

Home health monitoring & CKD management in Primary Care

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Disclosure statement

- No conflicts of interest to disclose

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Objectives

- Incorporation of home health monitoring into CKD management
- Review guidelines for classification & evaluation of CKD
- Significance of proteinuria
- Recommendations for referral & risk stratification
- Plan for management of CKD in primary care

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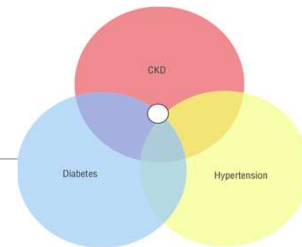
Home health monitoring

CKD

- Blood pressure
 - Weight
 - Activity
 - Medication reminder/ review
 - Dyspnea
 - Edema
 - Fatigue
 - Orthostatic symptoms
- Resources: Sodium, CKD & Hypertension education

HYPERTENSION

- Blood pressure
 - Medication reminder/ review
 - Orthostatic symptoms
 - Hypertensive symptom review
 - Edema
 - Diet check-in
 - Activity check-in
- Resources: Hypertension & dietary sodium education



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CKD Prevalence – Vancouver Island

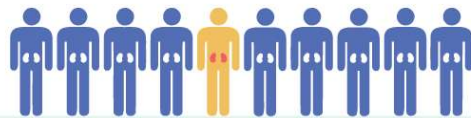
Vancouver island population: 870,000

- Prevalence of chronic disease ²
 - CKD 3% (~ 26000 patients)
 - Hypertension 28%
 - Diabetes 9%
 - Ischemic heart disease 8%

** Based on hospital diagnostic codes & Physician claims*

- Nephrologist managed CKD:
 - 3680 Registered non-dialysis patients
 - Increasing by 5%/ year ¹

1/10 British Columbians are affected by kidney disease.
MANY DON'T EVEN KNOW IT.



Check your kidney health online: kidneyhealthcheck.ca

1. Promis database, BC renal
2. BCCDC Chronic disease dashboard

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Risk Factors

Kidney disease is a silent disease.

Symptoms may not appear until extensive damage has been done to your kidneys.

An initiative of:
BCRenal
Provincial Health Services Authority

RISK FACTORS FOR CHRONIC KIDNEY DISEASE INCLUDE:



Heart
disease



High
blood
pressure



Asian,
South Asian,
Aboriginal, or
African descent



Family
history
of kidney
disease



Obesity



Smoking



Diabetes

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Screen for CKD in patients with risk factor

Risk factors:

- Diabetes
 - Hypertension
 - Cardiovascular disease
 - Prior acute kidney injury
 - Family history of kidney disease
 - Member of high risk ethnic group
 - Indigenous peoples
 - Pacific Islanders
 - African OR Asian descent
- Screen every 1 – 2 years
 - Annually for diabetics
 - eGFR
 - Urinalysis – dipstick
 - Urine ACR
 - Risk factor review

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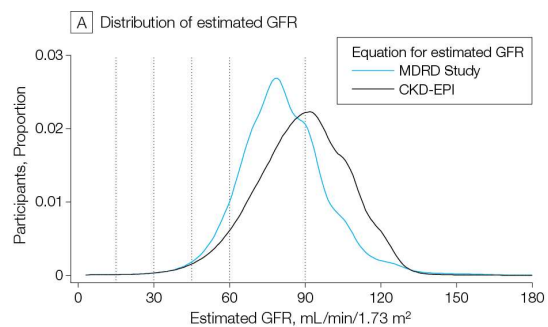
Investigation

eGFR

- calculated from serum creatinine
- CKD-EPI equation
 - Age, gender, creatinine, race
 - More accurately predicts risk
 - ESRD & Mortality

Urine albumin creatinine ratio

- Albuminuria categories:
 - A2 3 – 30 mg/mmol
 - A3 > 30mg/mmol



25% patients reclassified to higher GFR
Mainly those with GFR 45-89

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Confirmation & Interpretation

- **eGFR**

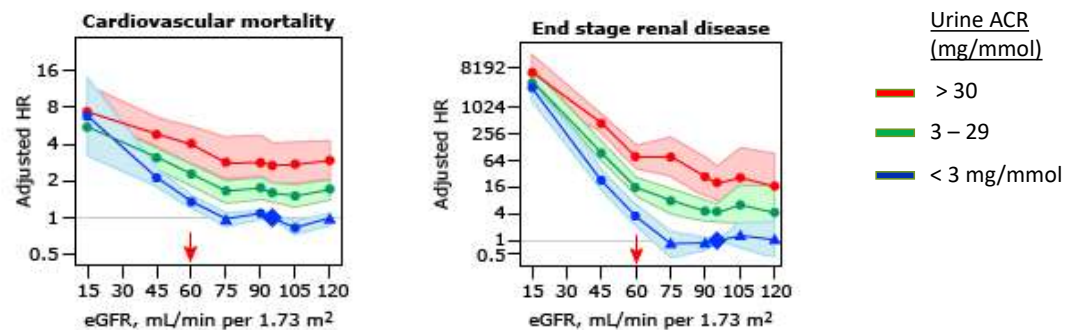
- Age > 75 - May still underestimate true GFR particularly for eGFR 45 – 60
- Age > 85 - equation more problematic & risk of progression is less

