

KidneyWise Clinical Toolkit

Presentation developed by the Ontario
Renal Network

Learning Objectives

At the conclusion of this activity, participants will be able to...

To describe the following background information on the KidneyWise Clinical Toolkit:

- The role of the Ontario Renal Network and the Ontario Renal Plan
- The definition of chronic kidney disease
- The KidneyWise Toolkit objectives, components and updates

To complete the following steps of the KidneyWise Clinical Toolkit:

- **Identify** which individuals are at highest risk for chronic kidney disease and most appropriate for screening
- **Detect** which screening investigations to order, how to interpret the results and the criteria for appropriate referral to nephrology
- **Manage** people with chronic kidney disease in primary care



KidneyWise Clinical Toolkit Background

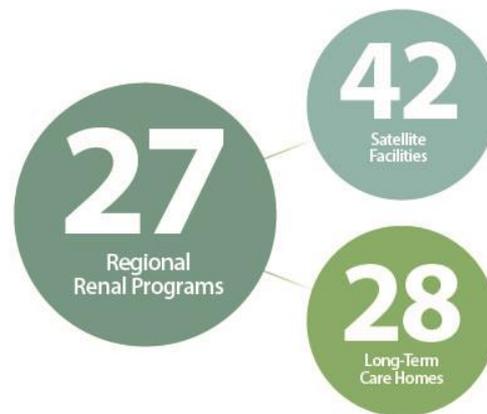
Ontario Renal Network

The **Ontario Renal Network** is the Ontario government's chronic kidney disease advisor. We are committed to facilitating a province-wide effort to diminish the burden of chronic kidney disease (CKD) on Ontarians and the healthcare system.

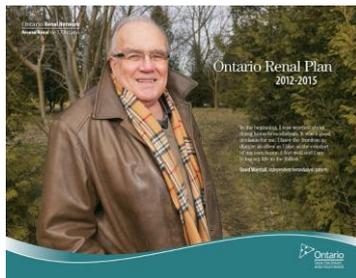


What we do

The Ontario Renal Network provides leadership and strategic direction to effectively fund, organize and manage the delivery of kidney care services in Ontario in a consistent and coordinated manner.



Primary Care in the Ontario Renal Plans



2012 – 2015

ORP 1 Primary Care Theme:
Improved early screening/detection and better management of CKD.



2015 – 2019

ORP 2 Primary Care Theme:
Support PCPs in the early identification and management of people with CKD, to reduce the risk of ESKD.



Ontario Renal Plan 3
2019-2023

ORP 3 Primary Care Theme:
Improve the efficiency and coordination of kidney care between Regional Renal Programs and partners in primary, home and community care.

What is Chronic Kidney Disease?

Definition:

Abnormalities of kidney structure or function, present for > 3 months, with implications for health

Main causes:

Diabetes, hypertension

Criteria for CKD (either of the following present for > 3 months):

- $ACR \geq 3 \text{ mg/mmol}$ and/or decreased $eGFR < 60 \text{ ml/min/1.73m}^2$ (G3a-G5)
- Other criteria:
 - Urine sediment abnormalities
 - Electrolyte and other abnormalities due to tubular disorders
 - Abnormalities detected by histology
 - Structural abnormalities detected by imaging
 - History of kidney transplantation

KDIGO CKD Guidelines, 2012

CKD Interaction with Proteinuria

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

Green: low risk (if no other markers of kidney disease, no CKD); Yellow: moderately increased risk; Orange: high risk; Red: very high risk

Risk of progression to advanced CKD/ESKD is best predicted by looking at both eGFR and ACR, not just eGFR alone.

KFRE:
80F eGFR 28, ACR 0.2
2yr ESKD risk = 1.2%

KFRE:
40M eGFR 16, ACR 500
2yr ESKD risk ~ 100%

Why Should CKD Be Important to Primary Care?

