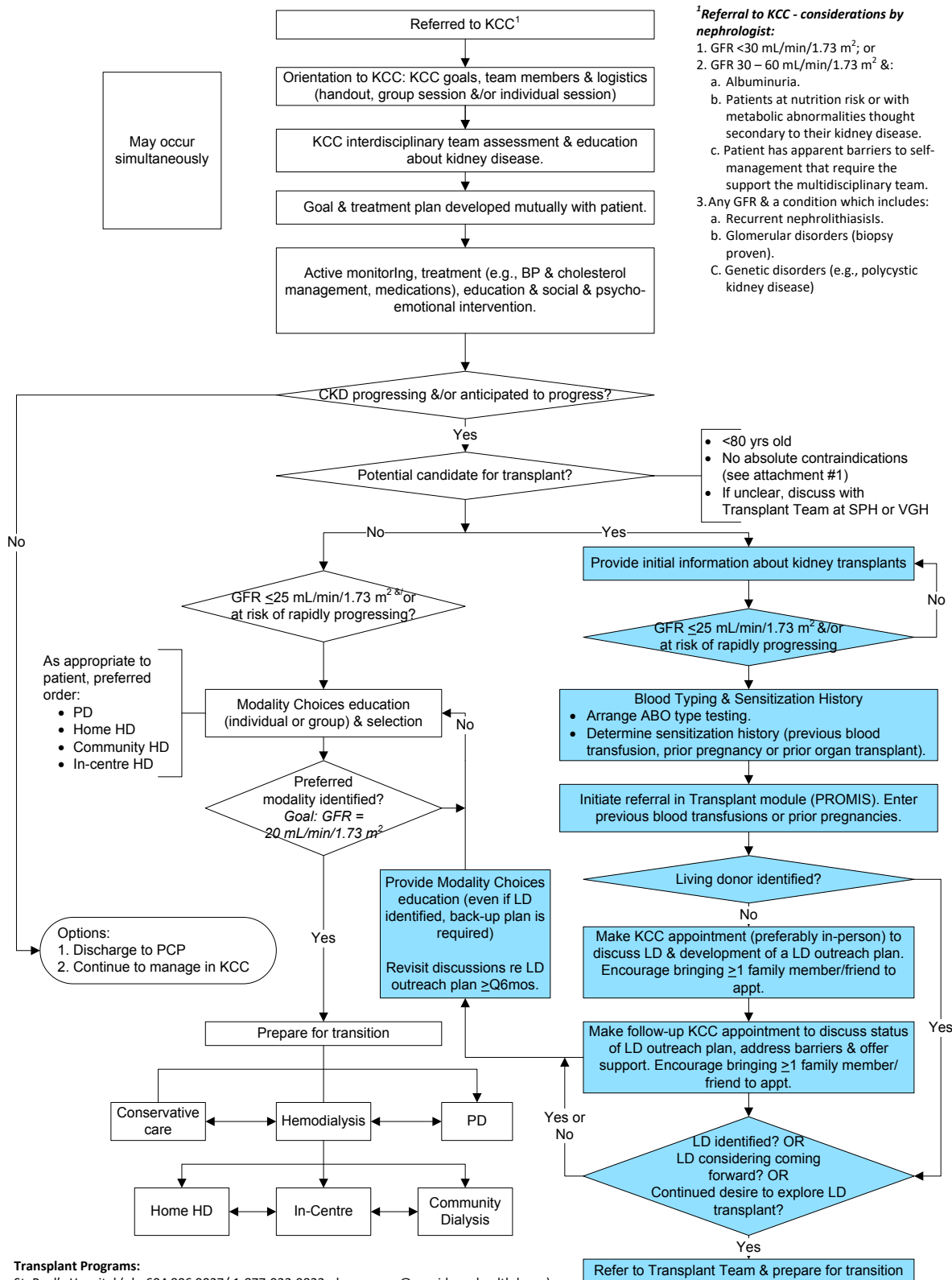
It is recognized that waiting times may be impacted by patient’s schedule, coordination with other appointments and education.

5.0 Tasks and timelines

5.1 KCC patient flow algorithm

The algorithm in Table 1 outlines the major tasks and timelines involved from receipt of KCC referral through to transition to a renal replacement therapy or conservative care.

Table 1: KCC Patient Flow Algorithm



5.2 KCC milestones

The major milestones for patients referred to KCC and their families include:

- Referral to KCC.
- Orientation to KCC.
- KCC team assessment, education about kidney disease and mutual goal-setting and treatment planning with patient.
- Active monitoring, treatment and social/psychological intervention.
- Modality option education and selection.
- Transition to preferred modality.

5.2.1 Referral to KCC

The form used to refer patients from the nephrologist to KCCs is clinic-specific. Suggested components for inclusion on the referral form:

- Demographics.
- Primary renal diagnosis (utilizing most common renal diagnoses in PROMIS classification - see [Appendix 3](#)).
- Renal function (GFR and degree of proteinuria).
- Mechanism to identify patients with conditions such as recurrent nephrolithiasis, glomerular disorders and genetic disorders (e.g., polycystic kidney disease).
- Co-morbidities which include, at a minimum, those required for the CORR data checklist:
 - Angina
 - Anxiety/depression
 - Cerebrovascular accident
 - Chronic obstructive lung disease
 - Congestive heart failure
 - Coronary revascularization (CABG)
 - Current smoker (history/packs per day)
 - Diabetes
 - Hypertension
 - Malignancy
 - Myocardial infarction

- Peripheral vascular disease
- Primary renal disease
- Transient ischemic attack
- Urgency (as per target waiting times in [Section 4.0](#)).
- Treatment modality, if known; if HD, provide option to refer for vascular access.
- Communication barriers/language/interpreter required.
- Orders for medications, vaccinations and laboratory tests.

