

# Key insights of the Clinical Practice Guidelines for the Management of Hypertension in China

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**Abstract** In September 2024, 3 leading committees—the Chinese Society of Cardiology under the Chinese Medical Association, the Hypertension Committee of the Cross-Straits Medicine Exchange Association, and the Cardiovascular Disease Prevention and Rehabilitation Committee of the Chinese Association of Rehabilitation Medicine—jointly released the Clinical Practice Guidelines for the Management of Hypertension in China (hereinafter referred to as the “Guidelines”). These Guidelines address 44 key clinical issues closely related to the prevention and management of hypertension, offering a total of 98 evidence-based recommendations. This article highlights and provides an in-depth analysis of the 9 key insights from the Guidelines to assist physicians in better understanding its most critical content.

**Abbreviations:** ABPM = ambulatory blood pressure monitoring, ACEI = angiotensin-converting enzyme inhibitor, ARB = angiotensin receptor blocker, CCB = calcium channel blocker, CKD = chronic kidney disease, CVD = cardiovascular disease, DBP = diastolic blood pressure, eGFR = estimated glomerular filtration rate, ESC = European Society of Cardiology, GPS = good practice statement, HBPM = home blood pressure monitoring, HMOD = hypertension-mediated organ damage, OBPM = office blood pressure measurement, OSA = obstructive sleep apnea, PPGL = pheochromocytoma and paraganglioma, RASI = renin-angiotensin system inhibitor, RCT = randomized controlled trial, RDN = renal denervation, SBP = systolic blood pressure, SPC = single-pill combination.

**Keywords:** guidelines, hypertension, key insights

## 1. Introduction

In September 2024, 3 leading committees—the Chinese Society of Cardiology under the Chinese Medical Association, the Hypertension Committee of the Cross-Straits Medicine Exchange Association, and the Cardiovascular Disease Prevention and Rehabilitation Committee of the Chinese Association of Rehabilitation Medicine—jointly released the Clinical Practice Guidelines for the Management of Hypertension in China (hereinafter the Guidelines).<sup>[1]</sup> The development process was rigorous and aligned with international standards, drawing upon the World Health Organization Handbook and the Institute of Medicine. It also referred to the 2022 edition of the Guiding Principles for the Development/Revision of Clinical Practice Guidelines in China.

Moreover, the drafting process adhered to internationally recognized frameworks, including the Appraisal of Guidelines for Research & Evaluation II (AGREE II) and the Reporting Items for Practice Guidelines in Healthcare

(RIGHT). The multidisciplinary drafting team comprised clinical experts from diverse specialties, such as cardiology and hypertension, with methodological experts providing support throughout the entire process.

The Guidelines place a strong emphasis on practical clinical issues. Through a comprehensive process of issue collection and investigation, 44 key clinical topics closely associated with the prevention and management of hypertension were ultimately identified. Building upon systematic evidence retrieval and rigorous scientific evaluation, the Guidelines formulated 98 targeted recommendations. These are designed to assist Chinese clinicians in updating their understanding of hypertension, promoting the practical implementation of the Guidelines, and providing clear direction for clinical practice. Ultimately, this effort aims to enhance the awareness, treatment, and control rates of hypertension in China.

In recent years, international hypertension guidelines have been frequently updated, while domestic scholars have

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generated substantial high-quality evidence in this field. The newly released Guidelines present several advanced perspectives, many of which align closely with the “2024 ESC Guidelines for the Management of Elevated Blood Pressure and Hypertension” (hereinafter referred to as the “2024 ESC Guidelines”),<sup>[2]</sup> published in August 2024 by the European Society of Cardiology (ESC). This concordance underscores the global consistency of evidence-based conclusions. Furthermore, it reflects that Chinese scholars have achieved an internationally leading standard in the development of hypertension management Guidelines.

This article highlights and provides an in-depth analysis of the 9 core insights from the Guidelines to help physicians gain a clearer understanding of its key content. For reference, a comprehensive table summarizing all key clinical issues along with their corresponding recommendations is included in the article (Table 1).

## **2. Insight 1: introducing the concept of “prehypertension” to advance the focus of prevention and management**

In 2017, the American College of Cardiology (ACC) and the American Heart Association (AHA) jointly released the adult hypertension Guidelines, which, for the first time, lowered the diagnostic threshold for hypertension to  $\geq 130/80$  mmHg (1 mmHg = 0.133 kPa).<sup>[3]</sup> This adjustment sparked widespread global debate. In 2023, the World Health Organization published the Global Hypertension Report, highlighting that, based on extensive global observational studies, elevated systolic blood pressure (SBP) ( $\geq 115$  mmHg) is the leading risk factor for mortality. Notably, SBP within the range of 115 to 130 mmHg significantly increases the risk of death.<sup>[4]</sup> Data from China also indicate that approximately 2.67 million cardiovascular disease (CVD) deaths annually are associated with SBP  $\geq 115$  mmHg.<sup>[5]</sup>

Based on both domestic and international research evidence, while also considering social factors such as health economics, the Guidelines continue to recommend using  $\geq 140/90$  mmHg as the diagnostic threshold for hypertension. At the same time, SBP of 130 to 139 mmHg and/or diastolic blood pressure (DBP) in the range of 80–89 mmHg is classified as “prehypertension.” Studies have shown that 65% to 70% of individuals with SBP of 130 to 139 mmHg and/or DBP of 80 to 89 mmHg progress to overt hypertension within 10 to 15 years.<sup>[6,7]</sup> Furthermore, taking into account drug prices and medical insurance policies in China, initiating antihypertensive therapy in individuals with BP 130 to 139/80 to 89 mmHg has been proven to be cost-effective.<sup>[8]</sup> Therefore, the introduction of the concept of “prehypertension” aligns with China’s strategic objective of shifting the focus of CVD prevention and treatment to an earlier stage.

Similarly, the 2024 ESC Guidelines introduce the concept of “elevated blood pressure” (defined as 120–139/70–89 mmHg) and highlight the importance of cardiovascular risk assessment and blood pressure

management for individuals in this category.<sup>[2]</sup> This underscores the growing consensus among experts in the global hypertension field on the necessity of shifting blood pressure management to an earlier stage, further emphasizing the forward-thinking approach of the Guidelines in defining “prehypertension.”