Early identification & prevention:

- ~ 90% of CKD cases are at low risk of progression, PCPs are well positioned to care for these cases¹
- Early identification and treatment can:
 - prevent/delay ESKD¹
 - reduce risk of comorbidities with associated ESKD and all-cause mortality (e.g., cardiovascular disease, diabetes)^{2,3}
- Medication reviews can prevent acute kidney injury
- Patients at increased risk of progression to advanced stages of CKD should be referred to nephrology⁴

3.1%

of Canadians have stage 3-5 CKD (0.73 million)

(Aurora et al. CMAJ 2013;185:E417-E423)

12.5%

of Canadian adults have CKD (3 million)

(Aurora et al. CMAJ 2013;185:E417-E423)

13.4%

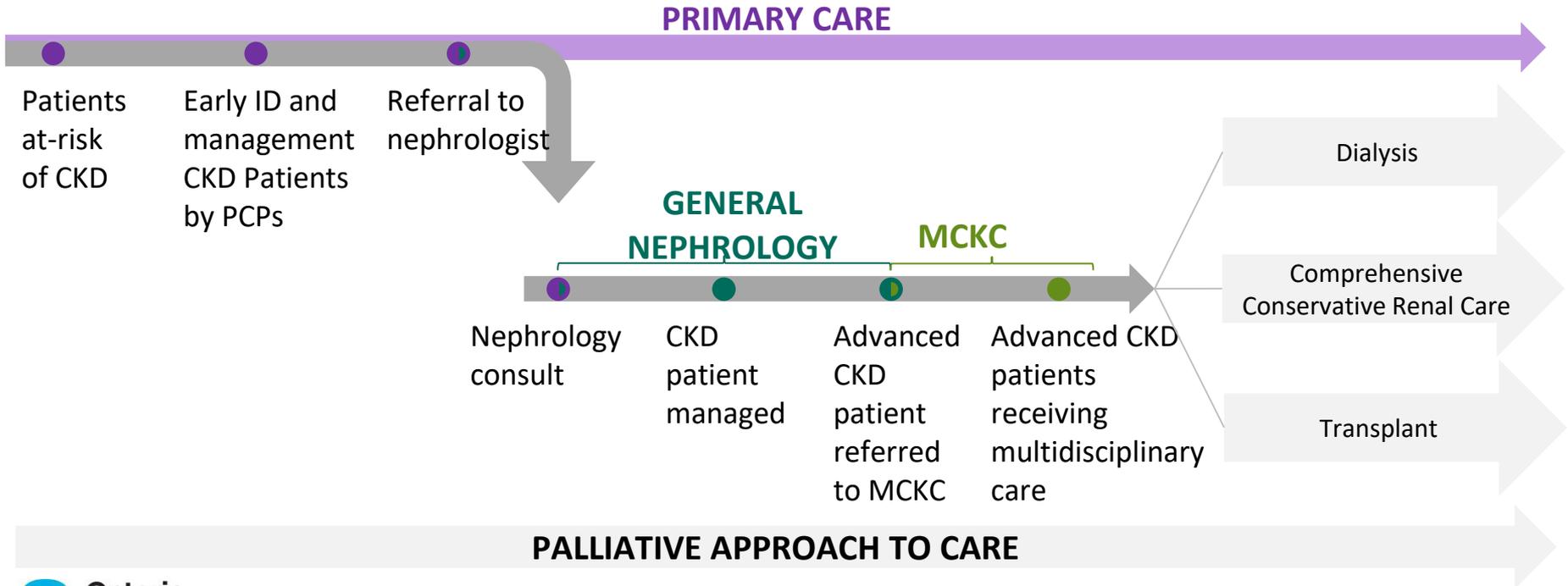
Global mean prevalence of CKD

(Bello et al. KIR 2019;4:561-570)



Simplified CKD Patient Pathway

Primary Care management of CKD doesn't stop after referral!





KidneyWise Clinical Toolkit Development

KidneyWise Clinical Toolkit

www.kidneywise.ca

- Provides guidance on the identification, detection and management of people with CKD
- Helps inform which individuals would benefit from a referral to nephrology
- Comprised of 3 components

1.

Clinical Algorithm

Guide that can be used at point of care

2.

