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**Kidney
Wise**

Detect + Protect

Changing the Approach to Treating HTN in the Elderly: Slow Down or SPRINT

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OLTCC Conference, October 20, 2018



Faculty/Presenter Disclosure

Faculty: Dr. Allan Grill

I have the following relevant financial relationships to disclose:

- Consultant for: CCO – Ontario Renal Network

Relationships with commercial interests:

- **Not Applicable**



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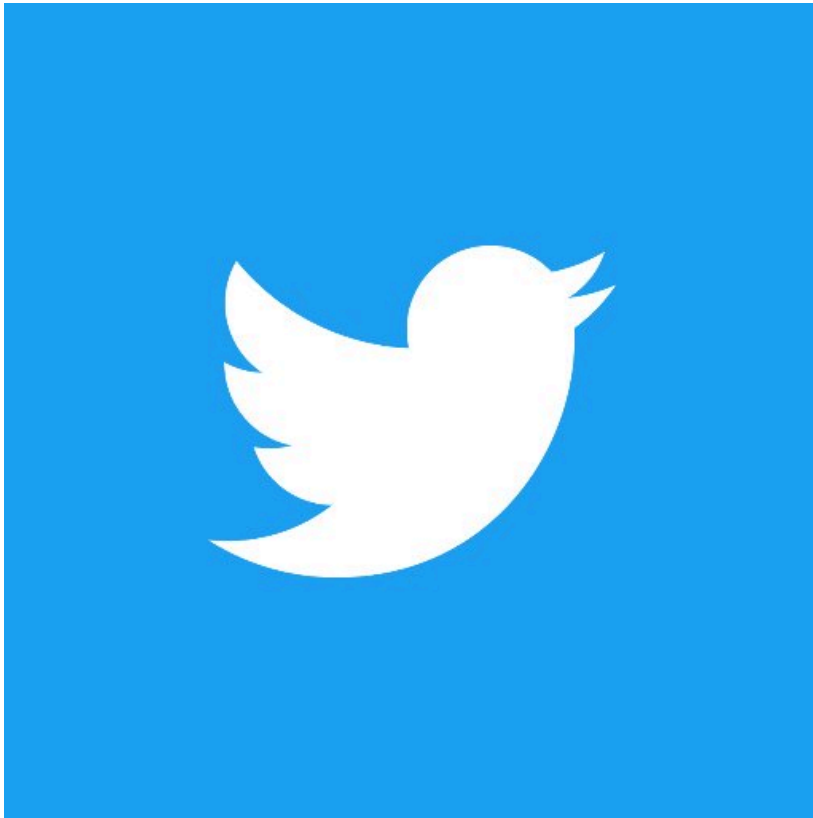


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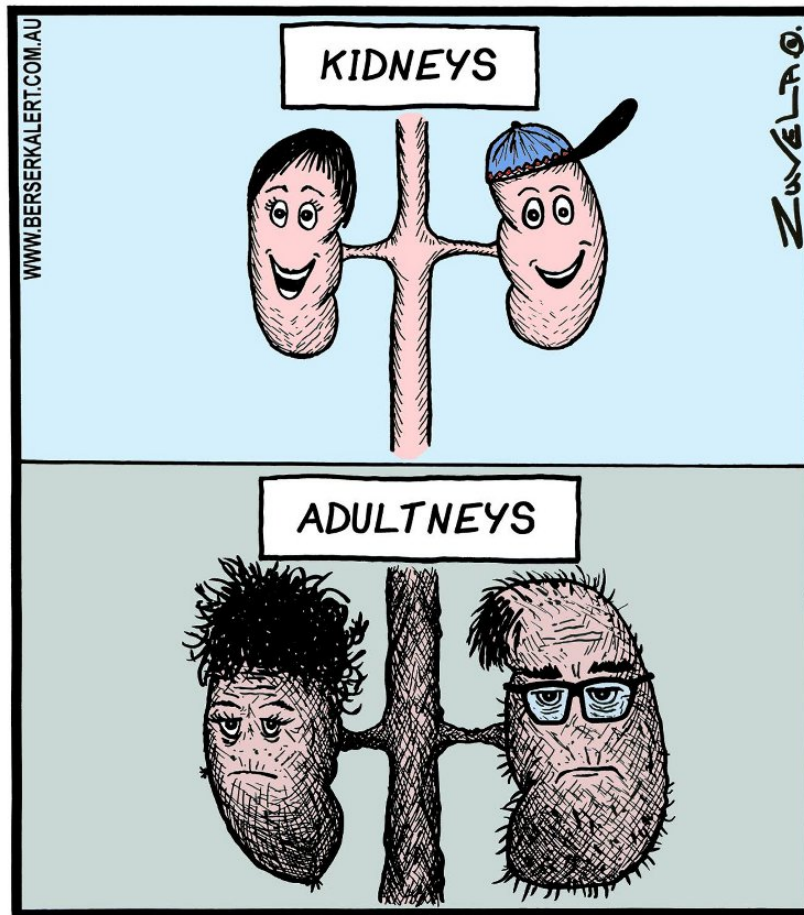
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- @allan_k_grillMD
#PPLTC18