Include a notation to attach consult letters/clinical summaries, updated medication list and relevant laboratory and diagnostic tests with the referral.

5.2.2 Orientation to KCC

Orientation to KCC includes information to the patient and their families on KCC goals, KCC programs and services, KCC team roles and logistics (clinic hours, appointment times).

Information may be provided in a variety of ways, such as:

- A written handout/letter that is given/mailed to the patient.
- Group session (some KCCs also include education on basic kidney education at this session).
- Individual session (some KCCs combine this with the initial KCC team assessment appointment).

5.2.3 KCC team assessment, education, goal-setting & treatment planning

KCC team assessment:

The KCC team assessment is an integrated assessment incorporating the perspectives of all KCC team members: physician, RN, dietitian, social worker and pharmacist.

*Education about the earlier phases of kidney disease*³:

Education about kidney disease may be covered in a variety of ways, including education session (individual or group), discussed as part of a KCC team appointment(s) and written materials. Education is best phased-in over time.

Suggested elements to include:

- Provide copy and review the concepts contained in Book #1 of *Living with Reduced Kidney Function* (The Kidney Foundation of Canada). <https://kidney.ca/book-one-living-with-reduced-kidney-function>
 - Introduction
 - Chapter 1—How your kidneys work
 - Chapter 2—Kidney disease
 - Chapter 3—How you can support your kidney health
 - Chapter 4 – Managing your medications for kidney health
 - Chapter 5 – Your diet and nutrition for kidney health
 - Chapter 6 – Living well with reduced kidney function
 - Chapter 7—Developing a personal care plan of action
 - Chapter 8—If your kidneys fail
- Hepatitis screening and appropriate timing and resources for vaccinations.
- Medications: review BCR pamphlets on *Non-Prescription Medications and Your Kidneys and Medication Changes When You are Sick* at [www.bcrenalagency.ca/health-info/managing-my-care/chronic-kidney-disease-\(ckd\)](http://www.bcrenalagency.ca/health-info/managing-my-care/chronic-kidney-disease-(ckd))
- Laboratory work, the meaning of test results and how to obtain copies of results: review BCR pamphlet on *Get to Know Your Kidney Lab Work* at [www.bcrenalagency.ca/health-info/managing-my-care/chronic-kidney-disease-\(ckd\)](http://www.bcrenalagency.ca/health-info/managing-my-care/chronic-kidney-disease-(ckd))
- Introduction to the concept of advance care planning.
- Smoking cessation.
- BC resources: review *Kidney Care Clinic: Useful Internet Sites for Patients* at [www.bcrenalagency.ca/health-info/managing-my-care/chronic-kidney-disease-\(ckd\)](http://www.bcrenalagency.ca/health-info/managing-my-care/chronic-kidney-disease-(ckd))
- Vein preservation: review key points and provide bracelet and wallet card at www.bcrenalagency.ca/health-professionals/clinical-resources/vascular-access.

Goal-setting and treatment planning:

Goal-setting and treatment planning are important components of kidney care. When done in collaboration with patients/patient's family (best practice), goal setting and treatment planning supports patients in the self-management of their kidney disease.

Important concepts to teach patients/families in relation to goal-setting/treatment planning/self-management include:

- What is self-management? Why is it important?
- What is goal-setting and treatment planning? How can they support self-management?
- Information about the stages of change and the relationship to setting and achieving goals.
- How to set goals. e.g., blood pressure, physical activity, eating, smoking, quality of life.
- How to develop an action plan to meet goals: breakdown into a series of small steps and identify barriers and ways to overcome those barriers. Assess self-confidence in ability to meet goals and discuss ways that will make the goals seem more achievable.
- Review community resources that will help to support meeting goals.

³ See section 5.2.5 for education related to modality options (for those in the later phases of kidney disease).

5.2.4 Active monitoring, treatment and psychological/social support

Frequency of KCC visits (in-person or telehealth)

[Table 2](#) provides guidelines for the frequency of KCC visits based on the severity and stability of the patient's kidney disease. Other factors in determining visit frequency include:

- Geographic distance to KCC.
- Ability of patient to self-manage.
- Patient care needs and preferences.
- Nephrologist practice (some nephrologists see patients in their offices between KCC visits).

Table 1: Guidelines for Frequency of KCC Visits based on Severity and Stability of Kidney Disease (in-person or via telehealth)

CKD	Visit Frequency
Stable G3a (45-59 mL/min)	Annually
Stable G3b (30-44 mL/min)	Q6mo
Stable G4 (15-29 mL/min)	Q3mo
G5 (<15 mL/min)	Q2mo

KCC treatment protocols/guidelines

See individual guidelines ([http://www.bcrenalagency.ca/health-professionals/clinical-resources/chronic-kidney-disease-\(ckd\)](http://www.bcrenalagency.ca/health-professionals/clinical-resources/chronic-kidney-disease-(ckd))) for:

- Symptom assessment and management
- Conservative care pathway
- Depression and anxiety: the role of KCCs
- Ordering, reviewing and follow-up of lab work
- Medication reconciliation

5.2.5 Modality choices education and selection

Modality choices education focuses on treatment options that both optimize patient outcomes and incorporate patient choice (i.e., right treatment for the right patient at the right time).