Evidence Summary

Background information and references used for the algorithm

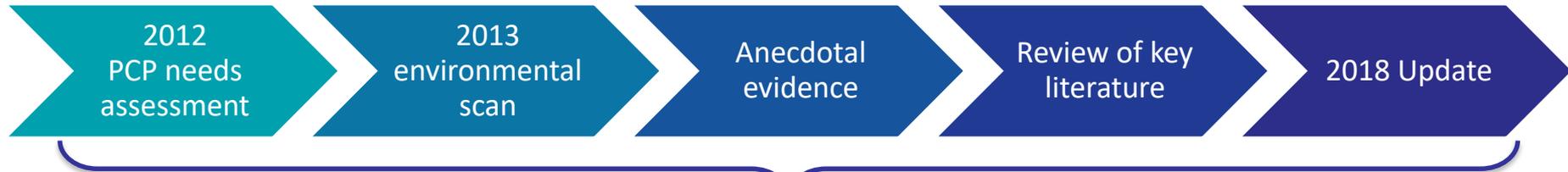
3.

Outpatient Nephrology Referral Form

Guide for appropriate referral criteria

Why Develop a CKD Clinical Tool for Primary Care?

The ORN KidneyWise Clinical Toolkit was created in response to feedback from:



Identified gaps in:

- Clinical CKD toolkits/resources available to PCPs
- CKD knowledge (suboptimal medication, CKD testing, # of referrals)

Expressed needs:

- Access to tools/decision aids based on evidence-base clinical practice guidelines
- 340 PCPs were interested in improving CKD knowledge

KidneyWise Clinical Toolkit: 2018 Updates

Identify & Evaluate

Addition of First Nations, Inuit and Métis people(s) ≥ 18 years of age as a high risk group that should be screened for CKD

Detect

Changes to the recommended referral to nephrology criteria, including a 5 year $\geq 5\%$ probability of progression to ESKD using the Kidney Failure Risk Equation

Manage

Changes to Blood Pressure Treatment targets for people with CKD and Hypertension

Updates based on new evidence from relevant CPGs
(e.g., Hypertension Canada, Diabetes Canada) & feedback from providers



Kidney Failure Risk Equation (KFRE)

Recommendation: Calculate the 5-year KFRE if eGFR < 60

Consider referring patient to nephrology if the **5-year KFRE result is $\geq 5\%$**

What is KFRE:

- A risk prediction model to measure the 2-year and 5-year risk of ESKD in people with CKD stages 3-5 (eGFR < 60)
- Calculations account for not only eGFR but also proteinuria, as well as age and sex
- Calgary, Manitoba and Halifax have included KFRE as a key criterion for referral from PCP to nephrology

KFRE Resources:

- For more information, visit ORN's About KFRE page:
 - <https://www.ontariorenalnetwork.ca/en/kidney-care-resources/clinical-tools/primary-care/kfre>
- Use a KFRE Calculator:
 - <https://qxmd.com/calculate/kidney-failure-risk-equation-4-variable>
 - www.kidneyfailurerisk.com

Why Measure KFRE?

Improved accuracy

- eGFR does not predict risk of progression in isolation
- KFRE is a better predictor of ESKD by incorporating proteinuria, as well as age and sex
- 5-year KFRE \geq 5% criterion captures higher risk patients who are missed by existing referral criteria

Improved care

- Better tailor advice and treatment for your CKD patient
- Ensure care needs are met
- Minimize disease progression
- Ability to improve care for patients with higher risk of ESKD



KidneyWise Clinical Toolkit: Identify & Evaluate

Identify & Evaluate

Identify and evaluate people in your practice with elevated risk of CKD with any one of the following:

- Hypertension (HTN)
- Diabetes mellitus (DM)
- Cardiovascular disease (CVD)
- First degree relative of someone with CKD
- First Nations, Inuit, Métis, or urban Indigenous people(s) \geq 18 years of age

Consider not screening if life expectancy is less than 5 years (e.g., frail elderly population)



Detect & Confirm

What tests should be ordered?

Creatinine/eGFR

Measure of kidney function

If eGFR < 60, repeat in 3 months or sooner if clinical concern

Urine ACR

Measure of kidney damage/injury (protein excreted in urine)

If urine ACR ≥ 3 , repeat 1-2 more times over the next 3 months

One test result is not enough to make the diagnosis of CKD.