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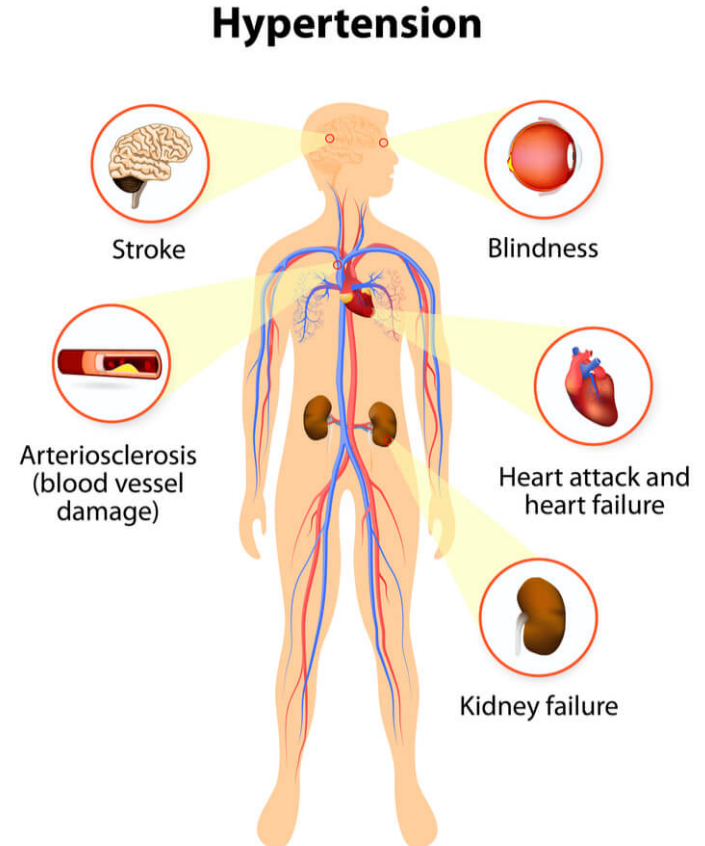
Learning Objectives

- To review the Hypertension (HTN) Canada guideline on the proper measurement of blood pressure (BP) & diagnosis of HTN
- To identify which elderly patients should be considered for more intensive BP treatment targets (SPRINT trial)
- To introduce the recent updated changes to the 2018 ORN KidneyWise Clinical Toolkit for Primary Care
 - BP targets for patients with CKD + HTN
 - Kidney Failure Risk Equation (KFRE) – a new addition to the referral criteria for nephrology consultation



Hypertension

- Common chronic disease in Canada – 25% of adult population
- 2/3rds of US adults over age 60
- Associated with CKD (main risk factor), CVD, and death.
 - 75% of patients with 1st stroke/MI/CHF have HTN
- “The Silent Killer”



Defining Hypertension & Measuring Blood Pressure

- HTN Canada Guidelines 2017 ([Can J Cardiol](#) 2017; 33(5): 557-576):
- Consider checking BP during:
 - Periodic health exams
 - Visits for assessment of other CV risk factors
 - Urgent office visits for neurological or cardiovascular related issues
 - HTN Medication renewal visits
- Measurement using electronic (oscillometric) upper arm devices is preferred over auscultation (Grade C).
 - BP obtained in routine clinical practice is on average 9/6 mm Hg higher than standardized measurements

Defining Hypertension & Measuring Blood Pressure

- Automated Office Blood Pressure (AOBP) is the preferred method of performing in-office BP measurement - OBPM (Grade D).
 - Multiple (3-6, depending on the device) pre-programmed measurements, usually spaced one minute apart over 4-7 minutes, are taken while the patient is alone in a quiet room
 - If using non-AOPB measurement, **take 3 readings** – discard the 1st, and average the next 2 readings
- Patient's arm should be positioned at level of heart (atria)
 - If below - can lead to BP overestimation of 7-10/8-11 mm Hg
 - Leg crossing, talking, failure to support arm & inappropriate cuff size also overestimate BP

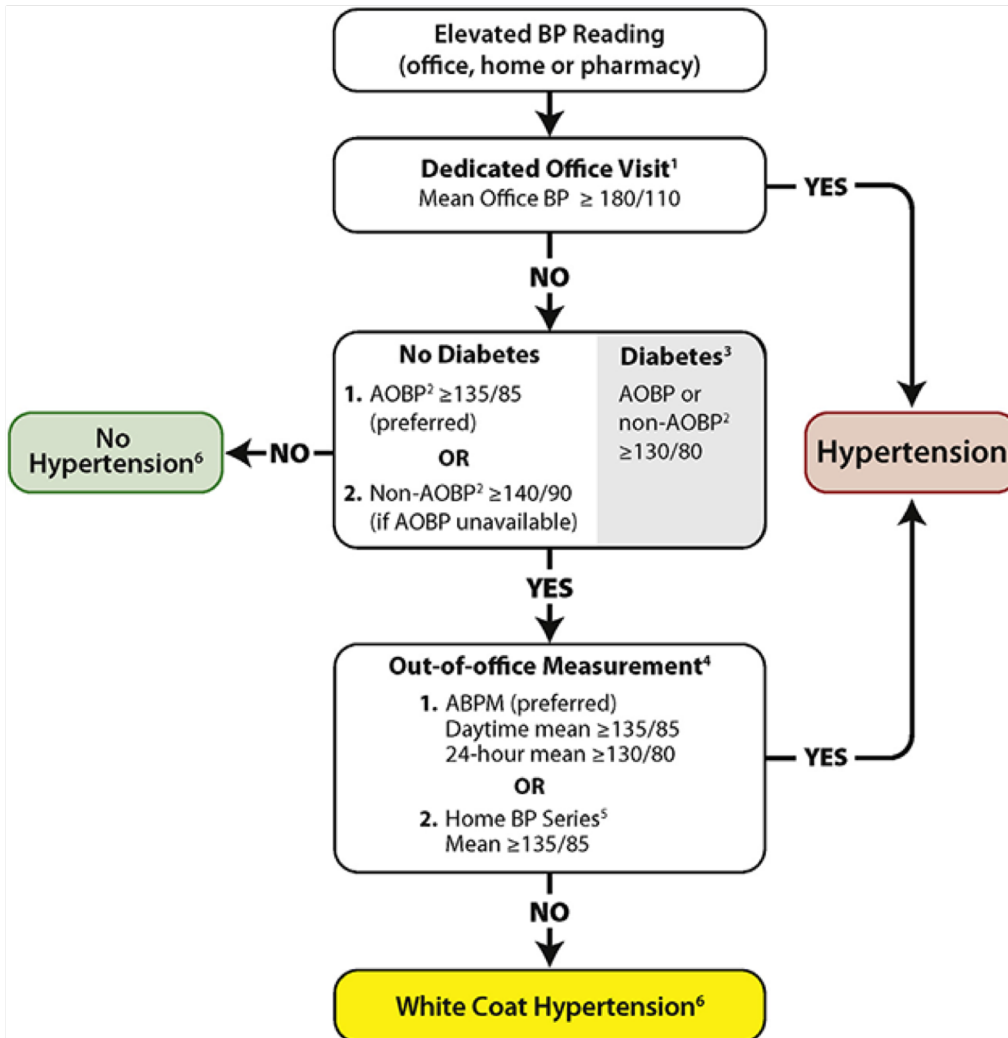
Defining Hypertension & Measuring Blood Pressure

