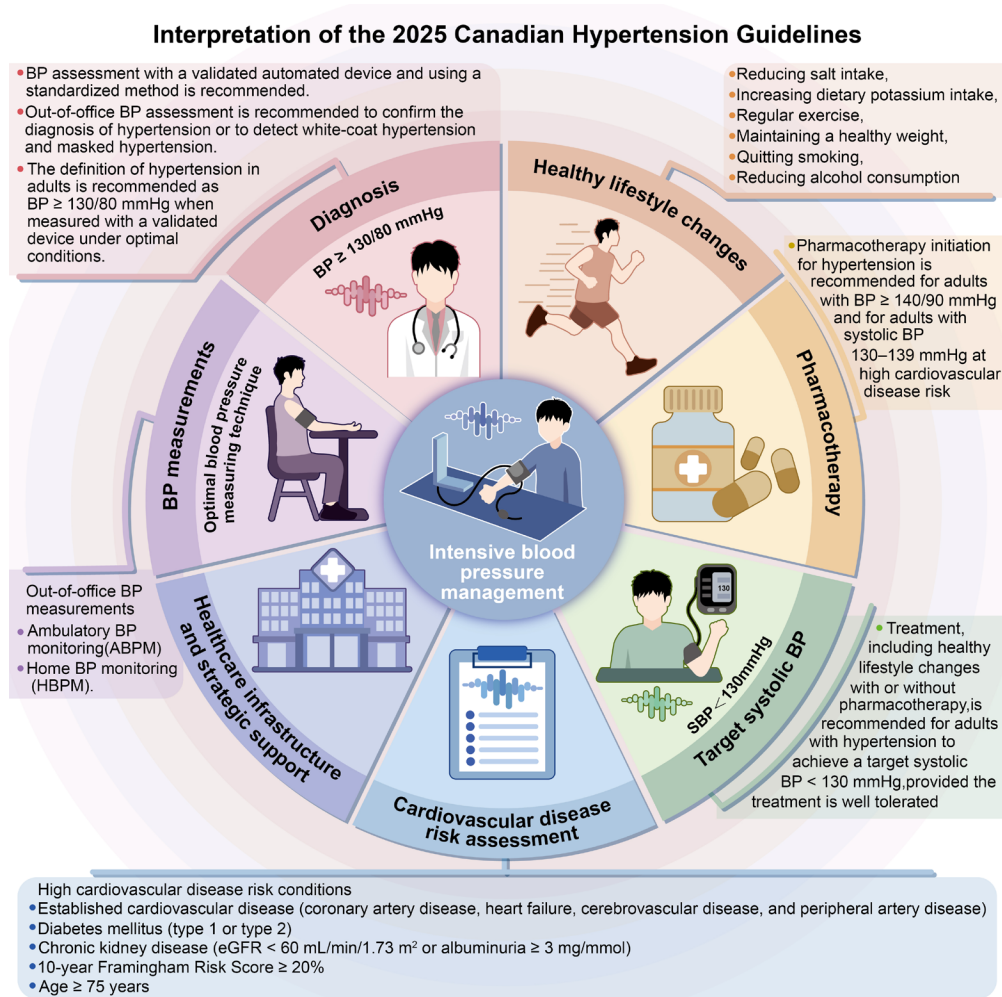


# Frontline advancement

## Insights from the 2025 Canadian Hypertension Guidelines

Ning Yang, MD, PhD<sup>a,\*</sup>

### Graphical abstract



<sup>a</sup> Department of Hypertension, Tianjin Kanghui Hospital, Tianjin, China

\* Correspondence: Ning Yang, Department of Hypertension, Tianjin Kanghui Hospital, Tianjin 300380, China (e-mail: yangningzxd@sina.com).

Copyright © 2025 by the Authors, published by Wolters Kluwer Health, Inc. on behalf of Higher Education Press. This is an open access article distributed under the Creative Commons Attribution License 4.0 (CCBY), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Cardiac Research (2025) 1:1

Received: 12 June 2025 / Received in final form: 7 September 2025 / Accepted: 7 September 2025

<http://dx.doi.org/10.1097/re9.0000000000000007>

In May 2025, Canada officially released the “Hypertension Canada Guideline for the Diagnosis and Treatment of Hypertension in Adults in Primary Care.”<sup>[1]</sup> Historically, Canada has been a global leader in hypertension management; however, treatment and control rates have declined in recent years. This guideline aims to provide practical primary care recommendations to improve hypertension management for adults at the population level.

