

# AN UPDATE ON HYPERTENSION MANAGEMENT IN OLDER ADULTS

RGP of Toronto Webinar

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# DISCLOSURES

- No conflicts of interest to disclose.

# OBJECTIVES

1. To review the burden of disease of hypertension.
2. To become familiar with (some of the) current guidelines from Hypertension Canada and the underlying evidence.
3. To recognize the unique considerations in managing hypertension in older adults.

# POLL 1

What is your professional role?

- A. Dietitian
- B. Nurse
- C. Occupation therapist
- D. Pharmacist
- E. Physician
- F. Physiotherapist
- G. Social worker
- H. Speech language pathologist
- I. Other

## POLL 2

What is the prevalence of HTN in adults age >65 in the U.S.?

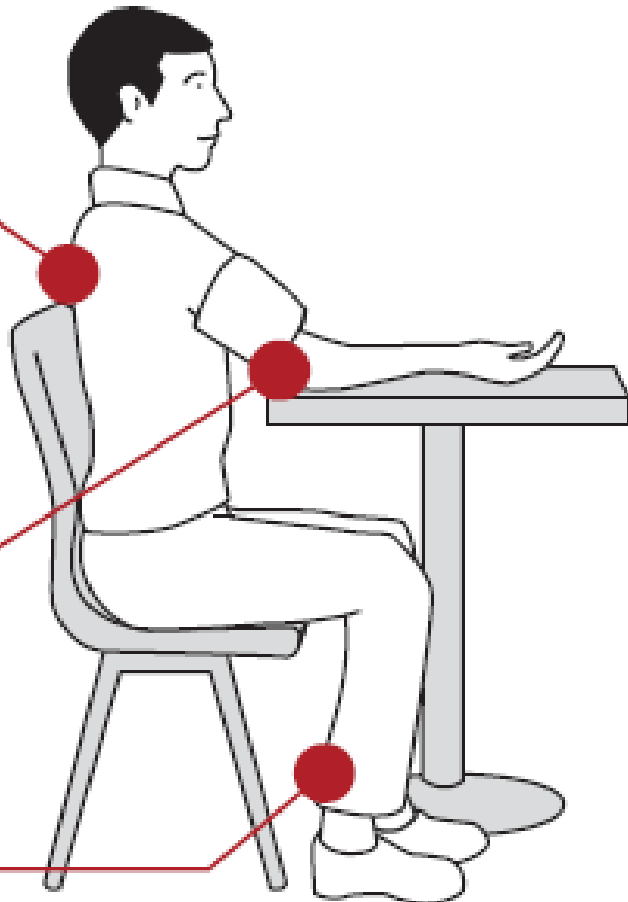
- A. 25%
- B. 50%
- C. 75%
- D. 90%

# HYPERTENSION

- Leading cause of death and disability
- #1 reason for physician visits, over 20M annually
- #1 reason for Rx, over 80M annually
- Estimated total cost \$13B annually, predicted \$20B by 2020

# Accurate diagnosis begins with accurate measurement:

- ✓ Sitting position
- ✓ Back supported
- ✓ Arm bare and supported
- ✓ Use a cuff size appropriate for your arm
- ✓ Middle of the cuff at heart level
- ✓ Lower edge of cuff 3 cm above elbow crease
- ✓ Do not talk or move before or during the measurement
- ✓ Legs uncrossed
- ✓ Feet flat on the floor



- Automated office BP (AOBP) is preferred for in-office measurement
- Rest for 5 mins; measure at 1-2 min intervals and take average of cycles
- After first measure, patient should be left alone

## TAKE HOME MESSAGE #1

Hypertension in older adults is very common and has a substantial impact on morbidity, mortality, and economic costs.



## CASE: MS. H

- 82F referred for cognitive impairment
- PMH: HTN, DLD, right TKA for OA
- Meds: HCTZ 12.5<sup>l</sup>, rosuvastatin 10<sup>HS</sup>
- Lives in apartment with husband, independent ADLs/IADLs
- Supine HR 74, BP 132/73 → standing HR 80, BP 125/69
- MoCA 27/30
- Exam, labs, ECG, imaging unremarkable

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Poll 3: Are we satisfied with her BP control?

# HYPERTENSION CANADA 2018 GUIDELINES

## *IV. Global vascular protection therapy for adults with hypertension without compelling indications for specific agents*

- 5. For **high-risk patients**, aged 50 years or older, with SBP levels  $\geq 130$  mmHg, intensive management to **target a SBP  $\leq 120$  mmHg should be considered...** Patient selection for intensive management is recommended and caution should be taken in certain high-risk groups (Table 5; Grade B).*

# HYPERTENSION CANADA 2018 GUIDELINES

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

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Clinical or subclinical cardiovascular disease

or

Chronic kidney disease (nondiabetic nephropathy, proteinuria < 1 g/d, estimated glomerular filtration rate 20-59 mL/min/1.73 m<sup>2</sup>)\*

or

Estimated 10-year global cardiovascular risk ≥ 15%<sup>†</sup>

or

Age ≥ 75 years

Patients with ≥ 1 clinical indications should consent to intensive management

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\* Four-variable Modification of Diet in Renal Disease equation.