Suggested elements to include:

- Provide copy and review contents of reference materials (see below)
- Refresher about the kidneys
- Making decisions re treatment options which consider both the medical and psychosocial context
- Placement on the continuum of kidney function
- Kidney treatment options: As appropriate to patient, preferred order:
 - Transplant (preferred treatment for most patients with kidney failure):
 - What is it? What are the options (living vs deceased donor)? What are the benefits? What are the points to consider?
 - If transplantation is the treatment option selected, a back-up plan for dialysis is required even if a living donor has been identified.
 - PD: What is PD? What are the benefits? What are the points to consider?
 - Home HD: What is HHD? What are the benefits? What are the points to consider? What are the options for vascular access?
 - Facility-based HD (Community & In-centre HD): What is facility-based HD? What are the benefits? What are the points to consider? What are the options for vascular access?
 - Conservative care: What is conservative care? What are the benefits? What are the points to consider?

For patients /families, the decision-making process is often a difficult one and they may change their decision over time. Staff/physician support for the

decision-making process is important for a successful transition. Support includes acknowledgement and exploration of patient/family concerns, needs, fears, anxieties and barriers as well as providing adequate time to make decisions, and allowing pt/family autonomy while balancing the tasks of renal care planning.

Reference materials:

- Book #2 of *Living with Kidney Failure* (The Kidney Foundation of Canada). <https://www.kidney.ca/manual>
- BCR Modality Choices Education. [http://www.bcrenalagency.ca/health-professionals/clinical-resources/chronic-kidney-disease-\(ckd\)](http://www.bcrenalagency.ca/health-professionals/clinical-resources/chronic-kidney-disease-(ckd))
- BCR Dialysis Options in BC: A guide to making the treatment choice that is right for you. http://www.bcrenalagency.ca/resource-gallery/Documents/Dialysis%20Options%20in%20BC%20March%202013_WEB.pdf.

5.2.6 Transition to selected modality

Kidney failure creates the need for many transitions for patients, including preparation for renal replacement therapy or shifting to conservative care. Each change can cause stress and fear for patients/families who do not know how their day-to-day lives will change or how they will respond to the new treatment/regime. Changes that seem routine for KCC staff may be highly stressful for patients/families. Understanding the experience from the patient/family perspective is important, as is helping patients/families understand what to expect. Patients/families need to know how and who to ask for help and how to be engaged in the process. Clear, coordinated communication with patients/families and between providers is key to a successful transition (Forum of ESRD Networks' Medical Advisory Council, 2017).

Detailed transition guides for the care team and for patients are available at www.bcrenalagency.ca:

- Transition to Kidney Transplant
- Transition to Peritoneal Dialysis
- Transition to Home Hemodialysis/Independent Hemodialysis
- Transition to Hemodialysis

5.3 KCC team member roles

Shared Team Functions

- Prioritizes intake of new referrals, with consideration to nephrologist input provided on the referral.
- Collaborates with patients/families in developing self-management plans, goal setting and treatment planning related to CKD guidelines.
- In support of continuity of care, communicates discipline-specific information, care plans and concerns to physician(s) and other health care team members and services who are involved with the patient (e.g., Diabetes Education Centre, Heart Health, Acute Care).
- Communicates patient/family-specific information to appropriate modality team when transitioning to PD, HD or transplant.
- Refers patients to other health care professionals/services as needed. e.g., Diabetes Education Centre, Heart Health, Home Care.
- Acts as a resource to other health professionals in the area of chronic kidney disease and related treatments/supports.
- Assessment of non-active patients re suitability for discharge from the KCC.
- Participates in program planning and quality improvement activities.
- Educates peers, students and other learners about chronic kidney disease.

Registered Nurse

Assessment and care planning:

- Assesses health condition, symptoms, diagnosis and medications.
- Reviews the CORR data checklist completed by referring nephrologist/NP at time of KCC referral. Enters into PROMIS if not done by NP and/or Unit Coordinator (Unit Clerk).
- Monitors fluid status, skin integrity and blood pressure.
- Monitors lab results and follows-up as per BCR protocols. e.g., anemia, declining eGFR.
- If fistula in place, monitors status.
- If pharmacist not available (best practice is that these functions be done by a pharmacist):
 - Updates the patient's medication list at each KCC visit based on the best possible medication history.
 - Ensures currency of PROMIS medication profile after each clinic visit.
- Follows up with patient/family post-modality education (to support decision making). If requested by the kidney care team, follows up with patient/family after relevant medication changes and post-hospital admissions.
- Completes appropriate nursing care planning as indicated.
- Initiates discussions and educates patients/families about advance care planning [Shared role with SW and nephrologist/NP].
- Reviews patient chart after each clinic visit to ensure all orders have been processed completely and accurately.

Patient/family education (individual and/or group):

- Educates patients/families about nursing-specific aspects of kidney disease and its implications: normal kidney function, blood tests, causes, symptoms and complications of kidney disease and indications for kidney transplant/dialysis.
- Educates patients/families about treatment

options and, along with Social Work, supports patients in modality and end-of-life decision-making.

- Assesses and provides education to patients/families on the evaluation and management of symptoms.
- Educates patients/families about recommended timing of hepatitis, influenza and pneumococcal vaccinations and refers to appropriate resource for follow-up.

Preparation for renal replacement modality:

- Reviews treatment choice and readiness for transition regularly.
- Assists with initiating referral for/coordinates:
 - If PD, referral to PD team and PD tube insertion.
 - If HD, referral to VA Clinic and home HD team (if home HD) or HD unit (if facility-based HD).
 - If transplant, referral to transplant team and selection of back-up dialysis option.
 - If conservative care, ongoing assessment and monitoring, education about symptom control and management. Works with SW to initiate referrals to home care and palliative care as appropriate.

