Identification, Evaluation and Management of Patients with Chronic Kidney Disease

Scope

The first part of this guideline provides recommendations for the investigation and management of adult patients at risk of, and those diagnosed with, chronic kidney disease (CKD). The second part of the guideline describes care objectives for patients with CKD, focusing on approaches, interpretations of tests, and systems that should be in place to improve the likelihood that appropriate, evidence-based care is provided.

Part 1: Investigation of patients at risk for kidney disease

Recommendation 1: Identify high-risk populations

Identify patients at risk of kidney disease based upon a directed medical and surgical history including comorbidities (e.g. diabetes, cardiovascular disease), as well as dietary, social, demographic, and cultural factors, a review of symptoms, and physical examination.

High-risk populations include those:
- with diabetes
- with a diagnosis of hypertension +/- cardiovascular disease
- with a family history of kidney disease
- belonging to specific high-risk ethnic groups: First Nations and Pacific Islanders.

Note: Age greater than 60 years is associated with an increased risk of impaired kidney function. However, there is insufficient evidence at this point to recommend screening all individuals over 60 solely on the basis of age.

Recommendation 2: Screen high-risk populations

Screen high-risk populations every 1-2 years depending upon clinical circumstances (e.g. yearly for persons with diabetes) using serum creatinine and random urine tests (see below for details).

The estimated Glomerular Filtration Rate (eGFR), computed from the **serum creatinine** value, is the best laboratory marker for kidney disease. Most laboratories in BC now automatically report eGFR when a serum creatinine is ordered. (See Calculating eGFR Conversion Table.)
- **Persistent eGFR values < 60 mL/min indicate substantial reduction in kidney function.**
- Urine test abnormalities, even with persistent eGFR values ≥ 60 ml/min, indicate abnormal kidney function, either as an isolated condition or as a symptom of a systemic disease.

Random urine tests for macroscopic and microscopic urinalysis and albumin/creatinine ratio (ACR)

- Significant abnormalities include the presence of persistent white blood cells or red blood cells in the absence of infection or instrumentation. The presence of any cellular casts is always pathological.
- Elevation of ACR (> 2.0 mg/mmol males; > 2.8 mg/mmol females) on 2 out of 3 serial tests, performed between 1 week and 2 months apart, indicates micro-vascular disease +/- glomerular disease.

If test results are normal, repeat every 1-2 years and monitor blood pressure. If test results are abnormal, confirm the abnormality, then evaluate as described in Recommendation 3.

Notes:

1. "Persistent" = present for > 3 months.
2. GFR estimates based on serum creatinine measurements may be unreliable in patients with very large or small body habitus, those on specific diets (very high or very low protein) and in patients receiving medications that interfere with the measurement or excretion of creatinine (e.g. trimethoprim and sulfamethoxazole, ciprofloxacin, fenofibrate).
3. 24-hour urine collections are not necessary in most cases.
4. ACR is also referred to as the test for microalbumin. "Microalbuminuria" refers to urinary albumin excretion above the normal range, but below the detection limit of tests for urinary total protein. Note that this guideline uses the thresholds adopted by the Canadian Diabetes Association for the detection of microalbuminuria. As methods improve and further data become available, these cutoffs may be revised. Serial ACR tests can normally be incorporated into the routine visit schedule.
5. Exercise, diet and/or hydration status may affect kidney function estimates or the degree of albuminuria/proteinuria. If baseline tests are abnormal or subsequent tests are significantly different from baseline, confirmation by repeat testing is warranted.

Recommendation 3: Evaluate patients with abnormal screening test results*

Kidney damage is defined as pathologic abnormalities or markers of damage, including abnormalities in blood or urine tests or imaging studies. Chronic kidney disease is defined as either kidney damage or GFR < 60 mL/min for ≥ 3 months.

If chronic kidney disease is present, determine the stage of CKD based on eGFR, urinalysis and ACR. The following staging system,[1] designed by the National Kidney Foundation (US) with international input, is recommended to facilitate assessment and management of kidney disease.

* In the absence of other systemic illness (see Table 1, Recommendation 4).

Stage	Description	eGFR (ml/min)	Complications
1	Kidney damage with normal or ↑ GFR	≥ 90	
2	Kidney damage with mild ↓ GFR	60-89	• Concentration of parathyroid hormone starts to rise • Hypertension possible
3	Moderate ↓ GFR	30-59	• Decreased calcium absorption • Reduced phosphate excretion • Hyperparathyroidism common • Lipoprotein activity falls • Malnutrition potential • Onset of left-ventricular hypertrophy • Onset of anemia, including functional iron deficiency • Hypertension
4	Severe ↓ GFR	15-29	• Triglyceride concentration starts to rise • Hyperphosphatemia • Malnutrition • Metabolic acidosis • Tendency to hyperkalemia • Hypertension
5	Kidney failure	< 15 or dialysis	• Azotemia develops • Heart failure/volume overload • Hypertension

Patient management should reflect both stage and results of urinalysis and ACR testing as summarized in Table 1.