CKD: a persistent abnormality for at least 3 months.

CKD detection should be done in the absence of acute inter-current illness, otherwise low eGFR may reflect acute kidney injury (AKI) and require more rapid evaluation

What if initial test results create clinical concern?

- **Clinical Concern** = rapid decline from previous eGFR or unexpected eGFR/urine ACR result
- Repeat eGFR & urine ACR sooner (e.g., 2 weeks)
- Renal ultrasound not recommended as part of routine CKD screening, but can be ordered to rule out a cause of AKI!

If the result of an eGFR or Creatinine test is unexpected (e.g., at annual flu vaccine or medical workup), consider the potential causes on the following slide...

Potential Causes for Unexpected eGFR

Always consider the following prior to re-testing:

- Recent treatments with nonsteroidal* anti-inflammatory drugs (NSAIDs)
- Other common medications* that may alter eGFR:
 - RAS inhibitors
 - Diuretics
 - SGLT-2 Inhibitors
 - Fenofibrate
 - Antibiotics
- Intercurrent illnesses
- Obstruction (e.g., Benign prostatic hyperplasia [BPH]/urinary retention)
- Volume depletion (e.g., dehydration due to illness)
- Use of contrast dye for diagnostic imaging
- Herbal remedies

*Some of these causes may explain a rise in serum creatinine, but may not/should not be stopped. Please use your clinical judgement.

Confirm Results 3 Months Later

eGFR \geq 60 and ACR $<$ 3



Person likely does not have CKD

Units: eGFR ml/min/1.73m², ACR mg/mmol

Follow-Up Recommendations:

- Re-test annually for individuals with diabetes, less frequently otherwise unless clinical circumstances dictate more frequent testing

Avoid labeling a person with CKD unless confirmed

Confirm Results 3 Months Later

eGFR 30-59 and/or ACR 3-60



Person has CKD,
can be followed in primary care

Units: eGFR ml/min/1.73m², ACR mg/mmol

Work-up recommendations:

- Check urine R&M (inflammatory causes), electrolytes
- Monitor in primary care

Follow-up recommendations:

- Serial following of eGFR and urine ACR to monitor for progression:
 - Every 6 months once diagnosis made
 - Annually once eGFR is stable for 2 years

During follow-up, refer to a nephrologist if:

- eGFR < 45 and decline \geq 5ml/min within 6 months, **or**
- eGFR < 30 or ACR > 60, **or**
- 5-year KFRE is \geq 5%

Use a KFRE calculator!

Confirm Results 3 Months Later

eGFR ≥ 60 and ACR < 3

Units: eGFR ml/min/1.73m², ACR mg/mmol



Person has CKD

Refer individual to a nephrologist

Maintain relationship with your patient!

Work-Up Recommendations:

- Consider ordering & sending the following with referral:
 - Urine R&M, electrolytes (for albuminuria)
 - Complete blood count (CBC), serum calcium, phosphate, albumin, parathyroid hormone (PTH) blood test (for low eGFR)

Summary of CKD Criteria

Criteria	Recommendation
eGFR \geq 60 and ACR $<$ 3	Monitor in primary care
eGFR 30-59 <u>and/or</u> ACR 3-60 Follow-up test results: <ul style="list-style-type: none">eGFR $<$ 45 and decline \geq 5ml/min within 6 months (confirmed on repeat testing within 2-4 weeks)eGFR $<$ 30 and/or ACR $>$ 60 on 2 occasions, at least 3 months apart5-year KFRE is \geq 5%	Monitor in primary care, conduct follow-up tests Refer to nephrology
eGFR $<$ 30 <u>and/or</u> ACR $>$ 60	Refer to nephrology



Other Indications for Referral to Nephrology?