## **3. Insight 2: simplifying cardiovascular risk stratification to improve the practicality of the guidelines**

The primary objective of hypertension management is to minimize the risk of cardiovascular events. Cardiovascular risk stratification runs through the entire process of hypertension management and helps in formulating individualized treatment plans. However, the cardiovascular risk-stratification methods in previous domestic and international Guidelines were overly complex, limiting their applicability in primary healthcare settings. The Guidelines significantly enhance clinical practicality by simplifying risk-stratification strategies.

The Guidelines recommend directly categorizing patients with SBP  $\geq 140$  mmHg and/or DBP  $\geq 90$  mmHg as high-risk individuals. For patients with “prehypertension,” whether they are categorized as high risk depends on a comprehensive consideration of complications in the heart, brain, and kidneys, hypertension-mediated organ damage (HMOD), or other cardiovascular risk factors. Based on epidemiological data from the Chinese population, individuals with SBP 130 to 139 mmHg and/or DBP 80 to 89 mmHg accompanied by  $\geq 3$  cardiovascular risk factors have a 10-year risk of atherosclerotic cardiovascular disease of approximately  $\geq 10\%$ .<sup>[7]</sup> As a result, such patients should be classified as high-risk individuals and promptly initiate active antihypertensive treatment. Patients with prehypertension accompanied by clinical complications or HMOD have a significantly elevated risk of cardiovascular events or mortality. In this group, active blood pressure reduction has been demonstrated to reduce the risk of cardiovascular events and mortality, justifying their classification as high-risk individuals. Patients with prehypertension who do not meet the criteria for high risk are classified as non-high-risk individuals.

## **4. Insight 3: clarifying the timing of antihypertensive treatment and emphasizing drug intervention for high-risk groups**

Based on the simplified cardiovascular risk stratification, the Guidelines recommend that high-risk patients initiate pharmacological therapy immediately, while non-high-risk patients can first attempt lifestyle modifications for 3 to 6 months. If their blood pressure remains  $\geq 130/80$  mmHg after this period, drug treatment should then be considered.

For different high-risk groups, the strength of treatment recommendations and levels of evidence vary. The Guidelines underscore that for high-risk patients with

**Table 1****Recommendations from the Clinical Practice Guidelines for the management of hypertension in China.**

Recommendations	Recommendation strength	Evidence quality
Clinical question 1: What is the reasonable diagnostic threshold for hypertension in Chinese adults?		
The recommended diagnostic threshold for hypertension in Chinese adults is systolic blood pressure (SBP) $\geq$ 140 mmHg and/or diastolic blood pressure (DBP) $\geq$ 90 mmHg.	1	B
Blood pressure levels of SBP 130 to 139 mmHg and/or DBP 80 to 89 mmHg are recommended to be classified as prehypertension.	1	B
Clinical question 2: How should cardiovascular risk stratification be simplified for patients with prehypertension and hypertension?		
Cardiovascular risk stratification for patients with prehypertension and hypertension is divided into high-risk and non-high-risk categories.	GPS	
High-risk patients: (1) SBP $\geq$ 140 mmHg and/or DBP $\geq$ 90 mmHg; (2) SBP 130 to 139 mmHg and/or DBP 80 to 89 mmHg with clinical complications, hypertension-mediated organ damage, or $\geq$ 3 cardiovascular risk factors.	GPS	
Non-high-risk patients: SBP 130 to 139 mmHg and/or DBP 80 to 89 mmHg without meeting the above high-risk criteria.	GPS	
Clinical question 3: What are the recommended methods and devices for blood pressure measurement?		
Devices: The use of validated upper-arm electronic blood pressure monitors, following standardized protocols, is recommended for measuring blood pressure in adults.	1	B
Blood pressure measurement:	1	D
(1) Rest quietly for 3 to 5 min before measuring blood pressure. Sit on a chair with a backrest, feet flat on the floor, legs uncrossed. Place the upper arm on a table, with the center of the cuff at heart level.		
(2) Use an appropriate cuff (bladder length 75%–100% of arm circumference, width 37%–50% of arm circumference; a cuff bladder width of 12 cm and length of 22–26 cm is suitable for most adults). For arm circumferences $>$ 42 cm, a wrist electronic blood pressure monitor may be used.	1	B
(3) The upper arm should be fully exposed or covered by only a single layer of clothing (do not roll up sleeves). Place the lower edge of the cuff 2 to 3 cm above the antecubital fossa.	1	C
(4) Obtain at least 2 blood pressure readings per measurement session, with a 1 to 2 min interval between readings. Use the average of the 2 readings. If the difference between the first and second readings is $>$ 10 mmHg, take a third reading and use the average of the last 2 readings. Measure blood pressure in both arms during the first session, and use the arm with the higher reading for subsequent measurements.	2	C
(5) For patients with atrial fibrillation (AF), it is recommended to use an electronic blood pressure monitor and obtain at least 3 readings per session, using the average of the 3 readings.	1	C
Clinical question 4: In the diagnosis and management of hypertension, should office blood pressure measurement (OBPM), home blood pressure monitoring (HBPM), or 24-h ambulatory blood pressure monitoring (ABPM) be used?		
Hypertension diagnosis can be based on OBPM, 24-h ABPM, or HBPM. If conditions permit, 24-h ABPM is preferred.	2	C
For hypertension management, home blood pressure monitoring (HBPM) is suggested as the first choice. If not feasible, it is suggested to manage based on office blood pressure measurement (OBPM) combined with 24-h ambulatory blood pressure monitoring.	2	C
Clinical question 5: What are the recommended timing and frequency for HBPM in patients with hypertension?		
Blood pressure should be measured once in the morning and once in the evening daily. Each measurement should include at least 2 consecutive readings with a 1 to 2 min interval between readings. The average of the two readings should be taken. If the difference between the first and second readings exceeds 10 mmHg, a third reading is recommended, and the average of the last two readings should be used. Avoid vigorous exercise, alcohol consumption, caffeinated beverages, and smoking within 30 min before measurement. Rest quietly for 3 to 5 min before each measurement.	1	D
Blood pressure should be measured in the morning before taking medication and breakfast, and after voiding.	1	B
-Blood pressure should be measured in the evening before dinner. If this is not feasible, measurement should be performed within 1 h before bedtime.	2	D
For patients with newly diagnosed or uncontrolled hypertension, it is recommended to perform HBPM for at least 3 consecutive days per week.	1	B
For patients with well-controlled blood pressure, it is suggested to perform HBPM 1 to 2 days per week.	2	D
Clinical question 6: What non-pharmacological interventions are recommended for patients with hypertension?		
Lifestyle interventions are recommended for all patients with hypertension, including dietary interventions, exercise interventions, stress reduction, weight loss, smoking cessation, alcohol limitation, and comprehensive lifestyle modifications.	2	B
Clinical question 7: Should low-sodium salt containing 25% potassium chloride be recommended as a substitute for regular salt (99% sodium chloride) for patients with hypertension in China?		
It is recommended that patients with hypertension in China use low-sodium salt as a substitute for regular salt.	1	B
It is recommended that sodium intake be limited to less than 2,000 mg per day (approximately 5 g of sodium chloride).	1	B
A potassium intake target of 3,500 to 4,700 mg/d is suggested.	2	B
Clinical question 8: What types, duration, and frequency of exercise are recommended for hypertension patients?		