Registered Dietitian

Assessment and care planning:

- Assesses nutritional status, including an initial and ongoing review and analysis of medical and diet history, lab values and anthropometric measurements.
- Addresses signs and symptoms related to oral intake and nutritional status; reviews protein/potassium/phosphorus, sodium, lipids and other pertinent nutrients.
- Reviews vitamins and minerals and makes recommendations based on nutritional status, lab values and stage of CKD.
- Recommends appropriate therapeutic diet(s) and

establishes a diet plan.

- Evaluates diet plan through clinic follow up and telephone.
- Conducts regular dietary reviews and provides self-management support.
- Follows up abnormal lab results (as per BCR lab work guideline) and answers questions.
- Prescribes nutrition supplements as part of provincial nutritional supplement program to prevent muscle wasting and further weight loss.
- Identifies potentially harmful herbal products [Shared role with Pharmacy].
- Collaborates with Nephrologist and Pharmacist to optimize bone health.
- Seeks out and liaises with, if necessary, the services of a Home and Community Care Dietitian and/or a Dietitian in assisted living or long-term care or inpatient dietitian.
- Refers patients, families and caregivers to appropriate resources to assist in coping with diet/related concerns. This may include recommendations to various meal programs.
- Responds to patient, family and caregivers' potential or expressed food security. As appropriate and necessary, prepares and completes a letter on behalf of the patient to apply for a nutrition or diet supplement under the Provincial Nutrition Benefits Program.
- Responds to patient, family and caregivers' emotional/lifestyle adjustment issues re. therapeutic renal diet/CKD status in general. [Shared role with SW]

Patient/family education (individual and/or group):

- Educates and counsels patient/family on food choices and meal ideas. Individualizes education and counseling regarding CKD, diabetes, heart disease, weight loss, etc.
- Instructs on topics such as label reading, menu planning and phosphate additives.
- Reinforces appropriate use of medications including vitamins and minerals.

- Develops renal specific nutrition resources, as needed, based on a variety of factors which may include ethnicity, identified language barrier and education level.
- Provides nutrition resources based on the nutrition care plan, patient goals and stage of CKD.
- Uses ESAS scores and associated BCR algorithms to support nutritional care planning.

Preparation for renal replacement modality:

- Provides information and answers questions about how the renal diet may change depending on treatment choice.
- Ensures continuity of nutritional care if patients' renal care is transferred to another service area.

Registered Social Worker

Assessment and care planning

- Conducts initial and ongoing social work assessments - gathers/analyzes social and psycho-emotional data on patient/primary "support" system.
- Provides assessment, consultative and direct services related to psycho-emotional factors - cognitive decline, anxiety, depression, caregiver burden and other assessments that impact education, adaptation and decision making.
- Provides assessment/referrals for social determinants of health related to self-management of CKD- functional status, finances and housing situations.
- Assesses health literacy – interpretations/constructed meanings/implications.
- Provides therapeutic interventions - individual, couples and group related to emotional response to diagnosis, adjustment, traumatic stress, crisis and grief & loss.
- Advocates for patient and supports discussions between patient, patient's primary support and the health care team.
- Supports goals of care by enhancing problem-solving capacity and facilitating positive changes

in management styles with interventions related to behaviour, attitudes, and feelings that challenge self-efficacy.

- Facilitates meetings/care conferences - documents social work aspects of care plans.
- Fulfills mandates per Adult Guardianship Legislation, Mental Health, Child Protection, Freedom of Information and other relevant legislation as needed while managing complex patient/primary “support” situations.
- Refers beyond scope for further assessment/ services to family physician, mental health and community health programs, social agencies and government ministries.
- Supports team members in viewing patient’s behaviour through a psychosocial lens.
- Provides resource counselling for patients/families on services and benefits (e.g., medical insurance, medication coverage, transportation programs, death benefits to overcome barriers and address current/future needs).
- Provides information about support that might be available through The Kidney Foundation of Canada (short term financial assistance, interest-free loans, telephone-based peer support, LODERP, literature, etc).
- Fosters partnerships and helps patients/primary “supports” to develop partnership within the renal community, especially the Kidney Foundation, for the purposes of advocacy, self-advocacy and accessing programs that benefit renal patients/ primary “supports.”

Treatment Decisions

- Supports CKD patient education and provides patients/support/SDM with psycho-education and modality options ameliorating distress related to medical education.
- Actively participates with patient in advance care planning within their scope of practice.
- Engages patient/support in end-of-life care planning (conservative care decision making, end of

life plans and referrals or co-management).

Preparation for Transitions

- Reviews patient’s social and psycho-emotional readiness for transitions regularly and provides clinical counselling for patient/support system related to transitions.
- Ensures discipline specific transfer of information to strengthen continuity of care.

Pharmacy Services (Pharmacist +/- Registered Pharmacy Technician)

Assessment and care planning

- Completes initial medication history (pharmacist or pharmacy technician).
- Review patient’s allergies and intolerance to medications (pharmacist or pharmacy technician).
- Completes review of medications at each visit.
 - Reviews medications for renal dosage adjustments and drug interactions (pharmacist).
 - Helps to interpret drug levels (pharmacist).
 - Makes recommendations to nephrologist/ nurse practitioner to optimize treatment (e.g., blood pressure, glycemia, lipids, acidosis, gout, anemia, etc) (pharmacist).
 - Detects and resolves actual and potential drug therapy problems (pharmacist).
 - Ensures currency of PROMIS medication profile after each clinic visit (pharmacist or pharmacy technician).
- Where approved by the HA/KCC, manages the anemia or other approved protocols.
- Answers questions from family physicians, specialists and other care providers re appropriate pharmacological adjustments for patients with reduced kidney function (pharmacist).