- SBP ≥ 180 mmHg or DBP ≥ 110 mmHg, regardless of measurement method, is considered **HTN**.
- AOBP: SBP ≥ 135 mmHg or DBP ≥ 85 mmHg is **high** (Grade D).
- Non-AOBP: SBP ≥ 140 mmHg or DBP ≥ 90 mmHg is **high** (Grade C).
- For diabetes: SBP ≥ 130 mmHg or DBP ≥ 80 mmHg is **high**
- If the any of above 3 criteria are met, perform ambulatory BP monitoring (ABPM) or home BP monitoring (HBPM) to r/o **HTN vs. White Coat HTN** (Grade D).
 - Serial office BP measurements over 3-5 visits can be used to diagnose **HTN** if above not available;
 - However, 36,500 patients/year will be misclassified with HTN

Defining Hypertension & Measuring Blood Pressure

- ABPM: **mean awake** SBP ≥ 135 mmHg or DBP is ≥ 85 mmHg or if the **mean 24-hour** SBP is ≥ 130 mmHg or the DBP is ≥ 80 mmHg (Grade C).
- HBPM: SBP is ≥ 135 mmHg or the DBP is ≥ 85 mmHg (Grade C).
 - 2 readings qAM + qPM x 7d; discard 1st day; take avg.
- If OBPM is high, but mean HBPM is $< 135/85$ mmHg, or ABPM is $< 135/85$ mmHg (daytime) or $< 130/80$ mmHg (24-hour), patient has **white coat hypertension** and should not be treated (Grade D).
- See next slide for summary of slides 9-12.

Summary – HTN Canada

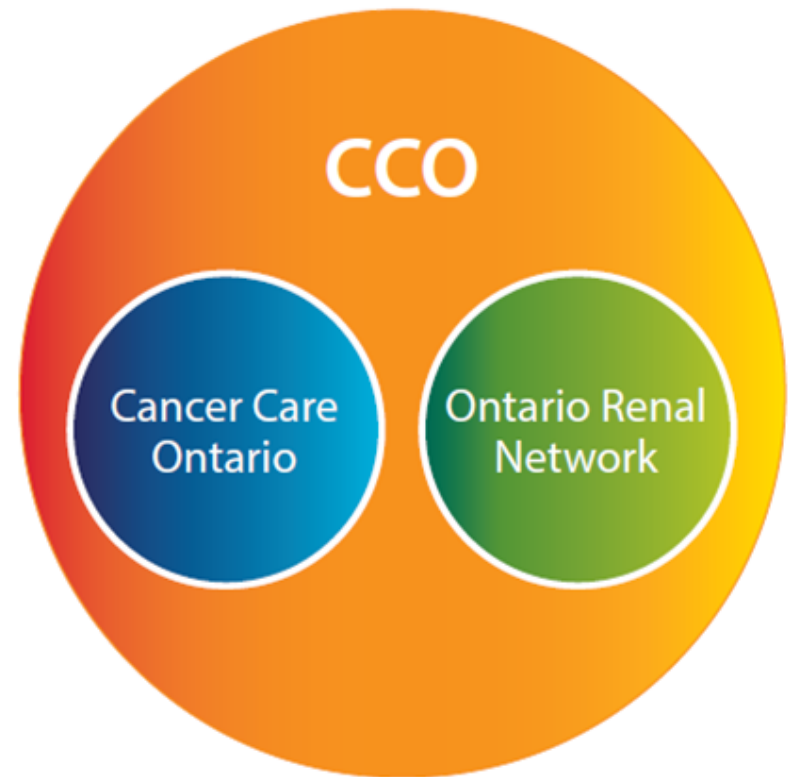


Notes:

1. If AOBP is used, use the mean calculated and displayed by the device. If non-AOBP (see note 2) is used, take at least three readings, discard the first and calculate the mean of the remaining measurements. A history and physical exam should be performed and diagnostic tests ordered.
2. **AOBP** = Automated Office BP. This is performed with the patient unattended in a private area. **Non-AOBP** = Non-automated measurement performed using an electronic upper arm device with the provider in the room.
3. Diagnostic thresholds for AOBP, ABPM, and home BP in patients with diabetes have yet to be established (and may be lower than 130/80 mmHg).
4. Serial office measurements over 3-5 visits can be used if ABPM or home measurement not available.
5. Home BP Series: Two readings taken each morning and evening for 7 days (28 total). Discard first day readings and average the last 6 days.
6. Annual BP measurement is recommended to detect progression to hypertension.

About the Ontario Renal Network

- Responsible for overseeing and funding the delivery of chronic kidney disease (CKD) services across Ontario
- A 'network' of all the kidney care programs in Ontario
- Early detection and prevention of progression of CKD in the primary care setting is a main priority
- Ontario Renal Plan II is a roadmap that outlines how the Ontario Renal Network (ORN) will try to improve the lives of those living with CKD



KidneyWise Toolkit (2015)

The Toolkit provides guidance on the identification, detection and management of patients with CKD, and helps inform which patients would benefit from a referral to nephrology. By using the toolkit, primary care providers (PCPs) can help prevent further disease progression and reduce the risk of cardiovascular comorbidities.