- **Albuminuria**

- Confirm Albuminuria > 3mg/mmol with repeat morning sample x 2 over time
- Large day-to-day variation
 - Transient proteinuria: Poor glucose control, exercise, UTI
- Note that dipstick tests only detect albuminuria > 300 mg (= urine ACR > 30)
 - Need to measure urine ACR in all at risk patients

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Albuminuria



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Imaging

Renal ultrasound:

- If considering PKD or urinary tract obstruction
- Evaluate chronicity - reduced renal size / atrophy
 - Reduction in cortical thickness
- Renal mass or complex cyst requires referral to UROLOGY

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Diagnosis of CKD

At least one of the following criteria present for > 3 months

Decreased GFR	<ul style="list-style-type: none"> • eGFR < 60 ml/min/1.73m²
Markers of kidney damage (1 or more)	<ul style="list-style-type: none"> • Albuminuria = Urine ACR > 30mg/mmol • Abnormal urine sediment • Pathologic abnormality on renal biopsy • Structural abnormality on imaging

What is the cause of the CKD?

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CKD Staging

Requires Urine ACR & eGFR

Numbers 1 – 4:

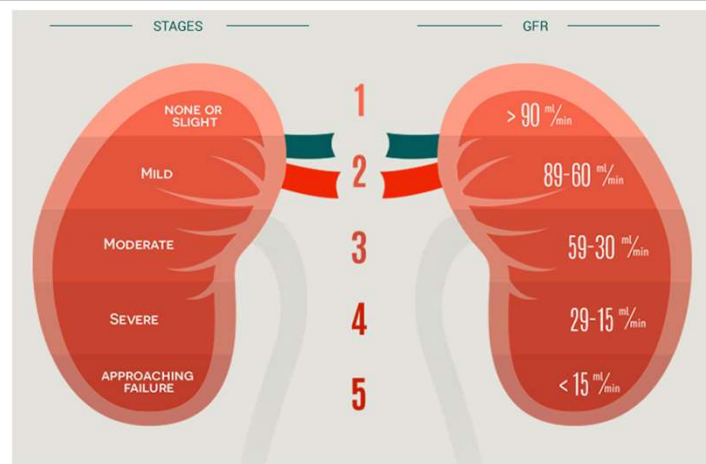
Minimum recommended monitoring frequency / year

Guide to Frequency of Monitoring (number of times per year) by GFR and Albuminuria Category

				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	>300 mg/g >30mg/mmol
GFR categories (ml/min/1.73 m ²) Description and range	G1	Normal or high	≥90	1 if CKD	1	2
	G2	Mildly decreased	60–89	1 if CKD	1	2
	G3a	Mildly to moderately decreased	45–59	1	2	3
	G3b	Moderately to severely decreased	30–44	2	3	3
	G4	Severely decreased	15–29	3	3	4+
	G5	Kidney failure	<15	4+	4+	4+

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CKD Staging



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Kidney Failure Risk Equation

<https://kidneyfailurerisk.com/>

0 - 5% LOW
5 - 15% INTERMEDIATE
>15% HIGH

Patient	Urine ACR (mg/mmol)	Risk of ESRD		Patient	Urine ACR (mg/mmol)	Risk of ESRD	
		AT 2 YEARS	AT 5 YEARS			AT 2 YEARS	AT 5 YEARS
80 yo GFR 30	1	0.92 %	2.85 %	45 yo GFR 50	15	0.72 %	2.26 %
		3.88 %	11.62 %			200	2.32 %
65 yo GFR 30	100	9.77 %	27.47 %	50 yo GFR 40	50		3 %
				50 yo GFR 30	50	9.94 %	27.88 %

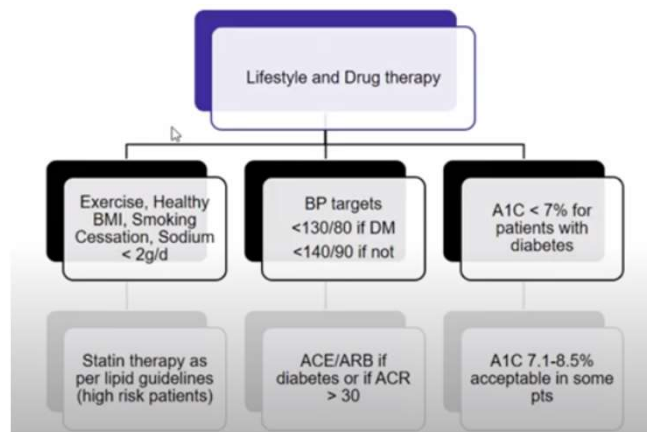
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Prevention of progression