(Continued)

**Table 1****Continued**

<b>Recommendations</b>	<b>Recommendation strength</b>	<b>Evidence quality</b>
For hypertension patients with SBP < 160 mmHg and DBP < 100 mmHg, moderate- or high-intensity aerobic exercise is recommended for 30 to 60 min per session, 5 to 7 days per week, along with resistance training 2 to 3 times per week.	1	B
For patients unable to meet the above recommendations due to physical limitations, physical activity should be increased as much as possible based on individual capability.	1	B
Clinical question 9: For patients with obesity and hypertension, should pharmacological or surgical weight loss interventions be more actively recommended when comprehensive lifestyle interventions fail to control weight effectively?		
Patients with hypertension aged 18 to 65 years with a body mass index (BMI) $\geq$ 28.0 kg/m <sup>2</sup> may consider pharmacological interventions with clinically proven benefits for weight control if comprehensive lifestyle interventions fail to achieve effective weight management.	2	B
Patients with hypertension aged 18 to 65 years with a BMI $\geq$ 35.0 kg/m <sup>2</sup> may consider metabolic surgery if nonsurgical interventions fail to control weight effectively.	2	B
Clinical question 10: How to determine the timing of initiating antihypertensive treatment for hypertensive patients based on cardiovascular risk stratification? Immediate initiation of antihypertensive drug therapy is recommended for patients classified as high cardiovascular risk, including the following 3 scenarios:		
(1) SBP $\geq$ 140 mmHg and/or DBP $\geq$ 90 mmHg: immediate initiation of antihypertensive drug treatment is recommended.	1	B
(2) SBP 130 to 139 mmHg and/or DBP 80 to 89 mmHg with clinical comorbidities: initiation of antihypertensive drug treatment is recommended.	1	B
(3) SBP 130 to 139 mmHg and/or DBP 80 to 89 mmHg with HMOD	GPS	
or $\geq$ 3 cardiovascular risk factors: antihypertensive drug treatment can be initiated.	2	C
For patients classified as non-high risk with SBP 130 to 139 mmHg and/or DBP 80 to 89 mmHg and with 0 to 2 cardiovascular risk factors, lifestyle interventions for 3 to 6 months are suggested. If SBP remains $\geq$ 130 mmHg and/or DBP remains $\geq$ 80 mmHg, antihypertensive drug treatment can be considered.	2	C
Clinical question 11: How should blood pressure control targets be determined for different hypertensive patients?		
Clinical question 11-1: What is the blood pressure control target for hypertensive patients without clinical comorbidities and aged < 65 years? It is suggested that hypertensive patients without clinical comorbidities and aged < 65 years have a blood pressure control target of < 130/80 mmHg.	2	B
Clinical question 11-2: What is the blood pressure control target for patients with hypertension and atrial fibrillation? For patients with hypertension and atrial fibrillation, a target blood pressure control of <130/80 mm Hg is recommended.	2	C
Clinical question 11-3: What is the blood pressure control target for patients with hypertension and coronary heart disease? For patients with hypertension and coronary heart disease, a target blood pressure control of < 130/80 mmHg is recommended.	2	B
Clinical question 11-4: What is the blood pressure control target for patients with hypertension and heart failure? For patients with hypertension and heart failure-either with reduced ejection fraction (HFrEF) or preserved ejection fraction (HFpEF)-a target blood pressure control of < 130/80 mmHg is recommended.	2	B
Clinical question 11-5: What is the blood pressure control target for patients with hypertension and diabetes? For patients with hypertension and diabetes, the following target blood pressure control is recommended:		
SBP < 130 mmHg;	2	C
DBP < 80 mmHg.	GPS	
Clinical question 11-6: What is the blood pressure control target for elderly patients with hypertension? For hypertensive patients aged 65 to 79 years, it is suggested to target blood pressure control at < 130/80 mmHg. For hypertensive patients aged $\geq$ 80 years, if well-tolerated, it can be considered to lower office SBP to 130 to 139 mmHg.	2	B
Clinical question 11-7: What is the recommended blood pressure control target for patients with hypertension who have acute hemorrhagic stroke? For hypertensive patients with acute hemorrhagic stroke, antihypertensive therapy is recommended during the acute phase, with SBP maintained at 130 to 140 mmHg.	2	C
Clinical question 11-8: At what blood pressure level should antihypertensive treatment be initiated for patients with hypertension who have acute ischemic stroke? For acute ischemic stroke patients not undergoing intravenous thrombolysis or endovascular treatment, it is suggested to initiate antihypertensive treatment when SBP is $\geq$ 220 mmHg and/or DBP is $\geq$ 120 mmHg. For acute ischemic stroke patients planning to undergo intravenous thrombolysis or endovascular treatment, it is suggested to control blood pressure to $\leq$ 185/110 mmHg before treatment. For acute ischemic stroke patients who have undergone endovascular treatment and achieved vascular recanalization, early intensive blood pressure lowering should be avoided.	1	B
Clinical question 11-9: What is the recommended blood pressure control target for patients with hypertension and a history of stable stroke (including hemorrhagic and ischemic stroke)? It is recommended that patients with hypertension and a history of stable stroke target a blood pressure of < 130/80 mmHg to prevent stroke recurrence.	1	A
Clinical question 11-10: What is the blood pressure control target for nondialysis CKD patients? For nondialysis CKD patients with proteinuria > 300 mg/d, it is suggested to target blood pressure control at < 130/80 mmHg, and if tolerated, SBP can be further reduced to 120 mmHg.	2	B