Table 1. Recommendations for managing patients with abnormal screening tests*

Stage	Other Results	Recommendation
1 or 2	Urinalysis normal but ACR equivocal (2-20 M; 2.8-28 F) on at least 2 out of 3 occasions	• Follow Recommendations 4-7 • Consider kidney ultrasound** • Annual creatinine, urine tests. Refer to nephrologist/internist if urine protein increasing or eGFR declining > 10% annually
	Abnormal urinalysis or abnormal ACR (> 20 M; > 28 F)	• Follow Recommendations 4-7 • Refer to nephrologist or internist • Consider kidney ultrasound to identify kidney disease requiring urgent referral. • Consider referral to urologist for isolated microhematuria even if U/S normal
3	Urinalysis normal or equivocal ACR (2-20 M; 2.8-28 F)	• Follow Recommendations 4-7 • Consider kidney ultrasound • Creatinine, urine tests q 6 months • Refer to nephrologist/internist if urine protein increasing or eGFR declining > 10% annually.
	Abnormal urinalysis or abnormal ACR (> 20 M; > 28 F)	• Follow Recommendations 4-7 • Kidney ultrasound • Refer to nephrologist/internist
4	Regardless of other results	• Follow Recommendations 4-7 • Refer to nephrologist/internist
5	Regardless of other results	• Follow Recommendations 4-7 • **Urgent** referral to nephrologist/internist

* In the absence of other systemic illness (see Recommendation 4 below).

** Kidney ultrasound may be required in those with a family history of polycystic kidney disease, or symptoms of urinary tract obstruction, infection or stones. It can also quickly identify reversible conditions.

ACR indicates albumin/creatinine ratio; eGFR, estimated glomerular filtration rate.

Recommendation 4: Determine the cause of kidney disease

A primary cause of kidney disease should be determined in all patients if possible; impaired kidney function is often multifactorial. Kidney ultrasound is a useful examination to identify polycystic kidney disease, cancer, stones, and obstruction, as well as to screen for clinically significant renal artery stenosis. Furthermore, kidney disease can be the first or most dramatic presentation of a severe systemic illness.

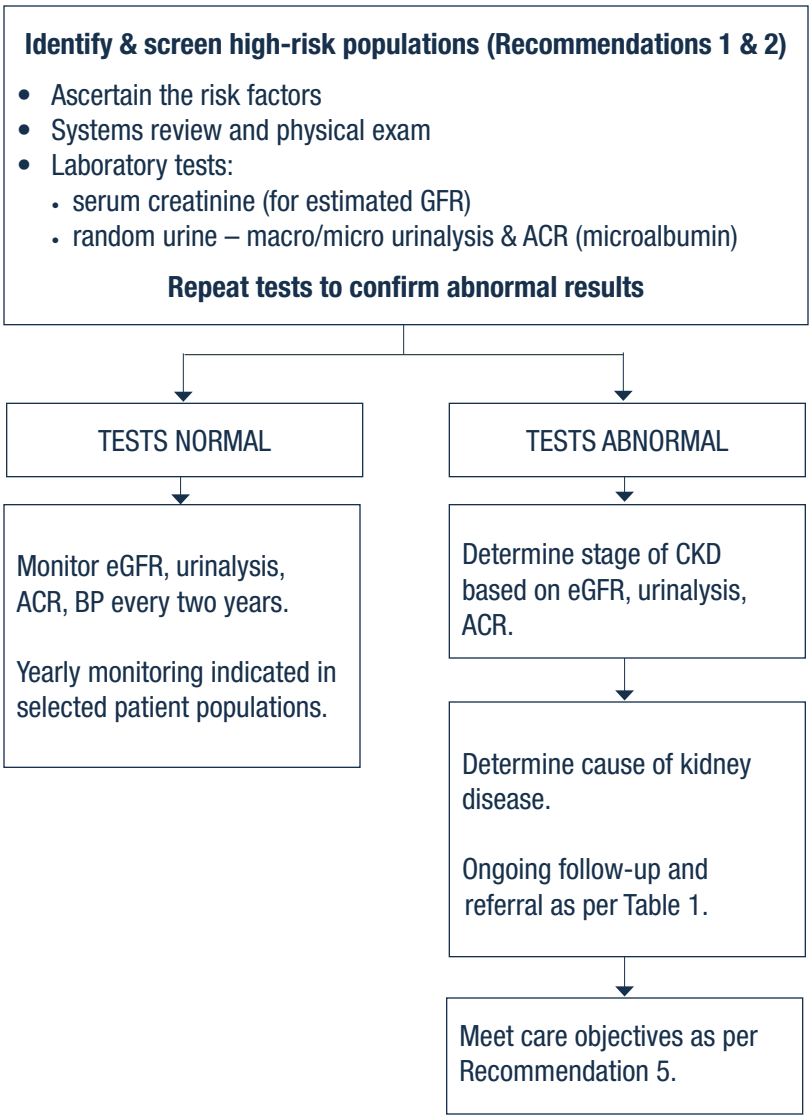
Even if a primary cause seems obvious, the possibility of a serious underlying cause like vasculitis, lupus or other conditions must be considered in patients with:

- abnormal urinalysis (proteinuria, hematuria, cellular casts or combination thereof)
- rapid decline in kidney function (Δ GFR > 10%/year)
- repeated impairment of kidney function even in the absence of risk factors
- constitutional symptoms suggesting systemic illness
- sudden or severe onset of symptoms (e.g. edema unrelated to heart disease or liver disease).

Refer to a specialist for further evaluation if etiology cannot be determined (See Table 1).

Note: Occasionally a screening test will identify a serious systemic disease or early stage of an acute illness. In those patients with active urine sediments (RBC casts, cellular casts ± protein), constitutional symptoms or unexplained severity of kidney dysfunction, prompt consultation with a specialist and/or re-evaluation of tests is indicated.

Figure 1. Evaluation and Management of Suspected Kidney Disease



RECOMMENDATION 5: Identify care objectives

Identify care objectives for all patients with CKD In your practice. Depending on the level of kidney function and complexity of therapy required, these care objectives may be more or less difficult to achieve without help from a specialized team of health care professionals, including a nephrologist. Treatment goals must therefore be tailored to the individual.

Care	Objective	Target
Blood pressure	Measure and record at diagnosis and at every visit thereafter. See *Treatment of Essential Hypertension* guideline.	• BP less than 130/80 • Use of ACEI/ARB recommended in addition to other drugs*
Kidney function measurements	Obtain regular measurements of serum creatinine for estimates of GFR (at least q 6 mths) and after any change in medications, medical interventions or clinical status.	Stability of kidney function or < 10% decline in GFR annually
Urine testing	ACR (microalbumin) regularly (at least q 6 mths)	• Reduce abnormal values by 50% or more from baseline • Use of ACEI/ARBs recommended*
Cardiovascular disease risk assessment Lipid profiles	Calculate & record cardiovascular risk and manage in accordance with relevant guidelines. Check fasting lipids yearly once target values achieved, more frequently in patients on lipid lowering medication.	Reduction of risk Lipid targets: LDL < 2.5 Ratio (TC/HDL) < 4.0
Assessment of conditions associated with CKD	Measure hematology profile, mineral metabolism, and nutrition profiles at least yearly, more frequently with advanced kidney disease.	• Hgb > 120 g/L • Transferrin saturation > 20% • Calcium > 2.2 mmol/L • Phosphorus < 1.4 mmol/L • iPTH in normal range • Albumin in normal range
Diabetes: blood glucose control over time	Measure A1C every 3 months. See *Diabetes Care* guideline.	A1C: ≤ 7.0% (0.07)
Weight and nutrition	Record weight & BMI on each visit for comparison.	Maintenance of adequate nutrition and BMI near ideal (18.5-24.9)†
Smoking	Encourage patient to stop; enquire at every visit; support when receptive.	Complete cessation
Hepatitis B screening	Identify seronegative patients; offer vaccination.	Seroconversion, prevention of Hepatitis B (Seroconversion rate higher if immunized early)
Influenza vaccine	Immunize annually.	Prevention of influenza
Pneumococcal vaccine	Immunize every 10 years.	Prevention of pneumonia
Limit exposure to nephrotoxins	Reduce risk of acute or chronic deterioration of kidney function.	Avoidance of aminoglycosides, NSAIDs, COX-2 inhibitors, intra-venous or intra-arterial radiocontrast studies
Psychosocial health	Identify depression and grief reaction often associated with chronic disease. Identify and address psychosocial problems that affect the illness.	Support for patient. Optimizing patient ability to self-manage chronic illness

* Reduction of proteinuria can be facilitated by the use of ACEI/ARBs. This has been shown to reduce the rate of progression of chronic renal insufficiency in hypertensive patients with diabetes or chronic glomerulonephritis.
† In patients with severe kidney disease (GFR < 15ml/min), weight loss may indicate a catabolic state and possibly the need for dialysis.