Patient/family education

- Educates patients and their families about:
 - Their medications and reviews medication adherence (pharmacist).

- The local renal pharmacy and what medications are covered by BCR (pharmacist or pharmacy technician).
- Nephrotoxic medications to avoid and what to do when sick (refer to BCR hand out) (pharmacist).
- The use of over the counter medications, including herbals products (refer to BCR handout) (pharmacist).
- Provides ongoing medication education and support as needed (pharmacist).
- As requested, books and coordinates appointments with other clinics (including vascular access), consultants, diagnostics, and community resources and arranges mobile labs.
- Triage patient/family concerns with team. [Shared Role]
- Prepares patient chart for transfer to other renal programs (e.g., PD).
- Maintains clinic supplies and learning materials.

Nephrologist (+/- Nurse Practitioner)

Medication reconciliation & external linkages

- Conducts medication reconciliation as per the process and timing outlined in the BCR medication reconciliation guideline (may be completed by RN if no pharmacist available; best practice is for pharmacist to do).
- Liaises with community pharmacies if needed (pharmacist or pharmacy technician).
- Facilitates medication coverage with fair Pharmacare and private insurance plan (pharmacist or pharmacy technician).

Unit Coordinator (Unit Clerk)

- Establishes and maintains patient charts (e.g., files consults, lab work, etc).
- Admits and discharges patients in hospital system.
- Enters patients into PROMIS and inputs initial and ongoing data (e.g., labs, co-morbidities).
- Enters CORR data checklist into PROMIS (based on information provided by the RN and/or nephrologist/NP).
- Books patients for KCC appointments/education sessions. Sets up system for patient reminders.
- Assists team in preparing for clinic visits (e.g., obtains requested consults, books interpreters).
- Obtains and sorts blood work.
- Coordinates patient flow during KCC visits.
- Updates medications post clinic visit (entries validated by pharmacist or RN).

- Performs initial medical assessment.
- Assesses changes in medical condition of patients at each visit.
- Performs at least annual medical reassessment, including review of events/ hospitalizations.
- Actively participates with patient in advance care planning.
- Reinforces education efforts by team. Supports patients/families in decision-making.
- Determines protocol and frequency of lab testing and KCC visits.
- Follows-up abnormal laboratory results as per BCR lab work guideline.
- Reviews the patient's available treatment options and finalizes the plan for renal replacement therapy.
- Documents all communications in chart (dictated and/or written).

6.0 Recommended allocation of resources for KCCs

6.1 BCR CKD funding model

BCR provides funding to HAs to support CKD patients using an activity-based funding model. The funding model was developed several years ago and was intended to reflect to best CKD practices. It is included

in this paper for consideration by programs when assigning staffing allocations.

The amount of funding provided to a KCC depends on actual volumes for:

1. Numbers of new cases per year: \$424/case.
2. Numbers of cases discharged per year: \$115/case.
3. Numbers of cases maintained as CKD patients per year:
 - a. GFR >30 mL/min/1.73m²: \$556/case
 - b. GFR 15-30 mL/min/1.73m²: \$788/case
 - c. GFR <15 mL/min/1.73m²: \$1,525/case

The amount of funding provided for new, discharged and/or maintenance cases is based on the:

1. Tasks/activities required by patients under each case category (the intensity of medical care depends on renal function status).
2. Most appropriate type of staff to do each task.
3. Amount of time to complete each task.
4. Frequency of completing the task (e.g. every month, upon entry, upon discharge etc); and
5. Probability that the task will be required for the patient population.

New cases per year (\$424 and 6.5 staff hours per case) includes time for:

- Clerk to prepare file, enter information in computer, retrieve blood work, make appointment, order supplies and enter outside lab information into PROMIS.
- RN, SW, dietitian, pharmacist to introduce themselves and explain role in care and RN to discuss vaccinations.

Discharged cases (\$115 and 1.7 staff hours per case) includes time for:

- RN to orientate patient to treatment options and prepare for chosen option; if HD, follow-up after fistula at 2 and 8 weeks post creation.
- Clerk to complete referral and paperwork.
- If conservative treatment chosen, SW to arrange meetings with palliative care.

Maintenance cases includes time for:

- a. GFR >30 mL/min/1.73m² (\$556 and 8.5 staff hours per case):
 - 4 follow-up assessments per year by the RN, dietitian and pharmacist.
 - Time for the clerk to book follow-up appointments and arrange lab work and enter medications post-appointment.
 - 1 follow-up assessment per year by the SW.
 - Medication teaching and administration and organizing and following-up annual blood work by the RN.
- b. GFR 15-30 mL/min/1.73m² (\$788 and 11.7 staff hours per case):
 - Same as for GFR >30 mL/min/1.73m² except that time is provided for 6 follow-up assessments per year. The time per assessment provided for the dietitian and pharmacist is longer than for the patients with GFR >30 mL/min/1.73m².
- c. GFR <15 mL/min/1.73m² (\$1,525 and 22.1 staff hours per case):
 - Same as for GFR >30 mL/min/1.73m² except that time is provided for 12 follow-up assessments per year. The time per assessment provided for the RN is longer than for the patients with GFR >30 mL/min/1.73m².

In addition to the amounts for new, discharged and maintenance cases, there are block allocations of funds for specific functions (e.g., pharmacy time for medication reconciliation).