*(Continued)*

**Table 1****Continued**

<b>Recommendations</b>	<b>Recommendation strength</b>	<b>Evidence quality</b>
For nondialysis CKD patients with proteinuria $\leq 300$ mg/d, it is suggested to target blood pressure control at $< 140/90$ mmHg, and if tolerated, SBP can be further reduced to 130 mmHg.	2	B
Clinical question 12: Should patients with hypertension achieve target blood pressure within 4 weeks? It is suggested that patients with hypertension without clinical comorbidities and aged $< 65$ years achieve target blood pressure within 4 weeks.	2	D
Clinical question 13: What is the recommendation for initial antihypertensive drugs in hypertensive patients without clinical comorbidities? It is recommended to use angiotensin-converting enzyme inhibitors (ACEIs), angiotensin receptor blockers (ARBs), calcium channel blockers (CCBs), or diuretics as the first-line antihypertensive drugs in patients with hypertension who have no clinical comorbidities.	1	B
Clinical question 14: When should hypertensive patients use combination antihypertensive therapy? Should free combination or single-pill combination (SPC) be chosen? For hypertensive patients with blood pressure $\geq 140/90$ mmHg, it is recommended to initiate combination antihypertensive drug therapy.	1	B
For hypertensive patients requiring combination antihypertensive drug therapy, it is suggested to prioritize the use of SPCs.	2	C
For SPCs, it is suggested to prioritize the use of renin-angiotensin system inhibitors (RASIs) combined with CCBs or diuretics.	2	C
Clinical question 15: What are the recommendation antihypertensive drugs for patients with hypertension and coronary heart disease? For patients with hypertension and coronary heart disease and symptoms of exertional angina, it is recommended to prioritize $\beta$ -blockers and CCBs as the first-line antihypertensive drugs.	1	C
For hypertensive patients with coronary heart disease and a history of myocardial infarction, it is recommended to prioritize $\beta$ -blockers and ACEIs or ARBs as the first-line antihypertensive drugs.	1	C
Clinical question 16: What is the recommendation for first-line antihypertensive drugs in hypertensive patients with heart failure? For hypertensive patients with HFrEF, angiotensin receptor neprilysin inhibitor (ARNI) is suggested as the first-line medication to replace ACEIs/ARBs.	2	B
For hypertensive patients with HFpEF, either ARNI, ARB, or ACEI can be used as a first-line medication.	2	C
Clinical question 17: What is the recommendation for antihypertensive drugs in hypertensive patients with stroke? For hypertensive patients with a history of stroke or transient ischemic attack (TIA), it is recommended to use ACEIs, diuretics, or a combination of ACEIs and diuretics for antihypertensive treatment.	1	A
If the above medications are not suitable or effective, CCBs or ARBs can be considered as alternatives.	2	C
For patients with hypertension and a history of stroke or TIA, $\beta$ -blockers are not recommended as first-line antihypertensive drugs.	1	A
Clinical question 18: What medications are recommended to improve outcomes for patients with hypertension and type 2 diabetes? For patients with hypertension and type 2 diabetes, it is recommended to prioritize ACEIs or ARBs for blood pressure control.	1	B
For patients with hypertension and type 2 diabetes, it is suggested to preferentially use sodium-glucose cotransporter-2 inhibitors (SGLT2i) or glucagon-like peptide-1 receptor agonists (GLP-1RA) for treatment.	2	B
Clinical question 19: Should RASIs be recommended as the first-line antihypertensive treatment for CKD patients? RASIs are recommended as the first-line antihypertensive treatment for CKD patients with microalbuminuria or proteinuria.	1	B
RASIs can be used as the first-line antihypertensive medication for CKD patients without microalbuminuria or proteinuria.	2	B
Clinical question 20: Which patients with hypertension are recommended to receive aspirin therapy? For patients with hypertension and comorbid coronary heart disease, ischemic stroke, or peripheral vascular disease, long term secondary prevention with aspirin at a dose of 75 to 100 mg per day is recommended.	1	A
For hypertensive patients aged 40 to 65 years with high cardiovascular risk and low bleeding risk, low-dose aspirin (75–100 mg/d) can be considered for primary prevention.	2	B
For high bleeding risk populations (such as those with a history of gastrointestinal bleeding, intracerebral hemorrhage within 3 months, or bleeding in other locations; those taking other medications that increase bleeding risk; or those with uncontrolled hypertension), aspirin is not suggested for primary prevention.	2	C
Clinical question 21: How often should follow-up visits be scheduled for hypertension patients after initiating antihypertensive treatment? For hypertension patients starting or adjusting antihypertensive medications, follow-up visits are suggested every 2 to 4 weeks (depending on the condition) until blood pressure is controlled.	GPS	
For patients whose blood pressure is controlled after antihypertensive treatment, follow-up visits can be considered every 3 months.	GPS	
Clinical question 22: How should community hypertension patients be managed? A comprehensive management model involving community doctors and village doctors is recommended.	1	A
Clinical question 23: Should spironolactone be considered as the fourth medication for resistant hypertension patients? For resistant hypertension patients with $eGFR \geq 45$ mL·min <sup>-1</sup> ·1.73m <sup>-2</sup> and serum potassium $< 4.5$ mmol/L, spironolactone (20–40 mg/d) is recommended as the fourth medication.	1	B
Clinical question 24: Which hypertension patients are suitable for renal denervation? For patients with resistant hypertension, intolerance to antihypertensive medications, or clinical features consistent with sympathetic overactivity, renal denervation may be considered as a blood pressure-lowering strategy.	2	B