ACEI indicates angiotensin-converting enzyme inhibitors; ARB, angiotensin II receptor blockers; GFR, glomerular filtration rate; ACR, albumin/creatinine ratio; LDL, low-density lipoprotein; TC, total cholesterol; HDL, high-density lipoprotein; Hgb, hemoglobin: iPTH, intact parathyroid hormone; A1C indicates glycated hemoglobin (previously referred to as HbA1C); BMI, body mass index; NSAIDs, non-steroidal anti-inflammatory drugs; COX-2 inhibitors, cyclooxygenase –2 inhibitors.

Practice Points:

When setting goals with your patient, consider the following:

1. Exercise, diet and/or hydration status may affect kidney function estimates or the degree of albuminuria/proteinuria. If baseline tests are abnormal or subsequent tests are significantly different from baseline, confirmation by repeat testing is warranted.
2. Rigorous control of blood pressure has been shown to reduce the risk of complications and mortality rates. In particular, the inhibition of the renin angiotensin system with ACE inhibitors or ARBs has been shown to be very effective. Diuretics, ß-blockers and/or calcium channel blockers may also be required since most patients require more than two medications to reach target values. See *Treatment of Essential Hypertension* guideline.
3. Every adult with kidney disease is at high to very high risk of cardiovascular disease.
4. Nephrotoxic medication (e.g. NSAIDs, COX-2 inhibitors, aminoglycosides) should be avoided or used with caution in patients with even mild kidney impairment (eGFR 60-90 ml/min), and kidney function should be monitored if they are used.
5. Intra-venous or intra-arterial radiocontrast use poses a high risk of acute kidney failure in CKD patients with Stage 4 or 5 CKD and a moderate risk in patients with Stage 3 disease.[2] If imaging is required, alternate imaging techniques, including MRI angiography, should be considered for these patients. If no alternative exists and the procedure is medically necessary, the patient should give written informed consent and protection with IV hydration and N-acetyl cysteine should be used according to a published protocol.
6. Review medication list, identify those excreted by the kidneys and dose adjust as appropriate.[3] Examples include metformin, digoxin and lithium (see Physician's Resource section).
7. Rapid deterioration in kidney function (a decline of eGFR >10% annually) warrants urgent referral to a nephrologist or internist.
8. Preparation for kidney replacement treatment requires a minimum of 12 months. Referral for consideration of kidney replacement should take this into account.
9. Many patients with CKD also have diabetes and/or heart disease. Explaining the linkage between these conditions and how treating one condition benefits others may lessen the psychological impact of several separate diagnoses.

Recommendation 6: Support patient self-management

People with kidney disease have better outcomes if they take an active role in the management of their own condition, and should be encouraged to do so. Denial, often associated with grief reaction, is common in patients with chronic disease affecting a vital organ. Efforts to introduce preventive lifestyle and medical therapy may fail until understanding and acceptance have been achieved. CKD care teams are skilled at dealing with this issue. To support patient self-management, the physician should:

- Support patients through the process of accepting the diagnosis of a chronic illness.
- Ensure that patients understand the implications of the diagnosis and their role in self-management.
- Help patients identify a support team.

- Involve patients in defining the best possible goals for care, including lifestyle modifications such as smoking cessation, healthy diets, weight management, exercise, and social support.
- Encourage patients to monitor their own progress through the use of diaries or logbooks to track clinical values, and self-monitor blood pressure (and blood glucose where appropriate).
- Reinforce lifestyle modifications at each visit.
- Explain and discuss the results of investigations and consultations.
- Identify community resources that can provide patients with the information, skills and support needed to understand and manage their condition, and direct or refer patients to those resources. (Note: Patient self-management resources are listed in *Chronic Kidney Disease: A Guide for Patients* and are available from the Chronic Disease Management web site at: www.healthservices.gov.bc.ca/cdm/patients).

Recommendation 7: Meet care objectives

The care of CKD patients is very similar to care of any patient with a chronic illness; thus similar principles should be applied. Evidence indicates that the care of chronic diseases such as CKD can be improved by the implementation of regular scheduled reviews of clinical and laboratory parameters. Physicians are encouraged to:

- Create a patient register to identify all patients with impaired kidney function in their practice.
- Participate in a community or provincial patient register wherever possible.
- Use a flow sheet for each patient with kidney disease. (See Appendix 1 for sample flow sheet.)
- Use an organized recall system to ensure that laboratory investigations and subsequent office reviews are performed at regularly scheduled appropriate intervals.
- Review patient records to ensure care objectives are met.