6.2 Application of the BCR CKD funding model

[Table 2](#) provides an example of BCR funded staffing levels if the funding model is applied to a large centre. [Table 3](#) provides similar information for a small centre. Both tables are calculated using the average provincial acuity level of: 51.65% under Category 1 (GFR >30); 35.85% under Category 2 (GFR 15-30) and 12.50% under Category 3 (<15).

Table 2: Application of the BCR CKD funding model to a large centre

Volume	Cases	Hrs/case/year						Hrs/year					
		Clerk	RD	Pharm	RN	SW	Total	Clerk	RD	Pharm	RN	SW	Total
New cases	468	1.25	2.5	0.52	0.56	1.70	6.53	585	1,170	243	262	796	3,056
Discharged cases	222	0.35			1.34		1.69	78	0	0	297	0	375
Maintenance cases													
GFR>30 mL/min	1,206	1.00	1.00	0.52	2.57	3.40	8.49	1,206	1,206	627	3,099	4,100	10,239
GFR15-30 mL/min	837	1.50	1.98	1.02	3.77	3.40	11.67	1,256	1,657	854	3,155	2,846	9,768
GFR<15 mL/min	292	3.00	3.00	1.55	11.17	3.40	22.12	876	876	453	3262	993	6,459
Total direct hours / year								4,000	4,909	2,177	10,076	8,735	29,897
Note⁴ A:													
Personal fatigue factor								1.15	1.15	1.00	1.15	1.15	
Indirect factor								1.45	1.35	2.18	1.35	1.20	
Paid factor								1.18	1.19	1.19	1.18	1.18	
Paid hr/FTE								1,872	1,879	1,879	1,872	1,879	
Staffing-Funded FTEs								4.20	4.82	3.01	9.86	7.56	29.46

Note: Figures exclude time for nephrologist.

⁴ Factors were developed to convert direct hours to worked hours that considered an allowance for personal fatigue and delay factors (1.15 times direct hours) and indirect time (typically in the range of 1.25 to 1.35 times direct hours, and sick, holiday, vacation and development time - typically 1.18 times worked hours).

Table 3: Application of the BCR CKD funding model to a small centre

Volume	Cases	Hrs/case/year						Hrs/year					
		Clerk	RD	Pharm	RN	SW	Total	Clerk	RD	Pharm	RN	SW	Total
New cases	79	1.25	2.50	0.52	0.56	1.70	6.53	93	185	38	42	126	483
Discharged cases	49	0.35			1.34		1.69	17			66		83
Maintenance cases													
GFR>30 mL/min	174	1.00	1.00	0.52	2.57	3.40	8.49	174	174	90	447	592	1,476
GFR15-30 mL/min	150	1.50	1.98	1.02	3.77	3.40	11.67	225	297	153	565	510	1,750
GFR<15 mL/min	41	3.00	3.00	1.55	11.17	3.40	22.12	123	123	64	158	139	907
Total direct hours / year								632	779	345	1,577	1,367	4,699
Note A:													
Personal fatigue factor								1.15	1.15	1.00	1.15	1.15	
Indirect factor								1.45	1.35	2.18	1.35	1.20	
Paid factor								1.18	1.19	1.19	1.18	1.18	
Paid hr/FTE								1,872	1,879	1,879	1,872	1,879	
Staffing-Funded FTEs								0.66	0.76	0.48	1.54	1.18	4.63

Note: Figures exclude time for nephrologist.

⁴ Factors were developed to convert direct hours to worked hours that considered an allowance for personal fatigue and delay factors (1.15 times direct hours) and indirect time (typically in the range of 1.25 to 1.35 times direct hours, and sick, holiday, vacation and development time - typically 1.18 times worked hours).

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Appendix 1: Referrals to Nephrology from Primary Care based on GFR and Albuminuria

KDIGO recommends that primary care physicians refer patients to a nephrologist in the following circumstances (Kidney Disease: Improving Global Outcomes (KDIGO) CKD Work Group, 2013):

1. People with CKD in the following circumstances (evidence grade 1B except where noted):
 - AKI or abrupt sustained fall in GFR.
 - GFR <30 ml/min/1.73 m² (GFR categories G4-G5)⁵.
 - A consistent finding of significant albuminuria (ACR >300 mg/g [>30 mg/mmol] or AER >300 mg/24 hours, approximately equivalent to PCR >500 mg/g [>50 mg/mmol] or PER >500 mg/24 hours).
 - Progression of CKD based on one or more of the following (not graded):
 - Decline in GFR category (>90 [G1], 60-89 [G2], 45-59 [G3a], 30-44 [G3b], 15-29 [G4], <15 [G5] ml/min/1.73 m²). A certain drop in eGFR is defined as a drop in GFR category accompanied by a 25% or greater drop in eGFR from baseline.
 - Rapid progression is defined as a sustained decline in eGFR of more than 5 ml/min/1.73 m²/year.
 - The confidence in assessing progression is increased with increasing number of serum creatinine measurements and duration of follow-up.
 - Urinary red cell casts, RBC >20 per high power field sustained and not readily explained.
 - CKD and hypertension refractory to treatment with 4 or more antihypertensive

agents.

- Persistent abnormalities of serum potassium.
 - Recurrent or extensive nephrolithiasis.
 - Hereditary kidney disease.
2. Planning renal replacement therapy (RRT) in people with progressive CKD in whom the risk of kidney failure within 1 year is 10-20% or higher⁶, as determined by validated risk prediction tools (evidence grade 1B). See Appendix 1a for referral recommendations based on albuminuria and GFR status.