*(Continued)*

**Table 1****Continued**

<b>Recommendations</b>	<b>Recommendation strength</b>	<b>Evidence quality</b>
Clinical question 25: What are the emergency management principles for hypertensive emergencies? For hypertensive patients with significantly elevated blood pressure (SBP > 180 mmHg and/or DBP > 120 mmHg), it is recommended to promptly assess whether there is newly developed or progressively worsening HMOD (hypertension-mediated target organ damage).	GPS	
For hypertensive patients with newly developed or progressively worsening HMOD, it is recommended to admit them to the emergency rescue room or intensive care unit for treatment, continuously monitor blood pressure and HMOD, and administer intravenous antihypertensive medications.	GPS	
Acute-phase blood pressure management principles for hypertensive emergencies: it is recommended to lower blood pressure-gradually to a relatively safe range while ensuring adequate organ perfusion (reduce SBP by no more than 25% of the pretreatment level within the first hour of treatment; if the condition is stable, reduce blood pressure to approximately 160/100 mmHg over the next 2 to 6 h; subsequently, gradually lower blood pressure to the target level within 24 to 48 h). The extent and rate of blood pressure reduction should be individualized based on the patient's specific condition.	GPS	
For hypertensive emergency patients with severe complications (e.g., severe preeclampsia or eclampsia, pheochromocytoma crisis), it is suggested to lower SBP to below 140 mmHg within 1 h of treatment.	GPS	
For hypertensive emergency patients with aortic dissection, if tolerated, it is recommended to lower SBP to 110 to 120 mmHg within 1 h while controlling the heart rate to < 60 beats/min.	GPS	
Clinical question 26: Which hypertensive patients should be screened for secondary hypertension? It is recommended to screen for common causes of secondary hypertension in the following patients: (1) newly diagnosed hypertensive patients; (2) hypertensive patients with an onset age < 40 years; (3) patients with resistant hypertension; (4) hypertensive patients with clinical clues of secondary hypertension or extensive HMOD.	2	C
Clinical question 27: Which hypertensive patients should be screened for primary aldosteronism? It is recommended that all hypertensive patients undergo at least one screening for primary aldosteronism, especially those with newly diagnosed hypertension, resistant hypertension, or hypertension associated with hypokalemia.	2	C
Clinical question 28: What are the recommended initial screening indicators and cutoff values for primary aldosteronism? It is recommended to measure plasma aldosterone and renin levels after 2 h in a nonsupine position and use the aldosterone-to-renin ratio (ARR) as the screening indicator for primary aldosteronism.	1	B
It is recommended that the ARR cutoff value based on renin concentration be 2.0 (ng/dL)/(mU/L), and the ARR cutoff value based on renin activity be 30 (ng/dL)/(ng/mL/h).	2	C
Clinical question 29: For patients suspected of primary aldosteronism with positive initial ARR screening, which confirmatory tests are recommended? The captopril suppression test or saline infusion test is suggested as confirmatory tests for primary aldosteronism.	2	C
Clinical question 30: Is discontinuation of drugs that affect renin and aldosterone status necessary throughout the screening process for primary aldosteronism? For hypertensive patients, it is preferable to screen for primary aldosteronism after discontinuing medications that significantly affect the ARR (or switching to medications with minimal impact on ARR). For ARR results obtained without medication withdrawal (or switching), the results should be interpreted appropriately.	2	D
Clinical question 31: Which hypertensive patients should be screened for Cushing syndrome? It is recommended to screen for Cushing syndrome in adult hypertensive patients with the following conditions: (1) typical clinical features (e.g., skin bruising, plethoric appearance, proximal muscle atrophy, and purple striae); (2) other clinical features (e.g., menstrual irregularities, acne, weight gain, and central obesity); (3) resistant hypertension; (4) osteoporosis inconsistent with age; (5) adrenal incidentalomas; (6) special populations with type 2 diabetes (requiring insulin or using 2 or more antihypertensive medications).	2	C
Clinical question 32: How should hypertensive patients be screened for Cushing syndrome? It is suggested to use any of the following methods to screen hypertensive patients suspected of having Cushing syndrome: (1) Overnight 1 mg dexamethasone suppression test;	2	D
(2) 24-h urinary free cortisol;	2	C
(3) Midnight salivary cortisol.	2	C
Clinical question 33: Which hypertensive patients should be screened for pheochromocytoma and paraganglioma (PPGL)? It is recommended to screen the following groups for PPGL:		
(1) Patients with paroxysmal hypertension accompanied by the triad of headache, palpitations, and sweating;	1	C
(2) Patients whose PPGL symptoms are triggered by medications affecting adrenergic receptors, changes in abdominal pressure, anesthesia, or surgery;	1	C
(3) Patients with adrenal incidentalomas;	1	C
(4) Patients with a family history of PPGL or related genetic syndromes;	1	C
(5) Patients with unexplained myocardial damage or stress cardiomyopathy.	2	D
Clinical question 34: How should PPGL be screened and diagnosed? It is recommended to measure plasma-free or 24-h urinary metanephrine (MN) and normetanephrine (NMN) concentrations as the preferred diagnostic indicators for PPGL.	1	B
Clinical question 35: What is the optimal approach for diagnosing tumor localization in patients with PPGL? Computed tomography (CT) is the preferred imaging method for tumor localization in PPGL patients.	1	B
Magnetic resonance imaging (MRI) is used to investigate skull base and neck paragangliomas and metastatic tumors.	1	C