Based on current research evidence, the new guideline provides a comprehensive review and recommendations for the diagnosis and treatment of hypertension. Its 9 recommendations for managing hypertension in adults

are divided into diagnosis and treatment categories. Compared with Hypertension Canada's 2018 Guidelines for the Diagnosis, Risk Assessment, Prevention, and Treatment of Hypertension in Adults and Children,<sup>[2]</sup> the most significant update in this guideline is the redefinition of the diagnostic criteria for hypertension.

Regarding the diagnosis of hypertension, the guideline proposes 3 recommendations: First, it is recommended to use validated automated devices with a standardized method for blood pressure (BP) assessment. Second, it recommends out-of-office BP measurement to confirm the diagnosis of hypertension or to detect white-coat hypertension and masked hypertension. Third, hypertension in adults is defined as a BP  $\geq$  130/80 mmHg, measured using validated devices under optimal conditions. Notably, the Canadian guidelines also stress standardized BP measurement and out-of-office readings. Combining these approaches offers a "truer" representation of a patient's BP, improving safety during intensive treatment.

Regarding hypertension management, the guidelines strongly recommend lifestyle modifications for adults with BP between 130–139/80–89 mmHg. These include reducing salt intake, increasing physical activity, maintaining a healthy weight, quitting smoking, and limiting alcohol consumption. Adults within this BP range who have a higher risk of cardiovascular disease (CVD) should initiate pharmacological treatment. For those with systolic blood pressure (SBP) at 130–139 mmHg but a lower cardiovascular risk, lifestyle adjustments may be sufficient. BP should be reassessed after 3–6 months and 6–12 months, respectively. Medication should complement lifestyle changes rather than replace them, as successful lifestyle modifications can reduce or discontinue medication.<sup>[1]</sup>

Canada's redefinition of the diagnostic criteria is based on the accumulation of evidence from evidence-based medicine in recent years. The group most significantly impacted by this new guideline is individuals with BP levels of 130–139/80–89 mmHg. Under the 2018 Canadian guideline standard (140/90 mmHg), this group was not diagnosed with hypertension. However, according to the 2025 guideline, these individuals are now diagnosed with hypertension and will gain access to greater healthcare support at the societal level.

The population with BP ranging from 130–139/80–89 mmHg is crucial for the early prevention and control of CVD. This group exhibits an objective cardiovascular risk. As outlined in the guidelines,<sup>[1]</sup> this adjustment is supported by observational studies and randomized controlled trials (RCTs) evidence linking BP levels to cardiovascular risk. Meta-analyses of prospective studies indicate that individuals with BP  $\geq$  130–139/85–89 mmHg face a 1.5 to 2.0 times greater relative risk of major adverse cardiovascular events compared with those with BP < 120/80 mmHg. Additionally, their risk remains significantly elevated relative to individuals with BP levels of 120–129/80–84 mmHg. Multiple large prospective cohort studies in Chinese populations have yielded similar findings.<sup>[3–6]</sup> Similarly, RCT data on the

effects of more intensive BP-lowering treatments have consistently shown their effectiveness in reducing the risk for major adverse cardiovascular events for people with BP  $\geq$  130/80 mmHg (and in some cases for people with BP < 130/80 mmHg).<sup>[1]</sup>

The Canadian hypertension guideline reduction of the diagnostic threshold provides valuable insights for hypertension prevention and management in China. Estimates from relevant studies suggest that individuals with SBP of 130–139 mmHg and/or diastolic blood pressure of 80–89 mmHg constitute 23.2% of Chinese adults aged 18 and above, totaling approximately 245 million. This BP range is predominantly found in young and middle-aged adults (18–54 years).<sup>[7–9]</sup> A longitudinal study of normotensive Chinese adults (aged 35–64) revealed that individuals with baseline BP in the 130–139/80–89 mmHg range had a progression rate of 65% to BP  $\geq$  140/90 mmHg within 15 years. Their risk of CVD incidence is 3.01 times higher than that of individuals whose BP remains below 130/80 mmHg.<sup>[3]</sup> Furthermore, according to China's current diagnostic criteria for hypertension (BP  $\geq$  140/90 mmHg), masked hypertension (daytime ambulatory BP  $\geq$  135/85 mmHg) among individuals with clinic BP readings of 130–139/80–89 mmHg requires particular attention. Studies have confirmed that approximately 30% of this population has masked hypertension, whether diagnosed by ambulatory BP monitoring or home BP measurements. Importantly, these individuals face significantly higher cardiovascular risks compared with those without masked hypertension.<sup>[10]</sup>