- **Components of KidneyWise Toolkit**
 1. Clinical Algorithm
 2. Evidence Summary
 3. Outpatient Nephrology Referral Form

KidneyWise Toolkit 2015: BP Treatment Targets

- If with diabetes, target BP <130/80, otherwise target BP <140/90
- Consistent with HTN Canada guidelines
- Proper BP control reduces CV risk and slows CKD progression

Systolic Blood Pressure Intervention Trial



The NEW ENGLAND
JOURNAL of MEDICINE

ESTABLISHED IN 1812 NOVEMBER 26, 2015 VOL. 373 NO. 22

A Randomized Trial of Intensive versus Standard Blood-Pressure Control

The SPRINT Research Group[®]

In patients > 50 y.o. at high risk for CVD, does intensive BP control (target SBP <120 mm Hg) yield superior CV outcomes compared to standard treatment (target SBP 135-139 mm Hg)?

SPRINT Trial

Table 3. Clinical indications defining high-risk patients as candidates for intensive management

Clinical or subclinical cardiovascular disease
or
Chronic kidney disease (nondiabetic nephropathy, proteinuria < 1 g/d, estimated glomerular filtration rate 20-59 mL/min/1.73m^{2*})
or
†Estimated 10-year global cardiovascular risk ≥ 15%
or
Age 75 years or older
Patients with ≥1 clinical indication should consent to intensive management

- Showed reduction in the primary composite CV events outcome (non-fatal MI, ACS, stroke, CHF, CV-related death).
 - event rate of 1.65% per year compared with 2.19% per year in those assigned to standard treatment (HR, 0.75; 95% CI, 0.64-0.89)
- All cause mortality rate, a secondary outcome, was also reduced
- SPRINT study **excluded** patients with diabetes, CHF (EF under 35%), previous stroke, Polycystic kidney disease, dementia, those with an eGFR < 20 or > 1 g/day proteinuria, living in LTC facility, standing BP < 110 mmHg

Other Relevant HTN Trials

- ACCORD BP (Action to Control CV Risk in Diabetes-Blood Pressure) trial also looked at intensive BP control in patients with diabetes
 - Lowering BP closer to 120mmHg vs. 140mmHg resulted in small decrease stroke risk (NNT 476), but **no benefit** CV death
- HYVET (HTN in the Very Elderly Trial) trial looked at BP control in elderly patients (over 80 y.o.)
 - Baseline SBP was 160-199 mmHg
 - Treatment arm - treat BP to < 150/90 vs. Placebo arm
 - Primary outcome = fatal and non-fatal stroke – not statistically significant
 - Secondary outcome = all-cause mortality, fatal stroke, CV events – statistically significant (21% reduction in all-cause mortality)

Other Published Evidence

- American Heart Association (AHA) HTN guideline - 2017
- Summary table below indicates all adult patients with CKD should be targeted to BP < 130/80

9.3. Chronic Kidney Disease

Recommendations for Treatment of Hypertension in Patients With CKD		
References that support recommendations are summarized in Online Data Supplements 37 and 38 and Systematic Review Report.		
COR	LOE	Recommendations
I	SBP: B-R ^{SR}	1. Adults with hypertension and CKD should be treated to a BP goal of less than 130/80 mm Hg (1-6).
	DBP: C-EO	
IIa	B-R	2. In adults with hypertension and CKD (stage 3 or higher or stage 1 or 2 with albuminuria [≥ 300 mg/d, or ≥ 300 mg/g albumin-to-creatinine ratio or the equivalent in the first morning void]), treatment with an ACE inhibitor is reasonable to slow kidney disease progression (3, 7-12).
IIb	C-EO	3. In adults with hypertension and CKD (stage 3 or higher or stage 1 or 2 with albuminuria [≥ 300 mg/d, or ≥ 300 mg/g albumin-to-creatinine ratio in the first morning void]) (7, 8), treatment with an ARB may be reasonable if an ACE inhibitor is not tolerated.

SR indicates systematic review.



Diastolic Blood Pressure – How Low Can You Go?

- DBP is the major determinant of coronary blood flow
- Evidence exists of excess ischemic cardiac events resulting from very low DBP - post hoc analyses RCTs and from cohort studies
 - Causal relationship or surrogate for poor vascular health
- Is there a level of DBP at which the CV benefits of SBP lowering can be offset by adverse CV outcomes precipitated by low DBP?

Ruzicka et al. (2017) Thus Far and No Further: Should Diastolic Hypotension Limit Intensive Blood Pressure Lowering? Current Treatment Options in Cardiovascular Medicine

Diastolic Blood Pressure – How Low Can You Go?

- Protogerou et al: elderly patients (> age 70); DBP < 60mmHg predicted mortality independent of CV risk factors.
- Post-hoc analysis of INVEST study (HTN Tx in patients with HTN/DM/CAD) – primary outcome of all-cause death, non-fatal MI quadrupled when DBP < 60; no increased stroke risk.
- Systolic Hypertension in the Elderly Program (SHEP) study
 - CV risk benefit disappeared when DBP < 70mmHg
 - RR of CV event increased when DBP < 55mmHg
- SPRINT study: avg. DBP in intensive Tx arm was 68.7mmHg – higher than previous trials mentioned above.
 - Population with DBP < 60mmHg may have been underrepresented

Ruzicka et al. (2017) Thus Far and No Further: Should Diastolic Hypotension Limit Intensive Blood Pressure Lowering? Current Treatment Options in Cardiovascular Medicine

Diastolic Blood Pressure – How Low Can You Go?