*(Continued)*

**Table 1****Continued**

Recommendations	Recommendation strength	Evidence quality
Metaiodobenzylguanidine (MIBG),	1	C
<sup>68</sup> Ga-dotatate positron emission tomography/computed tomography (PET/CT),	2	B
And somatostatin receptor octreotide imaging can also be used for functional imaging localization of PPGL.	2	C
Clinical question 36: Which PPGL patients are candidates for genetic testing?		
It is recommended that all PPGL patients, especially those with multiple lesions, metastatic lesions, bilateral adrenal lesions, familial PPGL, or manifestations of genetic syndromes, undergo genetic testing.	2	C
Clinical question 37: Which hypertensive patients should be screened for renal artery stenosis (RAS)?		
Screening for RAS should be considered in hypertensive patients meeting any of the following conditions:		
(1) History of ASCVD;	2	C
(2) Early-onset hypertension (age < 40 years);	2	D
(3) Persistent blood pressure $\geq$ 160/100 mmHg or sudden difficulty in blood pressure control without changes in antihypertensive medications or other causes;	GPS	
(4) Normal left ventricular ejection fraction (LVEF) but recurrent transient pulmonary edema;	2	D
(5) Resistant hypertension;	2	C
(6) Physical examination reveals periumbilical vascular bruits;	GPS	
(7) Significant increase in serum creatinine or marked blood pressure reduction after using antihypertensive medications (especially ACEI/ARB);	2	D
(8) Unilateral renal atrophy;	GPS	
(9) Hypokalemia.	GPS	
Clinical question 38: What diagnostic methods are recommended for RAS?		
When eGFR $\geq$ 30 mL·min <sup>-1</sup> ·1.73m <sup>-2</sup> , it is recommended to prioritize renal artery computed tomography angiography (CTA), with gadolinium-enhanced magnetic resonance angiography and renal artery ultrasound as alternatives.	1	B
When eGFR < 30 mL·min <sup>-1</sup> ·1.73m <sup>-2</sup> , it is recommended to prioritize renal artery ultrasound, with nonenhanced magnetic resonance angiography as an alternative and to avoid using CTA or enhanced magnetic resonance angiography whenever possible.	GPS	
Digital subtraction angiography (DSA) is the gold standard for diagnosing RAS, but is mainly used when the above tests cannot confirm the diagnosis or when renal artery intervention is planned.	1	C
For patients with normal renal function (eGFR $\geq$ 60 mL·min <sup>-1</sup> ·1.73m <sup>-2</sup> ), captopril renal dynamic imaging may be considered.	2	C
Clinical question 39: Is RASI recommended for blood pressure control in hypertensive patients with RAS?		
For hypertensive patients with unilateral RAS, it is recommended to use RASI under close monitoring of urine output, electrolytes, and serum creatinine.	1	C
After successful intervention for RAS, the use of RASI may be considered.	2	C
For patients with bilateral RAS, solitary kidney, or single functional kidney with RAS, RASI may be cautiously used under close monitoring of renal function, starting with a low dose, if there are other indications for RASI.	2	D
If oliguria or an increase in serum creatinine > 0.5 mg/dL (44 $\mu$ mol/L) or > 30% above baseline occurs during RASI treatment, dose reduction or discontinuation is suggested.	GPS	
Clinical question 40: For atherosclerotic RAS patients, is interventional treatment or medication treatment recommended?		
Medication treatment is the first choice for atherosclerotic RAS.	1	B
For atherosclerotic RAS patients with resistant hypertension, renal function decline, transient pulmonary edema, or refractory heart failure, renal artery interventional treatment may be considered.	2	D
For atherosclerotic RAS $\geq$ 70% and evidence that the stenosis is related to hypertension or renal function decline, renal artery interventional treatment may be considered.	GPS	
Clinical question 41: For hypertensive patients with obstructive sleep apnea (OSA), is continuous positive airway pressure (CPAP) and mineralocorticoid receptor antagonist (MRA) treatment recommended?		
For hypertensive patients with moderate-to-severe OSA, it is suggested to use CPAP during sleep.	2	C
For patients with moderate-to-severe OSA and resistant hypertension, the use of MRA is suggested.	2	C
Clinical question 42: Which hypertensive patients are recommended for genetic testing to exclude monogenic hereditary hypertension?		
It is recommended that hypertensive patients with an onset age $\leq$ 35 years, combined with abnormal blood potassium, low plasma renin, and exclusion of common secondary hypertension, undergo genetic testing to screen for monogenic hereditary hypertension.	2	D
Clinical question 43: For hypertensive patients with anxiety or depression, which assessment tools are recommended for rapid and accurate screening?		
For hypertensive patients with depression, it is recommended to use the 9-item Patient Health Questionnaire (PHQ-9) for depression screening.	2	B
For hypertensive patients with anxiety, it is recommended to use the 7-item Generalized Anxiety Disorder Scale (GAD-7) for anxiety screening.	2	B
Clinical question 44: In hypertensive patients with comorbid anxiety or depression, is the concomitant use of antihypertensive and antianxiety or antidepressant medications recommended?		
In hypertensive patients with comorbid anxiety or depression, the combined use of antihypertensive and antianxiety or antidepressant medications may be considered.	2	C

ASCVD = atherosclerotic cardiovascular disease, CKD = chronic kidney disease, CT = computed tomography, eGFR = estimated glomerular filtration rate, GPS = good practice statement, HMOD = hypertension-mediated organ damage

clinical complications or HMOD, initiating antihypertensive treatment as early as possible can effectively delay the progression of HMOD, reduce cardiovascular events, and lower mortality risk.

For patients with “prehypertension” and 3 or more cardiovascular risk factors, there is currently insufficient high-quality evidence specific to the Chinese population to definitively determine whether pharmacological therapy should be initiated. Treatment decisions should therefore be individualized. For “prehypertension” patients with 0 to 2 cardiovascular risk factors, there is no clear evidence supporting the long-term benefits of drug treatment, highlighting the need for future randomized controlled trials (RCTs) to validate this approach. Similarly, for patients with DBP of 80 to 89 mmHg, there is no direct evidence to guide the timing of antihypertensive drug initiation. However, findings from the BPLTTC study indicate that a 3 mmHg reduction in DBP is associated with a similar reduction in the risk of major adverse cardiac events across hypertensive patients of all age groups.<sup>[9]</sup>