Current international hypertension management guidelines emphasize the importance of stringent BP control. High-risk individuals, including those with diabetes, coronary artery disease, or cerebrovascular diseases, and younger patients, are broadly encouraged to achieve target BP levels below 130/80 mmHg. The 2024 European Society of Cardiology guidelines even suggest more stringent goals of 120–129/70–79 mmHg for patients with baseline BP of 140/90 mmHg or higher, provided they are well-tolerated. In managing elderly patients, the 2017 American College of Cardiology/American Heart Association (ACC/AHA) guidelines recommended maintaining a BP below 130/80 mmHg for all individuals aged 65 and older. However, the 2023 ESH guidelines have adopted a tiered approach: starting with targets of < 140/80 mmHg for patients aged 65 to 79, which can be lowered to < 130/80 mmHg if well-tolerated; and relaxed to 140–150 mmHg for those 80 and above. For patients with chronic kidney disease, the ESH guidelines suggest a more lenient target of < 140/90 mmHg, whereas the ACC/AHA recommends < 130/80 mmHg.<sup>[11–13]</sup> When setting target values for elderly and chronic kidney disease patients, European guidelines highlight the importance of individualized adjustments based on patient tolerance and potential risks, while American and Canadian guidelines tend to favor stricter BP control.

Several randomized trials support intensive blood-pressure lowering. SPRINT (Systolic Blood Pressure

Intervention Trial) and STEP (Strategy of Blood Pressure Intervention in the Elderly Hypertensive Patients) demonstrated cardiovascular benefit with lower SBP targets in high-risk adults, while BPROAD (Blood Pressure Control Target in Diabetes) extended benefit to patients with type 2 diabetes. An individual-participant data analysis pooling 6 pivotal trials—SPRINT, STEP, BPROAD, plus ACCORD BP (Action to Control Cardiovascular Risk in Diabetes Blood Pressure), CRHCP (China Rural Hypertension Control Project), and ESPRIT (Effects of Intensive Systolic Blood Pressure Lowering Treatment in Reducing Risk of Vascular Events)—showed a net clinical benefit of intensive versus standard control (fewer cardiovascular events despite more adverse events), with broadly consistent effects across older adults and people with diabetes.<sup>[14]</sup> Taken together,<sup>[15–18]</sup> intensive SBP targets can be cardioprotective across high-risk groups, with target selection individualized to tolerance, comorbidities, and explicit benefit-harm trade-offs.

Adjusting the diagnostic thresholds for hypertension will significantly increase the number of individuals requiring treatment and management, posing substantial challenges to global healthcare systems. This shift has become a critical sociological and economic consideration for countries as they revise their hypertension diagnostic criteria. Current evidence suggests that policies such as expanding medical subsidies and enhancing insurance coverage can improve medication adherence and enhance hypertension control and management.<sup>[19]</sup> For instance, Kaiser Permanente in Northern California boosted its hypertension control rate from 44% to 90% by promoting combination monopills and convenient follow-up services.<sup>[20]</sup> However, the successful implementation of lower diagnostic thresholds heavily relies on the development of healthcare infrastructure and strategic support. Changes to Canadian guidelines also present challenges to their hypertension prevention system. A study involving 4 million adults across 104 countries indicated that lowering the diagnostic threshold from  $\geq 140/90$  mmHg to  $\geq 130/80$  mmHg would increase the global prevalence of hypertension by 72.3%, resulting in more people being diagnosed and treated.<sup>[21]</sup> For low-income countries with already low treatment and control rates, expanding diagnostic coverage would exacerbate their healthcare pressures.