Additional Indications:

- Resistant or suspected secondary hypertension
- Suspected glomerulonephritis/renal vasculitis (RBC casts or hematuria > 20 RBC/hpf)
- Metabolic work-up for recurrent renal stones
- Clinically important electrolyte disorder

Special Red Flags:

- Rapid serum creatinine increase especially if accompanied by:
 - 1) Features suggestive of vasculitis – hematuria, petechial rash, weight loss, new lung disease
 - 2) Low platelets or hemolytic anemia
 - 3) Symptoms suggestive of urinary tract obstruction

Referral to Nephrology

Recommended information to share with your referral:

- Referral details (e.g., date, name of previous nephrologist seen if this is a re-referral)
- Recommended reasons and indications for referral
- Co-morbid conditions
- Bloodwork lab values with dates where applicable
- Current medications being taken
- Contact info of referring practitioner

Outpatient Nephrology Referral Form for Primary Care

Patient Information (please fill in or affix label):
 NAME: _____ DOB: ____/____/____
 ADDRESS: _____
 PHONE #: _____ HEALTH CARD #: _____
 ALT. CONTACT INFO: _____

Outpatient Nephrology Referral Form

Date of referral: ____/____/____ Is this a re-referral? Yes No
 Name of nephrologist seen previously: _____

Recommended Reason for Referral:
Indications for referral for chronic kidney disease (CKD), including proteinuria:
 eGFR < 30 on 2 occasions, at least 3 months apart, or
 Rapid deterioration in kidney function (eGFR < 45 and decline of >= 5 within 6 months in absence of self-limited illness; eGFR must be repeated in 2-4 weeks to confirm persistent decline, or
 Proteinuria: urine ACR > 60 mg/mmol on at least 2 of 3 occasions, or
 >= year KtVE >= 5%

Other indications for referral to nephrology:
 Resistant or suspected secondary hypertension
 Suspected glomerulonephritis/renal vasculitis, including NSC casts or hematuria (> 20 RBC/Hpf)
 Metabolic work-up for recurrent renal stones
 Clinically important electrolyte disorder
 Other (have you considered utilizing the provincial eConsult service?): _____

Additional Comments:

Co-morbid Conditions:
 Diabetes mellitus Coronary artery disease Hypertension Frailty Peripheral vascular disease
 Previous stroke Cognitive impairment Connective tissue disease (eg SLE, RA, vasculitis)

Lab Values:
 Please fill out below if applicable; refer to the ORN KidneyWise Clinical Algorithm for suggested investigations

Date #1: _____	eGFR:	Creatinine:	Urine ACR:
Date #2: _____	eGFR:	Creatinine:	Urine ACR:
HbA1c: _____	Hgb:	K ⁺ :	Ca ²⁺ :
PO ₄ ³⁻ :	Albumin:	PTH:	Hematuria (dipstick):

Other (or attach): _____

Current Medications: (please attach separately)

Referring Practitioner/Address/Phone/Fax: _____

Referring Billing #: _____

Signature: _____

- Consult the KidneyWise Referral Form for additional guidance on sending informative referrals
- Consider using this form or incorporating it into your existing communication systems

Most patients with non-progressive/low-risk CKD can be managed by primary care providers!



Manage

BP Treatment Targets

For people with CKD

- Systolic BP Target **<120 mmHg**
- Diastolic BP Target **<90 mmHg**
- Notes: People with CKD, excluding comorbidity with DM, were considered high-risk in SPRINT study and showed benefit when BP was treated towards a target of **<120 mmHg**

For people with CKD and DM

- Systolic BP Target **<130 mmHg**
- Diastolic BP Target **<80 mmHg**
- Notes: As per HTN Canada and Diabetes Canada clinical practice guidelines, people with DM have a SBP treatment target of **<130 mmHg**.

These patients were excluded from the SPRINT study



BP Treatment Targets

For patients with CKD and any one of the following characteristics:

- Frail elderly
 - Resides in Long-Term Care/
Nursing Home
 - Polypharmacy (>5 medications)*
 - History of Stroke
 - Chronic illness likely to limit
life expectancy to < 3 years
- Systolic BP Target **<140 mmHg**
 - Diastolic BP Target **<90 mmHg**
 - Notes: Use caution when
treating SBP to target; risks
may outweigh benefits when
DBP < 60 mmHg

BP treatment targets may vary depending on patient characteristics
(e.g., people with diabetes mellitus, frailty, life expectancy, etc.)