<sup>†</sup> Framingham Risk Score.<sup>59</sup>

# HYPERTENSION CANADA 2018 GUIDELINES

**Table 5. Generalizability of intensive blood pressure-lowering in adults: cautions and contraindications**

Limited or no evidence

- Heart failure (left ventricular ejection fraction < 35%) or recent myocardial infarction (within past 3 months)
- Indication for, but not currently receiving, a  $\beta$ -blocker
- Institutionalized elderly patients

Inconclusive evidence

- Diabetes mellitus
- Previous stroke
- eGFR < 20 mL/min/1.73 m<sup>2</sup>

Contraindications

- Patient unwilling or unable to adhere to multiple medications
- Standing SBP < 110 mm Hg
- Inability to measure SBP accurately
- Known secondary cause(s) of hypertension

*The* NEW ENGLAND  
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A Randomized Trial of Intensive versus  
Standard Blood-Pressure Control

The SPRINT Research Group\*

# SYSTOLIC BLOOD PRESSURE INTERVENTION TRIAL (SPRINT)

## Inclusion criteria

- Age  $\geq 50$  years
- SBP 130-180 mmHg
- Increased risk of CVD based on any one of:
  - Age  $\geq 75$  years
  - Clinical or subclinical CVD
  - 10-year Framingham General CVD risk  $\geq 15\%$
  - CKD with eGFR 20-59 mL/min/1.73 m<sup>2</sup>

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  - 10-year Framingham General CVD risk  $\geq 15\%$
  - CKD with eGFR 20-59 mL/min/1.73 m<sup>2</sup>, non-diabetic nephropathy, proteinuria  $< 1$  g/24 h

Same criteria adopted by Hypertension Canada for “high-risk”



# SYSTOLIC BLOOD PRESSURE INTERVENTION TRIAL (SPRINT)

## Exclusion criteria

- DM
- CVA
- secondary cause of hypertension
- SBP <110 mmHg after 1 min of standing
- proteinuria
- PKD
- GN
- pregnancy
- organ transplant
- CV event, procedure, or UA hospitalization in prior 3 months
- symptomatic HF within 6 months, or LVEF <35%
- expected survival of <3 years
- unintentional weight loss >10% body weight within 6 months
- poor adherence
- institutionalized

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- unintentional weight loss > 10% body weight within 6 months
- poor adherence
- institutionalized

Same cautions and CIs adopted by Hypertension Canada

# SYSTOLIC BLOOD PRESSURE INTERVENTION TRIAL (SPRINT)

Authors' conclusions:

*“[Intensive versus standard BP control] resulted in **lower rates** of fatal and nonfatal major cardiovascular events and death from any cause, although significantly **higher rates** of some adverse events [HoTN, syncope, AKI, electrolyte abnormalities].”*

## RETURN TO THE CASE: MS. H

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## RETURN TO THE CASE: MS. H

- “High-risk” given age
- Fits SPRINT population
- Hypertension Canada guideline suggests consideration of target SBP  $\leq 120$  mmHg
- Must balance with risk of hypotension, syncope, AKI, electrolyte abnormalities

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But how will BP control impact her cognition?

Research

JAMA | **Original Investigation**

# Effect of Intensive vs Standard Blood Pressure Control on Probable Dementia A Randomized Clinical Trial

The SPRINT MIND Investigators for the SPRINT Research Group

JAMA 2019; 321: 553-61

# SPRINT MIND

- Same population, intervention, and control groups as for SPRINT.
- Outcomes focused on cognition
  - Primary – probable dementia
  - Secondary – mild cognitive impairment (MCI);  
composite of MCI + probable dementia



# SPRINT MIND

## Results

- The rates of probable dementia **did not differ** between the two groups (7.2 v. 8.6 cases per 1000 person-years, HR 0.83, 95% CI 0.67-1.04)
- The rates of MCI and the composite outcome were **reduced in the intensive treatment group** (14.6 v. 18.3 cases of MCI per 1000 person-years, HR 0.81, 95% CI 0.69-0.95 20.2 v. 24.1 cases of MCI or probable dementia per 1000 person-years, HR 0.85, 95% CI 0.74-0.97)
- No evidence of negative effect (i.e. intensive control did not result in harm to cognition)

# SPRINT MIND

Authors' conclusions:

*“[Intensive versus standard BP control] did not result in a significant reduction in the risk of probable dementia. Because of early study termination and fewer than expected cases of dementia, the study may have been underpowered for this end point.”*

## RETURN TO THE CASE: MS. H

- “High-risk” given age
- Fits SPRINT population
- Hypertension Canada guideline suggests consideration of target SBP  $\leq 120$  mmHg
- Must balance with risk of hypotension, syncope, AKI, electrolyte abnormalities
- Likely will not negatively impact her cognition; *may provide benefit*

## TAKE HOME MESSAGE #2

Treatment targets for hypertension should be individualized to the older adult.