⁵ If this is a stable isolated finding, formal referral (i.e., formal consultation and ongoing care management) may not be necessary and advice from specialist services may be all that is required to facilitate best care for the patients. This will be health-care system dependent.

⁶ The aim is to avoid late referral, defined here as referral to specialist services less than 1 year before start of RRT.

Appendix 1a: Recommendations for Referral to Nephrology from Primary Care

				Persistent Albuminuria Categories: Description and Range		
				A1	A2	A3
				Normal to mildly increased	Moderately increased	Severely increased
				<30 mg/g <3 mg/mmol	30-300 mg/g 3-30 mg/mmol	greater than 300 mg/g greater than 30 mg/mmol
GFR categories (ml/min/1.73m ²) Description and Range	G1	Normal or high	greater than or equal to 90		Monitor	Refer*
	G2	Mildly decreased	60-89		Monitor	Refer*
	G3a	Mildly to moderately decreased	45-59	Monitor	Monitor	Refer
	G3b	Moderately to severely decreased	30-44	Monitor	Monitor	Refer
	G4	Severely decreased	15-29	Refer*	Refer*	Refer
	G5	Kidney failure	less than 15	Refer	Refer	Refer

- low risk (if no other markers of kidney disease, no CKD)
- moderately increased risk
- high risk
- very high risk

* Referring clinicians may wish to discuss with their nephrology service depending on local arrangements regarding monitoring or referring.

Source: Kidney Disease: Improving Global Outcomes (KDIGO) CKD Work Group, 2013

Appendix 2: Prognosis of CKD by GFR and Albuminuria Category (KDIGO 2012)

Prognosis of CKD by GFR and Albuminuria Categories: KDIGO 2012				Persistent Albuminuria Categories: Description and Range		
				A1	A2	A3
				Normal to mildly increased	Moderately increased	Severely increased
				less than 30 mg/g less than 3 mg/mmol	30-300 mg/g 3-30 mg/mmol	greater than 300 mg/g greater than 30 mg/mmol
GFR categories (ml/min/1.73m ²) Description and Range	G1	Normal or high	greater than or equal to 90	low risk	moderately increased risk	high risk
	G2	Mildly decreased	60-89	low risk	moderately increased risk	high risk
	G3a	Mildly to moderately decreased	45-59	moderately increased risk	high risk	very high risk
	G3b	Moderately to severely decreased	30-44	high risk	very high risk	very high risk
	G4	Severely decreased	15-29	very high risk	very high risk	very high risk
	G5	Kidney failure	less than 15	very high risk	very high risk	very high risk

- low risk (if no other markers of kidney disease, no CKD)
- moderately increased risk
- high risk
- very high risk

Source: Kidney Disease: Improving Global Outcomes (KDIGO) CKD Work Group, 2013

Appendix 3: Primary Renal Diagnosis (utilizing PROMIS classification)

DIAGNOSIS LEGEND

Glomerulonephritis/Autoimmune Diagnosis	
05	Mesangial proliferative GN
06	Minimal lesion GN
07	Post-strep GN
08	Rapidly Progressive GN
09	Focal glomerulosclerosis - Adult
10	Glomerulonephritis - No histology
11	Severe nephrotic syndrome with focal sclerosis - Pediatrics
12	IgA Nephropathy - proven by IF
13	Dense deposit - proven by IF (MPGN type II)
14	Membranous nephropathy
15	Membranoproliferative mesangio capillary GN (MPGN type I)
16	Idiopathic crescent glomerulonephritis (diffuse proliferative)
17	Congenital nephrosis or congenital nephrotic syndrome - Pediatric ONLY
19	Glomerulonephritis, histologically examined - specify
73	Polyarteritis
74	Wegner's granulomatosis - Granulomatosis with polyangiitis (GPA)
84	Lupus erythematosus
85	Henoch-Schonlein Purpura
86	Goodpasture Syndrome
87	Scleroderma
88	Hemolytic uremic syndrome
Nephropathy, Drug Induced	
30	Nephropathy caused by drugs or nephrotoxic agents, not specified
31	Nephropathy due to analgesic drugs
32	Nephropathy due to cisplatin
33	Nephropathy due to cyclosporin A
39	Nephropathy caused by other specific drug - Specify drug
Polycystic Kidney	
41	Polycystic Kidneys - Adult (dominant)
42	Polycystic Kidneys - Infant & Juvenile (recessive)
Diabetes	
80	Diabetic nephropathy - Type 1
81	Diabetic nephropathy - Type 2
Congenital/Hereditary Renal Disease	
21	Pyelonephritis/interstitial nephritis assoc w/ neurogenic bladder
22	Pyelonephritis/interstitial nephritis due to congenital obstructive uropathy w/ or w/o vesicoureteric reflux
24	Pyelonephritis/interstitial nephritis due to vesicoureteric reflux without obstruction
40	Cystic kidney disease - type unspecified
43	Medullary cystic disease, including nephronophthisis
49	Cystic kidney disease, other type, Specify
50	Hereditary familial nephropathy, type specified
51	Hereditary nephritis with nerve deafness (ALPORT Syndrome)
52	Cystinosis
53	Oxalosis
54	Fabry disease
55	DRASH syndrome