Summary: BP Targets & RAS Blockade

Patient Population	Systolic BP Target	Diastolic BP Target	ACEI or ARB
People with CKD (without DM)	<120 mmHg	<90 mmHg	Use if ACR > 30 and BP not a target
People with CKD and DM	<130 mmHg	<80 mmHg	Use if ACR > 3 Use cautiously if BP already < 130/80, monitor for hypotension
People with CKD that have any one of the following characteristics: <ul style="list-style-type: none"> • Frail elderly • Resides in Long-Term Care/Nursing Home • Polypharmacy (>5 medications) • History of Stroke • Chronic illness likely to limit life expectancy to < 3 yrs. 	<140 mmHg	<90 mmHg	Case-dependent

Electrolytes/Creatinine blood test 2 weeks after starting ACEI or ARB

Reduce CVD risk and/or slow CKD progression

- Lifestyle modification, smoking cessation
- For primary prevention, treat adult patients with the following conditions with a low dose statin*:
 - CKD with diabetes
 - CKD without diabetes, age ≥ 50
 - CKD with known coronary artery disease, prior stroke, or 10-year Framingham risk $> 10\%$
- For people with diabetes, target HbA1c to appropriate level using recommended therapies as per Diabetes Canada guidelines

Managing Diabetes & CKD

- Treat with RAS inhibition (ACEIs or ARBs), provided BP not low and symptomatic
- Control Hypertension $< 130/80$ using RAS inhibition, salt restriction and other anti-hypertensives as required
- Treat with SGLT2 inhibitors if have type 2 diabetes and eGFR over 30

Minimize further kidney injury

Actions to consider

- Avoid nephrotoxins such as NSAIDs, intravenous (IV) and intra-arterial contrast, etc. whenever possible (if eGFR < 60).
- If contrast necessary, consider oral hydration, withholding diuretics.

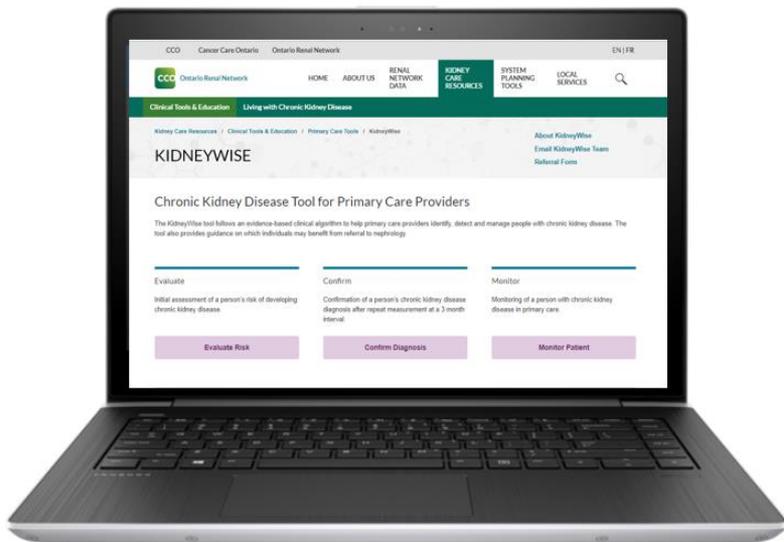
References to consult

- Refer to the ORN [Medication Safety List](#) consisting of 41 commonly prescribed medications that should be avoided or dose adjusted.
- Refer to [Evidence Summary \(PDF\)](#) for the Sick Day Medication List and list of renally excreted medications to adjust (SADMANS).