- Authors' conclusions:
- Studies suggest more adverse CV outcomes at DBP less than 60mmHg
- Suggest caution in further lowering of SBP in the presence of low DBP
 - elderly population
 - Patients with pre-existing LVH and/or CAD
- Shared decision-making, with explicit discussion is necessary
 - potential trade-offs between benefit from SBP lowering and harm from development of diastolic hypotension
- More research is needed to identify a subset of patients at higher risk of adverse events related to diastolic hypotension

Ruzicka et al. (2017) Thus Far and No Further: Should Diastolic Hypotension Limit Intensive Blood Pressure Lowering? *Current Treatment Options in Cardiovascular Medicine*

Why Refresh the KidneyWise Toolkit?

- KW Toolkit originally published in 2015
- Received feedback from clinical experts over last 3 years
- New evidence available regarding blood pressure (BP) treatment targets for people with CKD and hypertension (HTN) – SPRINT trial (2017)

BP Treatment Targets

- In November 2017, the ORN convened an expert panel (4 nephrologists and 4 PCPs) to review latest evidence, and used a consensus model to provide BP treatment target recommendations for people with CKD and HTN being managed in primary care
- BP treatment targets may vary depending on patient characteristics (e.g. people with diabetes mellitus, frailty, life expectancy, etc.)

BP Target Expert Panel Members

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/ Alberta Health Services
Dr. Marcel Ruzicka	Nephrology	The Ottawa Hospital
Dr. Philip McFarlane	Nephrology	St. Michael's Hospital



Proposed Recommendations: BP Treatment Targets

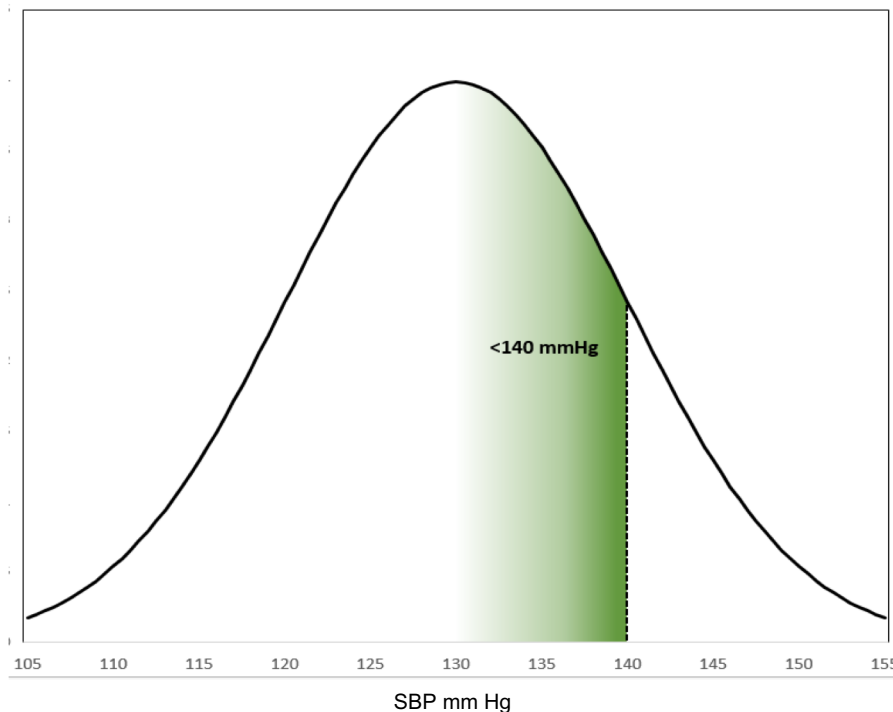
Does your patient with CKD have any one of the following characteristics?

- Frail Elderly
- Resides in Long-Term Care/ Nursing Home
- Polypharmacy (>5 medications)*
- History of Stroke
- Chronic illness likely to limit life expectancy to < 3 yrs.