- Blood pressure control
- Management of:
 - Albuminuria (RAAS)
 - Diabetes
 - Dyslipidemia

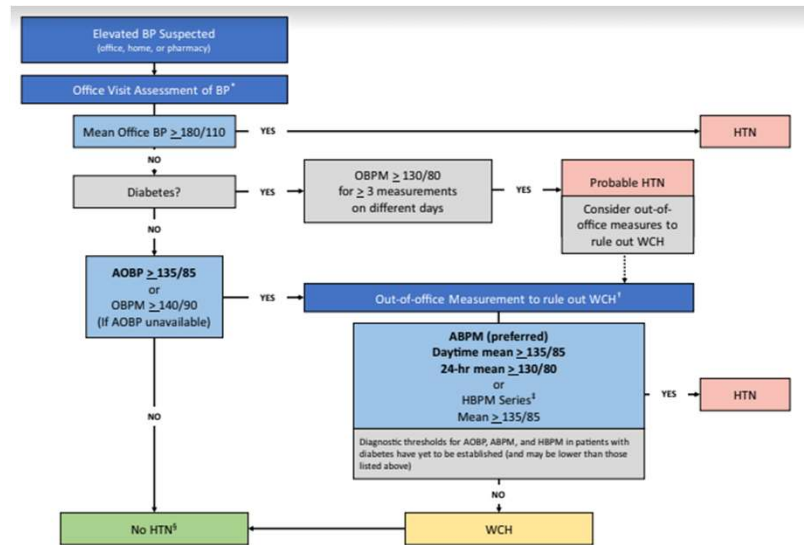
Other risk factors

- Obesity
- Smoking cessation



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Hypertension



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Treatment of hypertension slows progression of CKD

- General target <140/90 based on automated OBP
- Proteinuria (Urine ACR >30mg/mmol) and/or Diabetes
 - Target < 130/80
- Cardiovascular risk factors: Target < 120 SBP (SPRINT trial)
 - Known CV disease; eGFR 20 – 59 ml/min with ACR > 30mg/mmol
 - Framingham risk score ≥ 15; Age ≥ 75
- ADPKD: Target < 110/75 (Age < 50; eGFR > 60)
- Nocturnal BP dip:
 - Aim for 10 - 20% drop in blood pressure overnight on ABPM
- Ambulatory BP monitoring or Home BP monitoring

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ACE inhibitors & ARB

- First line treatment:
 - Proteinuric CKD - Urine ACR > 30mg/mmol; Consider if 3 – 30 mg/mmol
 - Diabetes with urine ACR > 3 mg/mmol
 - Heart failure
- CHECK creatinine & potassium at baseline AND within 2 weeks of initiating therapy OR adjusting dose
 - Accept creatinine rise of 20 – 30%, provided it stabilizes
- Continue with progressive CKD – ongoing benefit
 - Monitor for hyperkalemia in CKD stage IV/V
- Antiproteinuric effect enhanced by Thiazide type diuretic & Na restriction

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Targets for albuminuria

- Reduce urine ACR to < 30 mg/mmol
- Stabilize eGFR decline to < 1 – 2 ml/ min / year
- Educate patients:
 - IV contrast
 - Avoid NSAIDs
- If acute illness / ECFV contraction:
 - HOLD ACEi, ARB, diuretic, metformin, SGLT-2 inhibitor

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When to refer to nephrology

URGENT referral -- Please call nephrologist

- Active urine sediment – suspected GN/ vasculitis
- AKI with no readily reversible cause
- eGFR < 15
- Nephrotic syndrome

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When to refer to nephrology

Wait time < 2 - 4 months

- Diabetic nephropathy
 - Urine ACR > 30 & GFR < 45
- Uncontrolled hypertension
- Progressive CKD with rapid decline
 - > 5 ml/min/year or acute drop
- eGFR < 30
 - triage will depend on age, risk factors & chronicity

Wait time <4 – 6 months

- New dx PKD
- Persistent urine ACR > 30
- eGFR 30 – 60
- Microscopic hematuria
- Recurrent nephrolithiasis
- Diabetic nephropathy eGFR > 45

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Home Health Monitoring

- CKD Module:
 - Significant albuminuria
 - Progressive CKD
 - Adjustment of antihypertensive medications
 - Concerns about volume status management
- May be helpful while awaiting nephrology consult in some cases
- Hypertension Module:
 - Stable CKD with focus on blood pressure control or titration

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Resources

- BC CKD guidelines
 - <https://www2.gov.bc.ca/gov/content/health/practitioner-professional-resources/bc-guidelines/chronic-kidney-disease>
- CKD E-Learning for Primary Care
 - BC Renal website – Health professionals
 - <http://www.bcrenalagency.ca/health-professionals/education-development/ckd-e-learning-for-primary-care>
- <https://hypertension.ca/>

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