Rationale

Chronic kidney disease is a serious population health problem with significant impacts on individuals, families, society and health services. It is often associated with other common chronic diseases such as diabetes, hypertension and heart disease. Because many cases are undiagnosed, the true prevalence of CKD is substantially underestimated. Based on population studies, the estimated prevalence of significant kidney impairment (glomerular filtration rate (GFR) < 60 ml/min) in British Columbia is 145,000 people, approaching the prevalence of Type II diabetes. Chronic kidney disease increases the risk of cardiac morbidity and mortality to levels ten times that of population mean risk, in addition to placing persons at risk of end stage renal disease requiring dialysis.[4-6] Recent studies have demonstrated that the presence of impaired kidney function portends a worse prognosis both in terms of hospital stay and in terms of morbidity and mortality.[7-9] Thus, while not all people with kidney disease will require dialysis, they are all at higher risk for poor outcomes, adverse reactions to medications and interventions, and are at risk for episodes of acute kidney failure.[8,10-12]

The outcome of patients who go on to dialysis remains poor, with 10% mortality per year, and an overall 5-year survival rate that is worse than that of all cancers except lung cancer.[13,14] Evidence clearly indicates that efforts to control hypertension and proteinuria (and hyperglycemia in persons with diabetes) can prevent or postpone the development of progressive kidney function decline.[15-22] However, levels of care for milder stages of kidney disease remain suboptimal and practitioners often do not provide screening and management in accordance with published guidelines.[23-28]

This guideline outlines strategies which may help the primary care practitioner meet the complex needs of persons with chronic kidney disease including accurate and timely diagnosis of the etiology of the kidney disease, and appropriate management of common factors affecting progression and comorbid conditions.

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Guidelines and Protocols Advisory Committee
1515 Blanshard Street 2-3
Victoria BC V8W 3C8
Phone: (250) 952-1347
Fax: (250) 952-1417
E-mail: hlth.guidelines@gems6.gov.bc.ca
Web site: www.healthservices.gov.bc.ca/msp/protoguides

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- to encourage appropriate responses to common medical situations
- to recommend actions that are sufficient and efficient, neither excessive nor deficient
- to permit exceptions when justified by clinical circumstances.

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Calculating eGFR: Conversion Table

The MDRD and Cockcroft-Gault equations used to calculate GFR are available at www.kidney.org.

S-Creatinine to GFR Conversion Table

For those physicians whose laboratories are not yet able to calculate eGFR, the following tables provide approximate eGFR values by gender. Values have been calculated using the MDRD calculation (Levey et al. *Ann Intern Med* 1999;130:461-70) and should be considered approximate only. Note that 'normal' eGFR = 100-120ml/min/1.73 m^2. The use of the equation or table below, does not require a 24 hour urine sample collection.

Stage 1 > 90 ml/min with abnormalities on UA or US
Stage 2 = 60 – 89 ml/min with abnormalities on UA or US
Stage 3 = 30 – 59 ml/min
Stage 4 = 15 – 30 ml/min
Stage 5 = <15 ml/min

Women	Age					
S-Creatinine	20-39	40-49	50-59	60-69	70-79	≥80
40 – 49	173	163	156	150	146	142
50 – 59	134	126	121	116	113	110
60 – 69	108	102	98	94	91	89
70 – 79	91	86	82	79	76	74
80 – 89	78	73	70	68	65	64
90 – 99	68	64	61	59	57	56
100 – 109	60	57	54	52	51	49
110 – 119	54	51	49	47	45	44
120 – 129	49	46	44	42	41	40
130 – 139	44	42	40	39	37	36
140 – 149	41	38	37	35	34	33
150 – 159	38	36	34	33	32	31
160 – 169	35	33	31	30	29	29
170 – 179	33	31	29	28	27	27
180 – 189	30	29	27	26	26	25
190 – 199	29	27	26	25	24	23
200 – 209	27	25	24	23	23	22
210 – 219	26	24	23	22	21	21
220 – 229	24	23	22	21	20	20
230 – 239	23	22	21	20	19	19
240 – 249	22	21	20	19	18	18
250 – 259	21	20	19	18	18	17
260 – 269	20	19	18	17	17	16
270 – 279	19	18	17	17	16	16
280 – 289	18	17	17	16	15	15
290 – 299		18	17	16	15	15