Yes

No

If 'Yes' – Proposed BP Treatment Targets



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

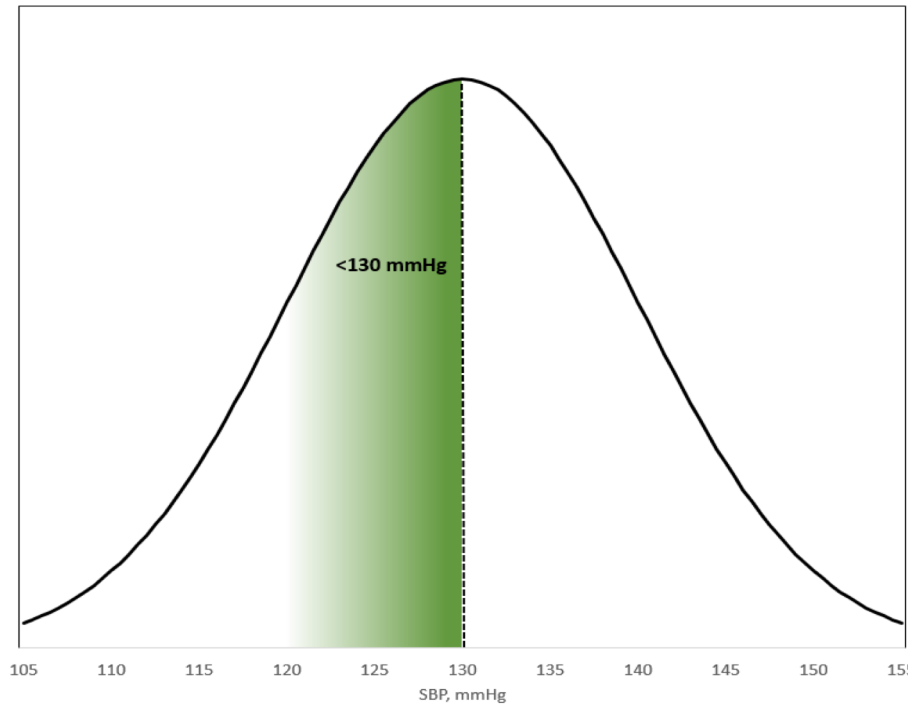
If 'No' – Proposed BP Treatment Targets

2. Does your patient have diabetes mellitus (DM)?

Yes

No

If 'Yes' – Proposed BP Treatment Targets



Systolic BP Target

<130 mmHg

Diastolic BP Target

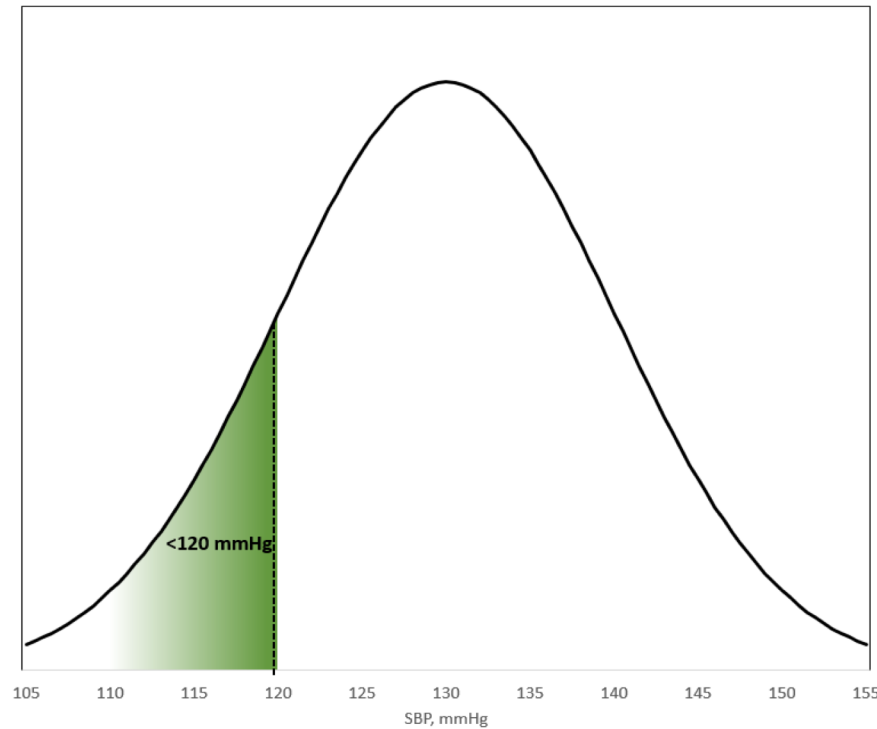
<80 mmHg

Notes

As per HTN Canada and Diabetes Canada clinical practice guidelines, people with diabetes mellitus have a SBP treatment target of <130 mmHg.

These patients were excluded from the SPRINT study

If 'No' – Proposed BP Treatment Targets



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

Next

Summary of Proposed BP Treatment Targets

Patient Population	Systolic BP Target	Diastolic BP Target
People with CKD (without DM)	<120 mmHg	<90 mmHg
People with CKD and DM	<130 mmHg	<80 mmHg
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

Need to measure BP using an oscillatory automated cuff – otherwise not generalizable to the SPRINT study

Clinical Algorithm – Manage

Blood Pressure

Urine ACR

CKD
+ DM

**If > 130/80 – treat
HTN based on HTN
Canada Guidelines**

**If > 3 - Treat with
ACEI or ARB (but
watch for
hypotension)**

CKD
(Non-
DM)

If > 135/85 – treat
HTN based on HTN
Canada Guidelines

If > 30 AND BP > 135/85
– Treat HTN with ACEI or
ARB (1st choice
pharmacotherapy)



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**Lytes/Cr 2 weeks
after starting ACEI
or ARB**



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Go Slow or SPRINT? – you decide



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Prevalence of CKD

- 10% of North Americans have CKD
 - 26 million people
- 25% of North Americans > age 65 have CKD
- Only 3% of CKD patients progress to ESRD



Why Should CKD Be Important to Primary Care/LTC?

- ~ 90% of CKD cases are at low risk of progression and can be followed by a Primary Care Provider (e.g. family physician, nurse practitioner); **100% in LTC**
- Early identification and treatment can prevent/delay End Stage Renal Disease (ESRD)
 - **Medication reviews can prevent AKI in LTC**
- Comorbid cardiovascular disease risk reduction/management (e.g. DM, CAD/CHF)
- Referral of patients at increased risk of progression to advanced stages of CKD to nephrology



Clinical Algorithm – Identify

IDENTIFY

Identify patients in your practice with elevated risk of CKD based on the following:

- Hypertension
- Diabetes mellitus
- Age 60 - 75 with cardiovascular disease (CV)

Added FNIM (First Nations, Inuit, Metis) > 18 years old

Do not screen if life expectancy is less than 10 years (e.g. frail elderly population)

What Tests Should Be Ordered? - Detect

- Creatinine/ eGFR
 - **Measure of kidney function**
- Urine for ACR (albumin to creatinine ratio)
 - **Measure of kidney damage/injury (protein excreted in urine)**
 - **Do not order a 24hr. urine collection**
- Important Note: CKD detection should be done in the absence of acute inter-current illness
 - Low eGFR in such scenarios may reflect AKI (acute kidney injury) and require more rapid evaluation



If The Results Are Abnormal, When Should One Repeat The CKD Screening Tests? - Detect

Assuming no inter-current illness:

- If eGFR < 60, repeat in 3 months or sooner if clinical concern
- 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 is defined as a persistent abnormality for at least 3 months



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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)
- Always consider reversible causes prior to re-testing:
 - Recent treatments with NSAIDs
 - Herbal remedies
 - Use of contrast dye for diagnostic imaging
 - Obstruction (e.g. BPH/urinary retention)
 - Volume depletion (e.g. dehydration due to illness; diuretics)
 - Consider the above any time an eGFR/Cr is ordered and the result is unexpected (e.g. annual flu vaccine; medical w/u)
- Renal ultrasound not recommended as part of routine CKD screening, but can be ordered to rule out a cause of AKI!