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Poll 4: Is the choice of antihypertensive (HCTZ) appropriate?

# HYPERTENSION CANADA 2018 GUIDELINES

*III. Choice of therapy for adults with hypertension without compelling indications for specific agents*

*I. Initial therapy should be with either **monotherapy** or **single pill combination** (SPC).*

*i. Recommended monotherapy choices are:*

*a. thiazide/thiazide-like diuretic (Grade A), with longer-acting diuretics preferred (Grade B),*

## CHOICE OF DIURETIC

- e.g. **chlorthalidone** 6.25 mg or **indapamide** 1.25 mg over HCTZ 12.5 mg
- Meta-analysis ( $N = 21$ ) of thiazides or thiazide-like v. placebo:
  - Both thiazides and thiazide-like diuretics reduced CV events, CVA, heart failure
  - Only thiazide-like diuretics also reduced coronary events, all-cause mortality
- RCT ( $N = 54$ ) comparing chlorthalidone v. HCTZ v. HCTZ CR:
  - Chlorthalidone more effective at lowering SBP and DBP than HCTZ



## SINGLE PILL COMBINATION



- Now first-line agent, regardless of severity of HTN
- Recommended options are:
  - ACE-I + CCB, or
  - ARB + CCB (e.g. candesartan + amlodipine = Twynsta™), or
  - ACE-I/ARB + diuretic (e.g. perindopril + indapamide = Coversyl Plus™, candesartan + HCTZ = Atacand Plus™)

## SINGLE PILL COMBINATION


- Meta-analysis ( $N = 12$ ) of SPCs v. free-equivalent components:
  - SPC associated with better adherence
- Randomized trial using SPC as part of a simplified treatment algorithm (STITCH study):
  - Regimen with initial SPC leads to better BP control

- Meta-analysis
- SPC assessment
- Randomized controlled trial (STITCH)
- Regimen

← Tweet

 **Joel Topf, MD FACP**   
@kidney\_boy

This tweet is my spirit animal

 **Shweters** @Shweters · 5d  
Replying to @VijayanMD @hswapnil and 4 others  
Wish Chlorthalidone came in a combo pill with ACEI/ARB

gorithm

## TAKE HOME MESSAGE #3

Consider both effectiveness and ease of adherence when choosing antihypertensive agents.

## POLL 5

Ms. H is admitted to hospital with a wrist fracture. Her BP measurements are elevated to the 170s/90s despite adequate pain control. What should we do with her antihypertensive medication?

- A. Intensify medication(s) to lower BP to target
- B. Monitor BP while continuing to address contributing factors
- C. Need more information

# Intensification of older adults' outpatient blood pressure treatment at hospital discharge: national retrospective cohort study

Timothy S Anderson,<sup>1</sup> Charlie M Wray,<sup>2</sup> Bocheng Jing,<sup>3</sup> Kathy Fung,<sup>3</sup> Sarah Ngo,<sup>3</sup> Edison Xu,<sup>3</sup> Ying Shi,<sup>3</sup> Michael A Steinman<sup>4</sup>

# INTENSIFICATION OF BP TREATMENT AT HOSPITAL DISCHARGE

## Results

- 14% of patients discharged with new or higher dose antihypertensive agents compared to admission.
- No difference in rates of intensification between those most likely to benefit (e.g. history of CVD) and those least likely (e.g. limited life expectancy, dementia, metastatic cancer).
- Elevated inpatient BP strongly associated with intensification while pre-admission outpatient BP control not predictive.

# INTENSIFICATION OF BP TREATMENT AT HOSPITAL DISCHARGE

Authors' conclusions:

*“More attention is needed to reduce potentially harmful overtreatment of blood pressure as older adults transition from hospital to home.”*



## TAKE HOME MESSAGE #4

Avoid reflexive intensification of antihypertensive medications when patients are admitted to hospital.

## TAKE HOME MESSAGE #4

Avoid reflexive intensification of antihypertensive medications when patients are admitted to hospital.