However, in clinical practice, guidelines from various countries, including China, exhibit inconsistent standards regarding diagnostic thresholds and the initiation of pharmacotherapy. The Canadian guidelines strongly advocate for active lifestyle interventions for adults with BP levels ranging from 130–139/80–89 mmHg. For individuals presenting with these BP readings, medication is generally reserved for those at high risk of cardiovascular issues or with comorbid conditions, whereas low-risk cases are primarily managed through enhanced lifestyle modifications. Consequently, reducing diagnostic thresholds does not necessitate the automatic prescription of medication for all newly diagnosed patients. Instead, it requires the development of tailored intervention strategies based on individual risk stratification.<sup>[1]</sup>

This treatment approach imposes a minimal financial burden on individuals or the government while significantly reducing the incidence of stroke and other major adverse cardiovascular events, along with their associated mortality and disability rates. Is pharmacological treatment cost-effective for individuals with BP of 130–139/80–89 mmHg? According to the 2017 ACC/AHA hypertension guidelines, only 22.7% of Chinese adults aged 35 and older with SBP of 130–139 mmHg and/or diastolic blood pressure of 80–89 mmHg—those with comorbidities or high cardiovascular risk—require anti-hypertensive medication.

A study assessing the benefits and cost-effectiveness of antihypertensive therapy in Chinese individuals aged 35 and older, with BP levels ranging from 130–139/80–89 mmHg and a higher risk of CVD, found that medication could prevent approximately 2.06 million strokes and 660,000 myocardial infarctions over a decade. Patients gained 0.034 quality-adjusted life years (QALYs), with early treatment showing greater benefits in preventing CVDs and achieving QALYs. The incremental cost-effectiveness ratio for each additional QALY was 13,321.29 pounds, indicating strong cost-effectiveness.<sup>[22]</sup> Following centralized procurement, hypertension medications experienced significant price reductions—previously included drugs in two batches saw defined daily cost prices decrease by 40% to 97.6%.<sup>[23]</sup>

Therefore, it is imperative to enhance public awareness about the cardiovascular risks associated with BP exceeding 130/80 mmHg and to implement proactive intervention measures. Emphasizing the CVD risk within the 130–139/80–89 mmHg BP range and actively increasing public awareness of the dangers associated with this BP level is consistent with the principle of prioritizing prevention and shifting prevention efforts earlier in the management of major chronic diseases. The publication of Canada's primary care hypertension guideline suggests that the concept of intensive BP management is gaining broader acceptance among scholars, and stricter BP control has become an inevitable trend.

### Acknowledgements

Not applicable.

### Ethical statements

Not applicable.

### Conflicts of interest

The author has no conflicts of interest to disclose.

### Funding source

Not applicable.

### Data availability statement

Data sharing is not applicable to this article as no datasets were generated or analyzed during the current study.

## Author contributions

Ning Yang wrote the manuscript, reviewed and revised the paper.