Stage 1 > 90 ml/min with abnormalities on UA or US
Stage 2 = 60 – 89 ml/min with abnormalities on UA or US
Stage 3 = 30 – 59 ml/min
Stage 4 = 15 – 30 ml/min

Men	Age					
S-Creatinine	20-39	40-49	50-59	60-69	70-79	≥80
40 – 49	233	220	210	203	196	191
50 – 59	180	170	162	157	152	146
60 – 69	146	138	132	127	123	120
70 – 79	122	115	110	106	103	100
80 – 89	105	99	94	91	88	86
90 – 99	91	86	82	79	77	75
100 – 109	81	76	73	70	68	66
110 – 119	73	68	65	63	61	59
120 – 129	66	62	59	57	55	54
130 – 139	60	56	54	52	50	49
140 – 149	55	52	50	48	46	45
150 – 159	51	48	46	44	43	42
160 – 169	47	44	42	41	40	39
170 – 179	44	41	40	38	37	36
180 – 189	41	39	37	36	35	34
190 – 199	39	36	35	34	33	32
200 – 209	36	34	33	32	31	30
210 – 219	34	32	31	30	29	28
220 – 229	33	31	29	28	27	27
230 – 239	31	29	28	27	26	25
240 – 249	29	28	27	26	25	24
250 – 259	28	27	25	24	24	23
260 – 269	27	25	24	23	23	22
270 – 279	26	24	23	22	22	21
280 – 289	25	23	22	21	21	20
290 – 299		24	22	21	21	20

BCHealthServices

BRITISH COLUMBIA MEDICAL ASSOCIATION

BC Renal Agency
An Agency of the Provincial Health Services Authority

THE KIDNEY FOUNDATION OF CANADA

PROVINCIAL Health Services AUTHORITY

CHRONIC KIDNEY DISEASE PATIENT FLOW SHEET

NAME OF PATIENT		PHN
DATE OF BIRTH	DATE OF DIAGNOSIS	COMORBIDITIES

Type of kidney disease (please ✔):
- ☐ Diabetes
- ☐ Hypertension
- ☐ Polycystic KD
- ☐ Other (indicate) : _____

REMINDERS

MORE KIDNEY-SPECIFIC EDUCATION?	☐ Y	☐ N
REGULAR BLOOD WORK SCHEDULE ESTABLISHED?	☐ Y	☐ N
REFERRED TO A NEPHROLOGY TEAM?	☐ Y	☐ N
REGULAR VISITS ESTABLISHED?	☐ Y	☐ N

NOTES:

IMMUNIZATION

	YYYY MM DD
DATE OF LAST INFLUENZA	
DATE OF LAST PNEUMONIA	
DATE OF LAST HEPATITIS B	

VALUE	BP	WEIGHT BMI	sCr & eGFR	Δ GFR	ACR	A1C	LIPID PROFILE		ANEMIA		MINERAL METABOLISM			FOLLOW-UP ISSUES
TARGET/ FREQUENCY:	<130/80 Every visit	Stable BMI: 18.5-24.9 Every visit	Stable At least 6 mos	<10% annual decline	≥50% reduction from baseline At least 6 mos	≤ 7.0% Every 3 mos	LDL <2.5 At least annually	Ratio < 4.0 At least annually	Hgb >120 At least annually	TSAT >20% At least annually	Calcium >2.2 At least annually	Phosphorus < 1.4 At least annually	iPTH & albumin in normal range At least annally	
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MEDICATION					
NAME OF DRUG	DOSE	FREQUENCY	PRESCRIBED BY	START DATE	STOP DATE
1.					
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Chronic Kidney Disease

Physician Resources

Location	Hospital	Clinic Name	Phone Number
Kamloops	RIH	Kidney Clinic	250 314-2849
Kelowna	KGH	Renal Health Clinic	250 862-4300 ext 3386
New Westminster	RCH	Chronic Kidney Disease Clinic	604 520-4985
Penticton	PRH	Renal Health Clinic	250 492-4000 ext 7560
Prince George	PGRH	Outpatient Renal Clinic	250 565-2747
Trail	KBRH	CKD Clinic	250 364-3450
Vancouver	St. Paul's	Kidney Function Clinic	604 806-9025
Vancouver	VGH	Renal Clinic	604 875-4111 ext 5598
Victoria	RJH	Kidney Care Clinic	250 370-8224

BC Provincial Renal Agency (BCPRA)
Rm 620-16, 6th Floor, Burrard Building
1081 Burrard Street
Vancouver, BC V6Z 1Y6

Tel: 604 806-8845
Fax: 604 806-8846
Email: bcpra@cheos.ubc.ca

The BC Provincial Renal Agency is a collaborative of renal health professionals who coordinate the care of patients with kidney disease in BC.