*“Overall, clinicians would be wise to adopt Sin City’s famous tagline, ‘What happens in Vegas, stays in Vegas;’ often the safest approach to inpatient chronic disease management should be to let what happens in hospital stay in hospital.”*

## SUMMARY

1. Hypertension in older adults is very common and has a large impact on morbidity, mortality, and economic costs.
2. Treatment targets for hypertension should be individualized to the older adult.
3. Consider both effectiveness and ease of adherence when choosing antihypertensive agents.
4. Avoid reflexive intensification of antihypertensive medications when patients are admitted to hospital.

QUESTIONS OR COMMENTS?

# REFERENCES

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**SUPPLEMENTARY SLIDES**

## PRIOR TRIALS

- HYVET: reduction in fatal CVA, all-cause mortality, and CV outcomes in patients age  $\geq 80$  with SBP  $< 150/80$
- ACCORD-BP: no reduction in nonfatal MI, nonfatal CVA, or CV mortality in patients with DM with SBP  $< 120$  v.  $< 140$
- SPS3-BP: no reduction in recurrent CVA in patients with recent lacunar CVA with SBP  $< 130$  v.  $< 150$

N Engl J Med 2008; 358: 1887-98  
N Engl J Med 2010; 362: 1575-85  
The Lancet 2013; 382: 507-15

# SYSTOLIC BLOOD PRESSURE INTERVENTION TRIAL (SPRINT)

## Question

- Population – patients at high risk for CVD without Hx of CVA or DM
  - 28% in both arms age  $\geq 75$  years
- Intervention – intensive BP control (target SBP  $< 120$  mmHg)
- Control – standard BP control (target SBP 135-139 mmHg)
- Outcomes
  - primary – composite outcome of MI, other ACS, CVA, acute decompensated heart failure, or CV death
  - secondary – all-cause mortality; composite of primary + all-cause mortality
  - serious adverse events – HoTN, syncope, injurious falls, electrolyte abnormalities, AKI, bradycardia



# SYSTOLIC BLOOD PRESSURE INTERVENTION TRIAL (SPRINT)

## Methods

- Multicentre (102 sites) in United States, including Puerto Rico
- Randomized, controlled, open-label
- $N = 9361$
- Choice of antihypertensive at investigators' discretion
- Planned average followup 5 years; terminated early at 3.26 years as interim analysis demonstrated superiority of intensive therapy

# SYSTOLIC BLOOD PRESSURE INTERVENTION TRIAL (SPRINT)

## Results

- Intensive BP control associated with **fewer primary outcome events** (5.2% vs. 6.8%,  $P < 0.001$ , NNT 63) and **reduction in all-cause mortality** (3.3% vs. 4.5%,  $P = 0.003$ , NNT 83), including in subgroup age  $\geq 75$  years
- No difference in composite endpoint of serious adverse events, but intensive BP control associated with **more HoTN, syncope, electrolyte abnormalities, and AKI** (not injurious falls or bradycardia)

Primary: composite outcome of MI, other ACS, CVA, acute decompensated heart failure, or CV death

# SYSTOLIC BLOOD PRESSURE INTERVENTION TRIAL (SPRINT)

## Limitations

- Excluded patients with survival  $\leq 3$  years, institutionalized
- In the control arm, 87% of patients required  $\geq 1$  reduction in dose of Rx
- Early termination may have exaggerated intervention effect
- Intensive control had higher pill burden
- NNH 46 for a serious adverse event
- Intracranial hypoperfusion linked to cognitive decline in the older adults; SPRINT followup likely too short to detect change in cognitive status

# SPRINT MIND

## Methods

- Randomized, controlled, open-label,  $N = 9361$
- Cognitive screening assessments at baseline, 2 years, 4 years, and/or closeout visits
  - MoCA; Logical Memory forms I and II of Wechsler Memory Scale; Digit Symbol Coding Test of Wechsler Adult Intelligence Scale; Functional Activities Questionnaire; Modified Telephone Interview for Cognitive Status; Trail Making Test Parts A and B; etc.
- Median intervention period of 3.34 y, median follow-up of 5.11 y

# SPRINT MIND

## Inclusion criteria

- Age  $\geq 50$  years
- SBP 130-180 mmHg
- Increased risk of CVD based on any one of:
  - Age  $\geq 75$  years
  - Clinical or subclinical CVD (= CAD, HF, LVH, or LV dysfunction)
  - 10-year Framingham General CVD risk  $\geq 15\%$
  - CKD with eGFR 20-59 mL/min/1.73 m<sup>2</sup>

Same as SPRINT

# SPRINT MIND

## Exclusion criteria

- DM
- CVA
- Residing in a nursing home
- Diagnosis of dementia based on medical record review
- Treated with medications primarily used for dementia therapy

# SPRINT MIND

## Limitations

- Early termination, thus attenuation of SBP difference between groups
- Loss to follow-up may have underestimated outcomes
- Exclusion criteria; lower than expected incidence of dementia