Interpreting The Results Three Months Later - Detect

Box C **eGFR \geq 60 and ACR $<$ 3**

- Patient does **not** have CKD

Follow-Up Recommendations:

- Re-test annually for patients with diabetes, less frequently otherwise unless clinical circumstances dictate more frequent testing
- **Avoid labeling a patient with CKD unless confirmed**



Interpreting The Results Three Months Later - Detect

Box A eGFR < 30 or ACR > 60

- Patient has CKD
- Refer patient to a nephrologist

Work-Up Recommendations:

- Consider ordering & sending the following with referral:
 - Urine R&M, electrolytes – update 2018
 - CBC, serum calcium, phosphate, albumin – update 2018
- Don't lose relationship with your patient!

Interpreting The Results Three Months Later - Detect

Box B eGFR 30-59 and/or ACR 3-60

- Patient has CKD
- Work-Up: Check urine R&M (inflammatory causes), electrolytes

Follow-Up Recommendations:

- How often do you follow-up?



KDIGO CKD Follow-up Advice

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

			Persistent albuminuria categories		
			Description and range		
			A1	A2	A3
			<30 mg/g <3 mg/mmol	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	High	High if CKD	2	2
	G2	Decreased	60-89	2	2
	G3a	Moderately decreased	45-59	3	3
	G3b	Moderately to severely decreased	30-44	3	3
	G4	Severely decreased	15-29	3	4+
	G5	Kidney failure	<15	4+	4+



Interpreting The Results Three Months Later - Detect

Box B eGFR 30-59 and/or ACR 3-60

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**



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KW Toolkit 2015: CKD Criteria for Referral

- eGFR < 30 or ACR > 60, or
 - eGFR <45 and urine ACR between 30 and 60 on 2 occasions, at least 3 months apart, or
 - eGFR < 60 and decline \geq 5ml/min within 6 months (confirmed on repeat testing within 2-4 weeks)
-
- Unfortunately, there has been ongoing misinterpretation/misuse of the latter two criteria in primary care

KFRE – Kidney Failure Risk Equation

- Uses demographic and lab information to calculate risk of kidney disease progression resulting in kidney failure and need for renal replacement therapy (e.g. dialysis or transplant) in patients with CKD stages 3-5.
- Abbreviated KFRE consists of 4 variables - age, sex, eGFR and urine ACR
- www.kidneyfailurerisk.com

KFRE

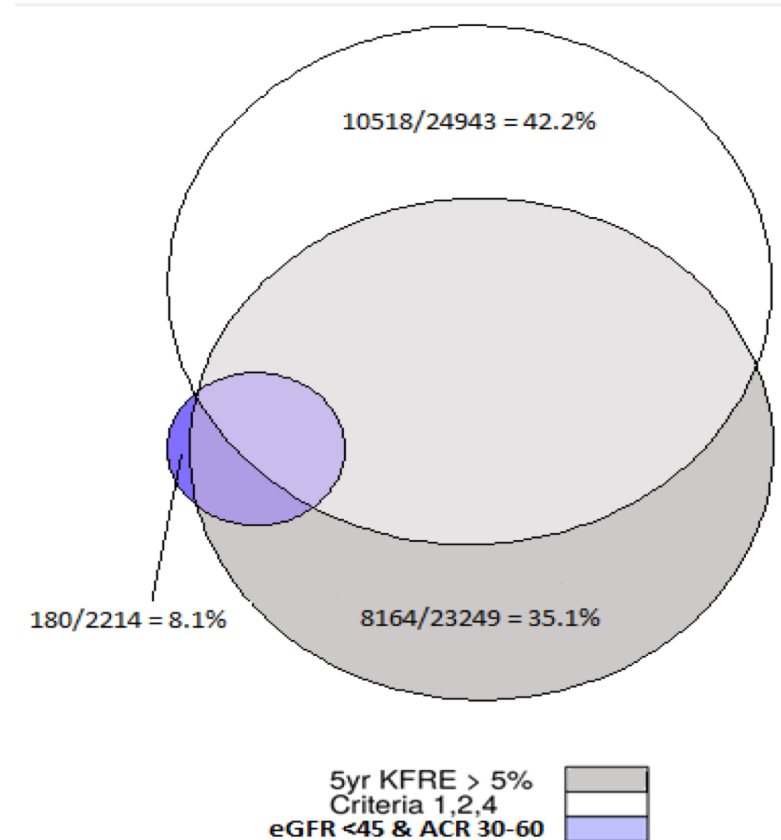
- Calgary, Manitoba and Halifax have implemented a model of care using KFRE as a key criterion to inform referral from PCP to nephrology
- ICES analysis conducted to identify number/proportion of patients meeting one or more of the KidneyWise referral criteria, and how these criteria compare with pre-selected KFRE thresholds
 - 2-year KFRE \geq 10%
 - **5-year KFRE \geq 5%**
 - 5-year KFRE \geq 3%
 - 5-year KFRE \geq 10%
- ORN convened a working group of nephrologists and 1 PCP to review the ICES analysis and provide recommendations

KFRE Inclusion Working Group Members

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

Relationship Between 5-year KFRE & Existing KW Criteria

- Out of 2214 people meeting the eGFR <45 and ACR between 30-60 criterion, only 180 (8.1%) are not captured by the 5-year KFRE $\geq 5\%$
- Additionally, 8164 people with a 5-year KFRE $\geq 5\%$ are not captured by existing KidneyWise criteria (high risk)