Kidney Foundation of Canada (BC Branch)
320 1600 West 6th Avenue
Vancouver, BC V6J 1R3
www.kidney.bc.ca
Email: info@kidneyfoundation.bc.ca

604 736-9775 (Vancouver area)
1 800 567-8112 (elsewhere in BC)
Fax: 604 736-9703

The Kidney Foundation provides educational materials related to various aspects of kidney disease and treatment and offers a number of patient services. The Foundation has facilitated educational sessions on chronic kidney disease for family physicians. For more information please refer to the web site or contact the BC Branch.

National Kidney Foundation (USA)
The National Kidney Foundation web site, www.kidney.org, includes a section for health care professionals as well as on-line access to the K/DOQI guidelines.

Further information on nephrotoxic drugs
Kappel J, Calisi P, Morton AR. Nephrology: 3. Safe drug prescribing for patients with renal insufficiency. *CMAJ* 2002; 166(4): 473-477.
www.merck.com/pubs/mmanual/section17/chapter226/226a.htm
www.fpnotebook.com/REN99.htm

Chronic Kidney Disease

A Guide for Patients

What is chronic kidney disease (CKD)?

Kidneys are as important to your health as your heart or your lungs. Shaped like kidney beans and about the size of your fist, your kidneys are located on either side of your spine under the lower ribs. Their main task is to remove waste products from your blood. Your kidneys also produce important hormones that regulate some of your body's functions and help balance water and minerals in your body.

Chronic kidney disease (CKD) refers to a medical condition where your kidneys' ability to filter wastes from your body is impaired. CKD usually starts slowly and progresses over a number of years. If diagnosed and treated early, CKD may be slowed down or stopped. However, if it keeps getting worse, CKD may lead to kidney failure, also called End-Stage Renal Disease (ESRD). If you have ESRD, treatment options include dialysis or a kidney transplant. These treatments can help you stay healthy and continue your daily activities.

There is no cure for CKD – the goal of treatment is to keep the kidneys functioning as long as possible by detecting and treating the disease at its early stages. Sometimes, if treated early, all that may be needed is a change in your diet, control of your blood pressure and/or some specific medication.

What are the symptoms of kidney disease?

CKD is a silent disease. Most people do not have any symptoms in the early stages. Symptoms begin when most of your kidney function is lost. Symptoms that may show up as your kidney function deteriorates include frequent headaches, fatigue, and itching all over the body.

As kidney disease worsens, the body is unable to get rid of waste products and excess water. This condition is called uremia. In addition to earlier symptoms, you may experience:

- Frequent urination or passing less urine
- Swelling in legs, ankles, feet, face, and/or hands
- Metallic or bad taste in mouth
- Nausea and vomiting
- Loss of appetite
- Shortness of breath
- Feeling cold
- Trouble concentrating, dizziness
- Leg pain/muscle cramps

Who is at risk of developing CKD?

The leading causes of kidney failure are **diabetes** and **high blood pressure**. These conditions interfere with the filtering ability of the kidneys and can lead to kidney failure. Early diagnosis and careful management of these conditions can delay and even prevent the onset of kidney failure. Talk to your doctor if you have diabetes or hypertension. Other factors that increase a person's risk of developing CKD include:

- Family history of kidney disease (e.g. polycystic kidney disease)
- Certain ethnic groups (First Nations, Pacific Islanders)
- Overuse of anti-inflammatory drugs and pain-killers
- Infection or injury to the kidneys (e.g. glomerulonephritis)

How can I prevent or control CKD?

There is no cure for CKD, but by learning more about your illness and taking an active part in managing your health you may be able to keep your kidneys functioning longer. Consider using the *Chronic Kidney Disease Patient Log* to monitor your progress. You can take this log with you when you visit your doctor. Other important things you can do include:

- **Control diabetes**
  If you have diabetes, keep your blood glucose levels as close to normal as possible. Along with taking your medications as prescribed, keep your weight under control and exercise regularly. Your doctor should routinely test whether your kidneys are functioning properly.

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THE KIDNEY FOUNDATION OF CANADA
BC Renal Agency
An Agency of the Provincial Health Services Authority
PROVINCIAL Health Services AUTHORITY
BCHealthServices

- **Control high blood pressure (hypertension)**
  High blood pressure causes kidney damage and will also cause kidney function to deteriorate more quickly. Control your high blood pressure to 130/80. Work with your doctor to find the anti-hypertension medications that work best for you. Keep your weight under control, exercise regularly, and reduce your salt intake to help keep your blood pressure at a healthy level.