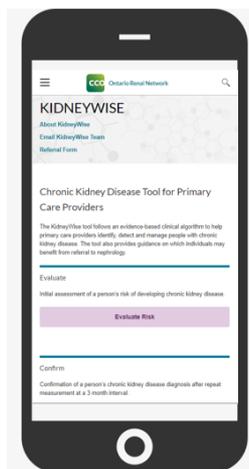


Overview

Accessing KidneyWise



Interactive Website



Mobile
Compatible



Printable Documents
(available on website)

Additional Resources for Primary Care

Medication Safety List

- A list of medications commonly prescribed in primary care that should be avoided or dose-adjusted for people with chronic kidney disease.
- Visit <https://www.ontariorenalnetwork.ca/en/medicationsafety>

eConsult

- Do you have questions about your patient that you'd like to ask a nephrologist? Sign-up for eConsult and ask one of the 40+ nephrologists.
- Contact eConsultCOE@toh.ca to learn how to make eConsult a regular part of your practice

KFRE

- The ORN has outlined when and how to measure KFRE, well as more background evidence for your reference.
- Visit <https://www.ontariorenalnetwork.ca/en/kidney-care-resources/clinical-tools/primary-care/kfre>

Publication in Canadian Family Physician

For more information:



Chronic kidney disease

SÉRIOSA / TOUCHEZ 728
CHRONIC KIDNEY DISEASE / 728-735
SÉRIOSA / TOUCHEZ 728
IN NETWORKS 728
SERIOUS / TOUCHÉZ 728-735

TOUCHEZ SÉRIOSA / TOUCHEZ 728
SÉRIOSA / TOUCHEZ 728-735
SÉRIOSA / TOUCHEZ 728
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CLINICAL REVIEW

Approach to the detection and management of chronic kidney disease

What primary care providers need to know

Allan K. Grill MD CCFP(COE) MPH FCFP Scott Brimble MD MSc FRCPC

Abstract

Objective To help primary care providers, both family physicians and nurse practitioners, identify, detect, and manage patients with and at risk of chronic kidney disease (CKD), as well as outline criteria for appropriate referral to nephrology.

Sources of information Published guidelines on the topic of CKD and its comorbidities were reviewed. A MEDLINE search was conducted using the MeSH terms *chronic renal insufficiency*, *family practice*, and *primary health care*. The search was limited to reviews and articles in English. The search covered all relevant articles from 2006 to the present.

Main message The KidneyWise clinical tool kit, created by the Ontario Renal Network and available at www.kidneywise.ca, provides evidence-informed, practical guidance to primary care providers on the diagnosis and management of CKD. A component of this tool is an algorithm that offers a step-by-step approach to diagnosing and managing CKD. This resource will help empower providers to identify those at high risk of this condition, order appropriate diagnostic tests, help prevent further disease progression, and reduce comorbid cardiovascular risk in patients with CKD.

Conclusion Most patients with CKD can be managed in primary care. Serial follow-up is essential to identify patients at high risk of progression to advanced stages of CKD, including end-stage renal disease. Primary care providers must continue to work together with local nephrologists to improve the lives of those living with CKD.

CFP, October 2018 – pg. 728-735

Key Messages

Using KidneyWise will make CKD care easier and improve patient outcomes

1. Identification

Test individuals at high risk of CKD and in the absence of acute intercurrent illness

Avoid in elderly individuals with limited life expectancy

2. Detection

eGFR and urine ACR are the tests of choice

3. Management

Most cases of CKD in primary care are low-risk and can be managed by PCPs

Refer to nephrology as appropriate:

- eGFR < 30 (2 occasions, 3+ months apart), or
- Rapid deterioration in kidney function, or
- Urine ACR > 3 on at least 2 of 3 occasions, or
- 5-year KFRE \geq 5%

Acknowledgements

- KidneyWise has been vetted and endorsed by nephrologists and PCPs within Ontario and across Canada
- Development of KidneyWise was led by these provincial medical leads at the Ontario Renal Network:
 - **Dr. Allan Grill**, MD, CCFP, MPH, Provincial Primary Care Lead
 - **Dr. Scott Brimble**, MD, MSc, FRCPC, Provincial Lead for Early Detection & Prevention of Progression
- Development of this presentation was led by:
 - **Dr. Peter Blake**, MD, FRCPC, Provincial Medical Director
 - The Early CKD team at the Ontario Renal Network

Questions?