## References

- [1] Goupil R, Tsuyuki RT, Santesso N, et al. Hypertension Canada guideline for the diagnosis and treatment of hypertension in adults in primary care. *CMAJ*. 2025;197:E549–64.
- [2] Nerenberg KA, Zarnke KB, Leung AA, et al.; Hypertension Canada. Hypertension Canada. Hypertension Canada's 2018 Guidelines for diagnosis, risk assessment, prevention, and treatment of hypertension in adults and children. *Can J Cardiol*. 2018;34:506–25.
- [3] Qi Y, Han X, Zhao D, et al. Long-term cardiovascular risk associated with stage 1 hypertension defined by the 2017 ACC/AHA hypertension guideline. *J Am Coll Cardiol*. 2018;72:1201–10.
- [4] Liu S, Wang Y, Xie Y, et al. The association of stage 1 hypertension defined by the 2017 ACC/AHA hypertension guideline and subsequent cardiovascular events among adults <50 years. *J Hum Hypertens*. 2020;34:233–40.
- [5] Wu S, Xu Y, Zheng R, et al. Hypertension defined by 2017 ACC/AHA Guideline, ideal cardiovascular health metrics, and risk of cardiovascular disease: a nationwide prospective cohort study. *Lancet Reg Health West Pac*. 2022;20:100350.
- [6] Liuxin LI, Chenrui Z, Liming L, et al. Impact of different blood pressure levels on the risk of early-onset stroke in young adults. *Chin J Hypertension*. 2022;30:1061–8.
- [7] Wang Z, Chen Z, Zhang L, et al.; China Hypertension Survey Investigators. Status of hypertension in China: results from the China hypertension survey, 2012–2015. *Circulation*. 2018;137:2344–56.
- [8] Wang Z, Hao G, Wang X, et al.; China hypertension survey investigators. Clinical outcomes and economic impact of the 2017 ACC/AHA Guidelines on hypertension in China. *J Clin Hypertens (Greenwich)*. 2019;21:1212–20.
- [9] Ma S, Yang L, Zhao M, Magnussen CG, Xi B. Trends in hypertension prevalence, awareness, treatment and control rates among Chinese adults, 1991–2015. *J Hypertens*. 2021;39:740–8.
- [10] Brguljan-Hitij J, Thijs L, Li Y, et al.; International Database on Ambulatory Blood Pressure in Relation to Cardiovascular Outcome Investigators. Risk stratification by ambulatory blood pressure monitoring across JNC classes of conventional blood pressure. *Am J Hypertens*. 2014;27:956–65.
- [11] Vemu PL, Yang E, Ebinger JE. Moving Toward a Consensus: comparison of the 2023 ESH and 2017 ACC/AHA Hypertension Guidelines. *JACC: Advances*. *JACC Adv*. 2024;3:101230.
- [12] McCarthy CP, Bruno RM, Brouwers S, et al. 2024 ESC Guidelines for the management of elevated blood pressure and hypertension. *Eur Heart J*. 2024;45:3912–4018.
- [13] Whelton PK, Carey RM, Aronow WS, et al. 2017 ACC/AHA/AAPA/ABC/ACPM/AGS/APhA/ASH/ASPC/NMA/PCNA guideline for the prevention, detection, evaluation, and management of high blood pressure in adults: a report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines. *J Am Coll Cardiol*. 2018;71:e127–248.
- [14] Guo X, Sun G, Xu Y, et al.; BPRULE Study Group. Benefit-harm trade-offs of intensive blood pressure control versus standard blood pressure control on cardiovascular and renal outcomes: an individual participant data analysis of randomised controlled trials. *Lancet*. 2025;406:1009–19.
- [15] SPRINT Research Group. A randomized trial of intensive versus standard blood-pressure control. *N Engl J Med*. 2015;373:2103–16.
- [16] Zhang W, Zhang S, Deng Y, et al. Trial of intensive blood-pressure control in older patients with hypertension. *N Engl J Med*. 2021;385:1268–79.
- [17] He J, Ouyang N, Guo X, et al.; CRHCP Study Group. Effectiveness of a non-physician community health-care provider-led intensive blood pressure intervention versus usual care on cardiovascular disease (CRHCP): an open-label, blinded-endpoint, cluster-randomised trial. *Lancet (London, England)*. 2023;401:928–38.
- [18] Bi Y, Li M, Liu Y, et al. Intensive blood-pressure control in patients with type 2 diabetes. *N Engl J Med*. 2025;392:1155–67.
- [19] Zhang D, Lee JS, Pollack LM, et al. Association of Economic Policies With Hypertension Management and Control: a systematic review[C]//JAMA Health Forum. American Medical Association. *JAMA Health Forum*. 2024;5:e235231–e235231.
- [20] Jaffe MG, Young JD. The Kaiser Permanente Northern California Story: Improving hypertension control from 44% to 90% in 13 years (2000 to 2013). *J Clin Hypertens (Greenwich)*. 2016;18:260–1.
- [21] Nolde JM, Beaney T, Carnagarin R, Schutte AE, Poulter NR, Schlaich MP. Global impact of different blood pressure thresholds in 4,021,690 participants of the May measurement month initiative. *Hypertension*. 2022;79:1497–505.
- [22] Li J, Zhao D, Cai J, et al. Cost-effectiveness of treatment in adults with blood pressure of 130–139/80–89 mmHg and high cardiovascular risk in China: a modelling study. *Lancet Reg Health West Pac*. 2024;42:100962.
- [23] Wenjun S, Ziyin Z, Zheyu C, et al. A systematic review of the impact of centralized drug procurement policies on drug prices and usage. *Chin J Health Policy*. 2023;16:52–8.