The recommendations outlined in the 2024 ESC Guidelines align closely with our Guidelines. According to the ESC Guidelines, in adults with elevated blood pressure and sufficiently high cardiovascular risk, drug pharmacological therapy may be considered if blood pressure remains  $\geq 130/80$  mmHg after 3 months of lifestyle intervention. For patients with confirmed blood pressure  $\geq 140/90$  mmHg, drug treatment should be initiated immediately, regardless of their cardiovascular risk level.<sup>[2]</sup>

### **5. Insight 4: strengthening evidence for the benefits of blood pressure reduction and establishing blood pressure control targets for specific populations**

Extensive domestic and international studies have demonstrated that intensive blood pressure reduction can significantly lower cardiovascular risks. Chinese researchers have also contributed high-quality RCTs in this field. Notably, the China Rural Hypertension Control Project, led by Professor Yingxian Sun, showed that an intensive blood pressure reduction strategy targeting 130/80 mmHg, implemented through a comprehensive village doctor-led management model, not only achieved effective intensive blood pressure control but also significantly reduced cardiovascular events and mortality during a 36-month follow-up.<sup>[10]</sup>

Additionally, the Strategy of Blood Pressure Intervention in the Elderly Hypertensive Patients (STEP) study conducted by our team confirmed that, in elderly hypertensive patients aged 60 to 80 years, maintaining SBP within the range of 110 to 130 mmHg significantly reduced the incidence of composite endpoints—including hemorrhagic and ischemic stroke, acute coronary syndrome, and heart failure—while demonstrating favorable safety profiles.<sup>[11]</sup>

Based on evidence from these and other studies, the Guidelines recommend different blood pressure control targets for specific populations. For most hypertensive patients—such as those without clinical comorbidities or those with conditions like atrial fibrillation, coronary artery disease, heart failure, stable stroke, or nondialysis chronic kidney disease (CKD), as well as elderly individuals aged 65 to 79 years—blood pressure should ideally be controlled below 130/80 mmHg, provided this is well-tolerated. Exceptions include patients with acute ischemic stroke, where early intensive blood pressure reduction should be avoided to maintain adequate cerebral blood flow, and elderly patients aged  $\geq 80$  years, for whom evidence remains insufficient. These recommendations align closely with the blood pressure control targets outlined in the 2024 ESC Guidelines.<sup>[2]</sup>

### **6. Insight 5: evidence-based recommendations for antihypertensive drugs, with beta-blockers excluded from first-line treatment**

The Guidelines explicitly recommend that for hypertensive patients without clinical comorbidities, angiotensin-converting enzyme inhibitors (ACEIs), angiotensin receptor blockers (ARBs), calcium channel blockers (CCBs), and diuretics should serve as first-line antihypertensive medications. Findings from multiple meta-analyses indicate that beta-blockers are less effective than other antihypertensive drug classes in improving clinical outcomes for hypertensive patients and are associated with relatively lower safety profiles.<sup>[12,13]</sup> As a result, the Guidelines exclude beta-blockers from the list of first-line initial therapies. This recommendation is consistent with the 2024 ESC Guidelines, which also omit beta-blockers from their first-line options.<sup>[2]</sup>

However, beta-blockers remain a valuable therapeutic option for specific scenarios. In hypertensive patients presenting with tachycardia or sympathetic nervous system hyperactivity, beta-blockers may be effective. Furthermore, for patients with comorbidities like coronary artery disease or heart failure, beta-blockers are considered cornerstone medications for secondary prevention and are appropriate for inclusion in combination therapy.

To enhance blood pressure control rates and provide better protection for target organs, the Guidelines advocate for combination antihypertensive therapy in patients with blood pressure levels  $\geq 140/90$  mmHg. Research highlights that medication adherence plays a critical role in achieving effective blood pressure reduction. Compared with free combination regimens, single-pill combinations (SPCs) are more likely to be accepted by patients, thereby improving adherence and treatment efficacy. Therefore, the Guidelines emphasize the importance of prioritizing SPCs. Clinical evidence supports the use of SPC combinations, particularly those involving renin-angiotensin system inhibitors (RASIs) + CCBs or RASIs + diuretics, as first-line options.

## 7. Insight 6: tailoring antihypertensive drug regimens to address different clinical comorbidities

The primary goal of hypertension treatment is not only to achieve blood pressure control but also to maximize the protective effects of antihypertensive drugs on target organs such as the heart, brain, and kidneys. This approach enables patients to benefit from the drugs' multiple mechanisms of action, achieving a "one drug, multiple effects" therapeutic outcome.

In hypertensive patients with coronary artery disease, individualized regimens are recommended based on clinical presentations. If angina symptoms are present, a combination of beta-blockers and CCBs is preferred. Beta-blockers reduce heart rate and myocardial oxygen demand, alleviating angina symptoms, while CCBs improve atherosclerosis, dilate blood vessels, and reduce cardiac workload, collectively lowering the risk of all-cause mortality and cardiovascular events in patients with stable coronary artery disease.<sup>[14]</sup> In patients with a history of myocardial infarction, a combination of beta-blockers and ACEIs or ARBs is recommended, which improves myocardial remodeling and reduces cardiovascular and all-cause mortality.<sup>[15]</sup>

In hypertensive patients with heart failure with reduced ejection fraction (HFrEF), angiotensin receptor neprilysin inhibitors (ARNIs) are recommended as a preferred alternative to ACEIs/ARBs. Studies have shown that ARNIs are more effective in controlling SBP and heart rate and provide greater benefits in improving renal function.<sup>[16]</sup> For those with heart failure with preserved ejection fraction (HFpEF), evidence suggests no significant differences in efficacy among ARNIs, ARBs, or ACEIs. Therefore, any of these 3 drug classes can be used as first-line options.

In hypertensive patients with diabetes, ACEIs or ARBs are recommended as first-line antihypertensive agents. Additionally, it recommends SGLT2i or GLP-1RA as antidiabetic medications due to their cardiovascular and renal protective effects. SGLT2i not only enhance cardiac function, reduce proteinuria, and delay the progression of CKD but are also the only drugs shown to improve cardiovascular outcomes in patients with heart failure with preserved ejection fraction.<sup>[16]</sup> On the other hand, GLP-1RA provide greater benefits for patients with atherosclerotic cardiovascular disease, particularly those who are obese.<sup>[17]</sup> Both drug classes also contribute to auxiliary blood pressure reduction.