58	Posterior urethral valves
59	Hereditary nephropathy, other - specify
60	Congenital renal hypoplasia - specify
61	Oligomeganephronic hypoplasia
62	Segmental renal hypoplasia (Ask-Upmark kidney)
63	Congenital renal dysplasia with or without urinary tract malformation
66	Syndrome of agnesesis of abdominal muscles (Prune-belly syndrome)
Renal Vascular Disease	
70	Renal vascular disease, type unspecified
71	Malignant hypertension (no primary renal disease)
72	Renal vascular disease due to hypertension (no primary renal disease)
73	Polyarteritis nodosa
78	Atheroembolic renal disease
79	Renal vascular disease, classified (nephrosclerosis, renal vascular thrombosis)
Other	
20	Pyelonephritis/interstitial nephritis, cause not specified
23	Pyelonephritis/interstitial nephritis due to acquired obstructive uropathy - specify
25	Pyelonephritis/interstitial nephritis due to urolithiasis
29	Pyelonephritis, other causes
56	Sickle cell nephropathy
57	Wilms Tumor
82	Multiple myeloma
83	Amyloid
89	Multi-system disease, other - specify
90	Cortical or acute tubular necrosis
91	Tuberculosis
92	Gout
93	Nephrocalcinosis and hypercalcemic nephropathy
94	Balkan nephropathy
95	Kidney tumor
96	Traumatic or surgical loss of kidney
97	HIV Nephropathy
99	Other identified renal disorders - specify

Most Common Renal Diagnoses	
09	Focal Glomerulosclerosis - Adults
12	IgA Nephropathy
20	Pyelonephritis/Interstitial Nephritis
41	PCKD
72	Hypertension
80	Type 1 Diabetes
81	Type 2 Diabetes
84	Lupus Erythematosus
90	Acute Tubular Necrosis (ATN)
96	Traumatic or Surgical Loss of Kidney

Modality education and identification of preferred modality:

1. For patients with progressive chronic kidney disease who are potential candidates for a transplant, the Kidney Care Clinic (KCC) team provides initial information about kidney transplantation (patients <80 yrs old with no absolute contraindications).
2. Kidney Care Clinic (KCC) team initiates discussions with the patient about modality options when the patient's GFR is 20-25 mL/min and/or at risk of rapidly progressing. Goal is to have a preferred modality identified at a GFR of 20 mL/min.
3. Modality options include transplant, peritoneal dialysis (PD), hemodialysis (HD; dependent or independent) and conservative care. Inclusion and exclusion criteria for different modalities and delivery methods are determined by each modality team.
4. The focus of the modality discussion is on modalities appropriate to the patient's circumstances.
5. If the patient meets the inclusion criteria, options are presented in the following order:
 - a. Transplant (transplant prior to dialysis start is preferred)
 - b. Independent dialysis: PD, then HHD.
 - c. Dependent hemodialysis:
 - i. Patients are expected to go to a community dialysis unit (CDU) once stable after initial run(s) in an in-centre unit. Another option is nocturnal dialysis (if available).
 - ii. Patients unsuitable to move to a CDU will dialyze in an in-centre hemodialysis unit.
6. If the preferred modality is transplant:
 - g. Patients are supported in developing a Living Donor Outreach Plan.
 - h. If a KCC patient, patient is asked to select a dialysis option as back-up.
7. Regardless of the setting of the patient, there are processes in place within each HA to regularly review the eligibility of patients for transplant and independent modalities/settings. Where appropri-

ate, transplantation and/or transition to independent modalities is encouraged (e.g., if patient is on HD and is appropriate for PD, transition to PD is encouraged; if a patient is dialyzing in an in-centre unit and is appropriate for HHD or a CDU, transition to HHD or CDU is encouraged).

Provision of ongoing care up to the point of transfer to modality:

8. KCC/modality team (e.g., PD, HHD, HD), actively monitors, treats and provides physical care and psychosocial support up to the point of hand-off to the receiving transplant/modality team.
9. KCC/modality team (e.g., PD, HHD, HD) advises the receiving transplant/modality team of significant changes in the patient status. Receiving transplant/modality team reassesses suitability of the patient for the planned transplant/modality.

Decision to start modality (not required if conservative care chosen):

10. The patient, nephrologist, KCC/modality team (e.g., PD, HHD, HD) and receiving modality team jointly determine the appropriate modality start date.

Preparation for transition once the modality date is known:

11. KCC/modality team (e.g., PD, HHD, HD) prepare patient for tests/consults/procedures (incl access creation) prior to transition to receiving modality, if required.
12. KCC/modality team (e.g., PD, HHD, HD) prepares and forwards a current patient summary to the receiving modality team and a "handover" summary to the patient's primary care provider.
13. KCC/modality team (e.g., PD, HHD, HD) makes arrangements to cancel services no longer required post transition to the new modality (e.g., standing lab orders, mobile lab to home, etc).
14. Responsibility for care is transitioned as follows:
 - a. Transitioning to PD: Responsibility for care

- transfers to the PD team on the first day of PD.
- b. Transitioning to HHD: Responsibility for care transfers to the HHD team on the first day of home HD training.
 - c. Transitioning to facility-based HD: Responsibility for care transfers to the HD team on the first day of dialysis.
 - d. Transplantation:
 - i. Responsibility for care transfers to the Transplant Team (St Paul's, Vancouver General Hospital) on the day of the transplant.
 - ii. Responsibility for care transfers from the Transplant Team (St Paul's or Vancouver General Hospital) to the Regional Transplant Centre upon discharge of the patient from the Transplant Team (usually at ~ three months post-transplant).
 - e. If conservative care, care may continue to be provided by KCC/modality team or the patient may be discharged to their primary care provider.

Detailed guides for providers outlining the steps of transition from KCCs to transplant, PD, HD, Home HD and conservative care are available at: www.bcrenalagency.ca. Companion guides for patients are available at: www.bcrenalagency.ca