- **Lead a smoke free life**
  To help prevent kidney disease, stop smoking and avoid exposure to second hand smoke.

- **Eat well**
  If you have CKD, it is important to have a diet that meets your nutritional needs. Learn how proper food choices can help you. Talk to a nutritionist or dietician about a food plan that is right for you. Be aware that certain foods can cause kidney function to deteriorate more quickly. A diet that is too high in protein can cause problems.

- **Exercise and control your weight**
  Exercising regularly is one of the best things you can do to improve your overall health. Exercise helps you to lower your blood sugar and blood pressure, achieve a healthy weight, improve your heart and lung health, and improve your physical, mental and emotional well being.

- **Do not overuse over-the-counter drugs**
  Prolonged and frequent use of anti-inflammatory and anti-pain medications can damage your kidneys. Talk to your doctor or pharmacist to find out how to use non-prescription medication that won't damage your kidneys.

- **Reduce stress**
  Recognize that it may take time to adjust to CKD – so be patient and set realistic goals. Keep involved in the pleasures, activities and responsibilities of daily life and share your feelings with family and close friends. Consider joining a support group.

Resources for People with Chronic Kidney Disease

Kidney Foundation of Canada (BC Branch)

Tel: 604 736-9775 (Vancouver area)
1 800 567-8112 (elsewhere in BC)
Fax: 604 736-9703
Email: info@kidneyfoundation.bc.ca

The Kidney Foundation has patient support groups in many areas of BC as well as educational material and offers short term financial assistance for those in need.

The ***Living with Kidney Disease*** patient manual produced by The Kidney Foundation of Canada is an important educational reference for people living with kidney disease. The manual is available in English & French on the Kidney Foundation web site:

www.kidney.ca/publications-eng.htm

It is also available in English, French, Chinese, Italian, Portuguese & Punjabi from the BC Branch.

BC Provincial Renal Agency (BCPRA)

Tel: 604 806-8845
Fax: 604 806-8846
Email: bcpra@cheos.ubc.ca

The BC Provincial Renal Agency is a collaborative of renal health professionals who coordinate the care of patients with kidney disease in BC.

BC Health Guide

Information on kidney disease can be found in the BC HealthGuide Online at www.bchealthguide.org or in the BC HealthGuide Handbook provided free to households throughout the province. The 24-Hour BC HealthGuide NurseLine puts you in touch with a Registered Nurse any time day or night just by calling one of the following numbers:

Local calling within Greater Vancouver:	604 215-4700
Toll-free elsewhere within BC:	1 866 215-4700
Deaf and hearing-impaired toll-free province wide:	1 866 TTY-4700

BC Chronic Disease Management Web site: www.healthservices.gov.bc.ca/cdm/patients

BCHealthServices

BRITISH COLUMBIA MEDICAL ASSOCIATION

BC Renal Agency
An Agency of the Provincial Health Services Authority

THE KIDNEY FOUNDATION OF CANADA

PROVINCIAL Health Services AUTHORITY

CHRONIC KIDNEY DISEASE PATIENT LOG

This Patient Log belongs to:

Type of kidney disease (please ✔): ☐ Diabetes ☐ Hypertension ☐ Polycystic KD ☐ Other (indicate) : _____

Latest immunization dates:

INFLUENZA	PNEUMONIA	HEPATITIS B
YYYY MMM DD	YYYY MMM DD	YYYY MMM DD

OTHER MEDICAL CONDITIONS (please list):

NAME OF FAMILY DOCTOR

TELEPHONE NUMBER

OTHER SPECIALISTS (please list)

TELEPHONE NUMBER(S)

1.

2.

ALLERGIES (please list):

3.

4.

REGULAR MONITORING

	WEIGHT	BP	CREATININE	eGFR	ADDITIONAL MONITORING			COMMENTS
GOAL ➟								
YYYY MMM DD								
YYYY MMM DD								
YYYY MMM DD								
YYYY MMM DD								
YYYY MMM DD								
YYYY MMM DD								
YYYY MMM DD								
YYYY MMM DD								
YYYY MMM DD								
YYYY MMM DD								

Take this Patient Log with you when you visit your doctor

OVER ➟

MEDICATION					
NAME OF DRUG	DOSE	FREQUENCY	PRESCRIBED BY	START DATE	STOP DATE
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					
13.					
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18.					
19.					
20.					