www.Kidneywise.ca



Appendix

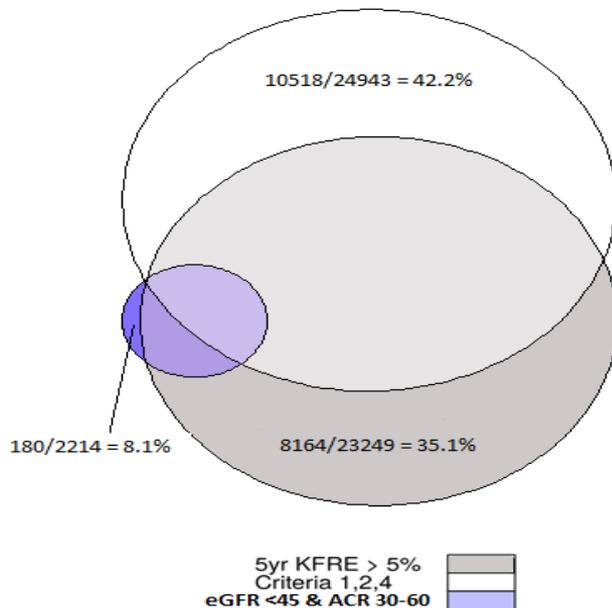
Acronyms List

- ACEI – angiotensin-converting-enzyme inhibitor
- ACR – albumin-to-creatinine ratio
- AKI – acute kidney injury
- ARB – angiotensin II receptor blocker
- BP – blood pressure
- BPH – benign prostatic hyperplasia
- CBC – complete blood count
- CKD – chronic kidney disease
- CPG – clinical practice guidelines
- CVD – cardiovascular disease
- DM – diabetes mellitus
- eGFR – estimated glomerular filtration rate
- EMR – electronic medical record
- ESKD – end-stage kidney disease
- HTN – hypertension
- ICES – Institute for Clinical Evaluative Sciences
- IV – intravenous
- KFRE – Kidney Failure Risk Equation
- LTC – long-term care
- MCKC – Multi-Care Kidney Clinics
- NSAIDs – nonsteroidal anti-inflammatory drugs
- ORN – Ontario Renal Network
- ORP – Ontario Renal Plan
- PCP – primary care provider
- PTH – parathyroid hormone

KFRE vs. Existing KidneyWise Criteria

The Institute for Clinical Evaluative Sciences (ICES) identified how many patients meet 1+ KidneyWise referral criteria, and how these criteria compare with 5-year KFRE \geq 5%

Out of 2,214 people meeting the eGFR <45 and ACR 30-60 criterion, only 180 (8.1%) are not captured by the 5-year KFRE \geq 5%



8,164 people with a 5-year KFRE \geq 5% are not captured by existing KidneyWise criteria (high risk)

KFRE Inclusion Working Group Members

ORN convened a working group to review the ICES analysis and provide recommendations

Member Name	Expertise	Location
Dr. Scott Brimble (Chair)	Nephrology	St. Joseph's Health Care Hamilton
Dr. Allan Grill	Family Medicine	Markham Family Health Team/MSH
Dr. Philip Boll	Nephrology	Trillium Health Partners
Dr. Brenda Hemmelgarn	Nephrology	University of Calgary/Alberta Health Services
Dr. Peter Magner	Nephrology	The Ottawa Hospital
Dr. Amber Molnar	Nephrology	Institute for Clinical Evaluative Sciences/ St. Joseph's Health Care Hamilton

BP Target Expert Panel Members

ORN convened an expert panel to review latest evidence and agree upon BP treatment target recommendations for people with CKD and HTN being managed in primary care

Member Name	Expertise	Location
Dr. Scott Brimble (co-Chair)	Nephrology	St. Joseph's Health Care Hamilton
Dr. Allan Grill (co-Chair)	Family Medicine	Markham Family Health Team/MSH
Dr. Parm Singh	Family Medicine	Markham Family Health Team/MSH
Dr. Jeremy Rezmovitz	Family Medicine	Sunnybrook Health Sciences Centre
Dr. Dee Mangin	Family Medicine	McMaster University
Dr. Brenda Hemmelgarn	Nephrology	University of Calgary/AHS
Dr. Marcel Ruzicka	Nephrology	The Ottawa Hospital
Dr. Philip McFarlane	Nephrology	St. Michael's Hospital