Proposed Recommendations: KFRE

1. Include new KFRE threshold referral criterion: PCPs consider referring patients if their 5-year KFRE is $\geq 5\%$

Rationale

- Captures higher risk patients currently missed by existing criteria.
- When used in conjunction with lab reporting/messaging can better highlight those patients at lower vs. higher risk of progression

Proposed Recommendations: KFRE

2. Remove referral criterion: eGFR <45 and urine ACR between 30 and 60 on 2 occasions, at least 3 months apart

Rationale

- This referral criterion is often misunderstood, requires 4 values, and occurs infrequently
- Vast majority of such patients will be captured by the 5-year KFRE $\geq 5\%$ criterion

Proposed Recommendations: KFRE

3. Include more explicit messaging for the following referral criterion: eGFR <60 & $>5\text{ml/min}$ decline within 6 months (confirmed on repeat testing within 2 to 4 weeks), to improve the interpretation of this criterion

Rationale

- This criterion is almost always prompted by 2 rather than the required 3 eGFR values to prompt a referral
- PCPs rarely conduct a repeat test within 2-4 weeks

Proposed Recommendations: KFRE

4. Focus on education and knowledge translation to introduce and familiarize KFRE to PCPs

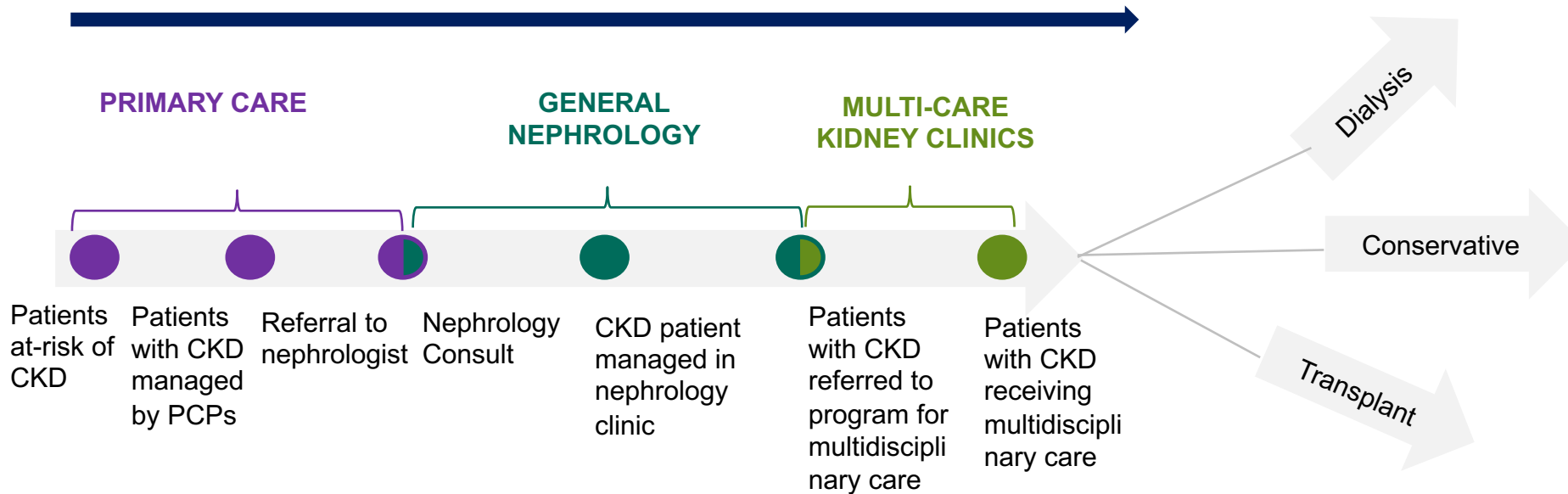
Rationale

- We will utilize the opportunity to work with community labs to auto-calculate KFRE and highlight when referrals would be appropriate

Summary of CKD Criteria for Referral to Nephrology

Criteria	Status
eGFR < 30 ml/min/1.73m ² on 2 occasions, at least 3 months apart	No change
Proteinuria (urine ACR > 60 mg/mmol on at least 2 of 3 occasions), present for > 3 months	No change
eGFR < 60 ml/min/1.75m ² and decline ≥ 5ml/min within 6 months (confirmed on repeat testing within 2-4 wks)	Wording to be updated
5-year KFRE is ≥ 5%	New

Simplified CKD Patient Pathway



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

Hot Off The Press: CFP – October 2018 – pg. 728-735



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.

Acknowledgements

Name	Title
Dr. Scott Brimble	Provincial Medical Lead, CKD Care, ORN
Dr. Allan Grill	Provincial Medical Lead, Primary Care, ORN
Marnie MacKinnon	Director, Integrated Care, ORN
Tachiwa Murray	Senior Specialist, Primary Care Portfolio, ORN



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Conclusions

- The use of an electric oscillometric automated BP device is the preferred method to measure BP and diagnose HTN
- Intense HTN treatment in the elderly (> 75 y.o.) targeting a SBP of < 120 mmHg showed benefit re: reduction in the primary composite CV events outcome (non-fatal MI, ACS, stroke, CHF, CV-related death)
- SPRINT trial excluded patients with diabetes, LTC residents, history of stroke
- Generalizability of frailty level of patients in the SPRINT trial questionable
- Polypharmacy remains a risk factor for adverse drug events
- Take the time to discuss the pros and cons with patients re: treatment targets and goals of care (e.g. life expectancy)



Conclusions

- Kidney Failure Risk Equation is a good predictor for measuring the probability of progressing to End-Stage Renal Disease in patients with Stage 3-5 CKD
- Age, sex, eGFR, urine ACR
- KFRE 5-year, 5% probability added to the KidneyWise Clinical Toolkit referral criteria
- https://qxmd.com/calculate/calculator_308/kidney-failure-risk-equation-4-variable
- Check out www.kidneywise.ca for updates on the KidneyWise Clinical Toolkit for Primary Care



Questions?



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