In hypertensive patients with nondialysis CKD, RASIs are recommended to reduce proteinuria and slow CKD progression. However, since RASIs may increase serum creatinine and potassium levels, close monitoring of relevant biomarkers is essential. If serum potassium exceeds 5.5 mmol/L, serum creatinine rises by > 30%, or estimated glomerular filtration rate decreases by > 25%, after excluding factors such as volume depletion or concomitant medication, dose reduction or discontinuation of RASIs should be considered.

## 8. Insight 7: highlighting the central role of nonpharmacological treatment in hypertension management

The Guidelines emphasize that nonpharmacological interventions serves as the cornerstone of hypertension management. It is applicable to all hypertensive patients and must be sustained throughout the entire management process. Key lifestyle interventions include dietary changes, physical activity, stress management, weight control, and the limitation of smoking and alcohol consumption. Among these, the combination of a healthy diet and regular exercise is identified as the most effective non-pharmacological approach to reducing blood pressure.<sup>[18]</sup>

Excessive sodium intake and inadequate potassium consumption are major risk factors for hypertension, especially in Asian populations, where salt-sensitive hypertension is highly prevalent. In China, excessive dietary sodium is a widespread issue. Consequently, lowering sodium intake and increasing potassium consumption represent effective strategies for blood pressure reduction. A recent RCT conducted in China demonstrated that replacing regular salt with potassium-enriched salt (containing 25% potassium chloride) significantly reduced blood pressure and the incidence of cardiovascular events.<sup>[19]</sup>

As a result, the Guidelines advise hypertensive patients to prioritize the use of low-sodium salt as a healthier substitute for traditional salt. However, the successful and widespread implementation of this recommendation requires increased societal awareness and robust policy support.

## 9. Insight 8: correctly understanding the indications for renal denervation

While drug therapy remains the cornerstone of hypertension management, renal denervation (RDN), an innovative interventional treatment, has received increasing attention in recent years. Based on existing research evidence, RDN has been approved for antihypertensive treatment both domestically and internationally, with multiple radiofrequency ablation RDN devices launched in China in 2024.

The Guidelines stress the importance of carefully selecting appropriate patient groups for RDN, urging against its blind promotion. It suggests that RDN may be considered as an adjunctive strategy for lowering blood pressure in specific cases, such as patients with resistant hypertension, those unable to tolerate antihypertensive medications, or those with clinical signs of sympathetic overactivity. However, RDN is not yet positioned as a first-line or mainstream treatment option.

The 2024 ESC Guidelines echo these recommendations. They propose confining the application of RDN to experienced hypertension interventional centers. Furthermore, they limit the indications for RDN to (1) patients with resistant hypertension whose blood pressure remains inadequately controlled despite the use of

3 antihypertensive medications (including a diuretic) or (2) patients whose blood pressure is poorly controlled on fewer than 3 medications due to nonadherence or intolerance (especially when first-line antihypertensive drugs are contraindicated), provided these patients also exhibit high CVD risk and are willing to undergo the procedure. Additionally, the ESC Guidelines emphasize the necessity of detailed patient communication and shared decision-making.<sup>[2]</sup>

Both Guidelines highlight the importance of ruling out secondary hypertension prior to considering RDN, due to the relatively high prevalence of secondary causes among patients with resistant hypertension. For certain special populations, such as those with moderate-to-severe renal impairment, there is insufficient evidence to confirm whether RDN offers tangible benefits. Internationally, Guidelines generally discourage the use of RDN in patients with an estimated glomerular filtration rate < 40 mL·min<sup>-1</sup>·1.73m<sup>-2</sup>.<sup>[2,20,21]</sup>

Additional unresolved issues necessitating further research include whether RDN can reduce cardiovascular events and its cost-effectiveness. Thus, a cautious and evidence-based approach is crucial to maximize patient benefit while minimizing potential risks.

### 10. Insight 9: highlighting the importance of screening for secondary hypertension and defining target populations and procedures

In recent years, with the increasing recognition of secondary hypertension, experts both in China and internationally have advocated for more enhanced screening efforts. The Guidelines identify 4 key categories of patients who should be screened for secondary hypertension: (1) newly diagnosed hypertensive patients; (2) hypertensive patients with an onset age of less than 40 years; (3) patients with resistant hypertension, and (4) hypertensive patients presenting with clinical clues of secondary hypertension or extensive HMOD.

Common causes of secondary hypertension include obstructive sleep apnea syndrome, renal parenchymal disease, renovascular disease, endocrine-related hypertension (e.g., primary aldosteronism, pheochromocytoma/paraganglioma, Cushing syndrome, and thyroid disorders), coarctation of the aorta, and monogenic hereditary hypertension. Despite its clinical significance, the screening rate for secondary hypertension in China remains relatively low. To address this gap, the Guidelines dedicate an entire section to secondary hypertension, emphasizing its importance as a key framework for clinical discussion.

Taking primary aldosteronism as an example, it is estimated to account for 5% to 10% of all hypertensive cases,<sup>[22]</sup> making it one of the most prevalent causes of secondary hypertension, with the true prevalence likely even higher. As such, the Guidelines recommend that all hypertensive patients undergo at least one screening for primary aldosteronism, with particular emphasis on newly diagnosed hypertension, resistant hypertension,

or hypertension accompanied by hypokalemia. This recommendation aligns with the principles outlined in the 2024 ESC Guidelines. For each common cause of secondary hypertension, the Guidelines provide detailed, evidence-based screening procedures and treatment recommendations.

The recently released *Clinical Practice Guidelines for the Management of Hypertension in China* represent the collective expertise of numerous professionals and researchers in the field of hypertension. These Guidelines offer scientifically grounded and practical recommendations for addressing critical issues in clinical practice. While many evidence gaps remain in the field of hypertension, the publication of the Guidelines marks a significant step forward in standardizing hypertension management in China. Through accurate interpretation and effective implementation, the Guidelines are poised to drive progress in the prevention and treatment of hypertension, ultimately contributing to a substantial reduction in the national burden of CVDs.

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