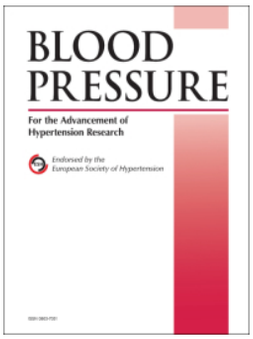

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A consensus statement from the Portuguese Society of Hypertension and the Portuguese Society of Cardiology for bridging the 2023–2025 hypertension Guidelines in clinical practice

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NEWS

A consensus statement from the Portuguese Society of Hypertension and the Portuguese Society of Cardiology for bridging the 2023–2025 hypertension Guidelines in clinical practice

Heloísa Ribeiro[a], Eduardo Matos Vilela[b,c], Fernando Martos Gonçalves[d], Cristina Gavina[c,e,f] and Rosa de Pinho[g]

[a]Serviço de Medicina Interna, Unidade Local de Saúde de Entre Douro e Vouga. R. Dr. Cândido Pinho 5, Santa Maria da Feira, Portugal; [b]Serviço de Cardiologia, Unidade Local de Saúde de Gaia e Espinho. Rua Conceição Fernandes, Vila Nova de Gaia, Portugal; [c]Departamento de Medicina, Faculdade de Medicina da Universidade do Porto. Alameda Prof. Hernâni Monteiro, Porto, Portugal; [d]Serviço de Medicina Interna, Hospital Beatriz Ângelo, Unidade Local de Saúde Loures, Odivelas, Avenida Carlos Teixeira, 3. Loures, Portugal; [e]Serviço de Cardiologia, Unidade Local de Saúde de Matosinhos, Senhora da Hora, Portugal; [f]UnIC, Faculdade de Medicina, Universidade do Porto. Al. Prof. Hernâni Monteiro, Porto, Portugal; [g]USF Vale do Vouga, Unidade Local de Saúde Entre Douro e Vouga, São João da Madeira, Portugal

ABSTRACT

Background: Effective management of arterial hypertension remains a major global health priority. In the need to improve real-world implementation of best practices, three international organisations have released independent clinical practice guidelines: the European Society of Hypertension (ESH, 2023), the European Society of Cardiology (ESC, 2024) and the American College of Cardiology/American Heart Association (AHA/ACC, 2025).[1]

Aim and methods: This society-endorsed consensus document, jointly developed by the Portuguese Society of Hypertension and the Portuguese Society of Cardiology, aims to harmonise partially divergent hypertension guidelines into applicable recommendations. It provides a pragmatic comparative synthesis of the 2023–2025 guidelines, structured according to the M.A.P.E. framework (Measure, Assess, Prescribe, Evaluate), to support decision-making in clinical practice.

Results: Across European guidelines, there is a strong alignment in the definition of hypertension (systolic BP ≥140 mmHg and/or diastolic BP ≥90 mmHg), CV risk stratification, lifestyle interventions, and first-line use of combination therapy of two drugs out of four. Divergences arise in BP classification systems, initiation thresholds, dosing strategies and target BP goals. The 2025 AHA/ACC Guidelines differ by adopting lower diagnostic and treatment thresholds (≥130/80 mmHg) and early pharmacological intervention based on individual CV risk. This consensus acknowledges differences and supports a risk-based approach grounded in randomised trial evidence, feasibility in routine clinical practice, and patient safety, recognising office BP as the basis for treatment decisions.

Conclusions: This consensus aims to reduce clinical uncertainty and optimise hypertension management in real-world practice providing clear and evidence-informed clinical recommendations.

PLAIN LANGUAGE SUMMARY

High blood pressure, also called hypertension, is one of the most common health problems worldwide. It greatly increases the risk of heart and kidney disease. To help doctors and patients manage hypertension effectively, several international organisations regularly update their treatment recommendations, known as clinical guidelines.

This article summarises and compares the most recent guidelines from three major scientific organisations: the European Society of Hypertension (ESH, 2023), the European Society of Cardiology (ESC, 2024), and the American College of Cardiology/American Heart Association (AHA/ACC, 2025). Although these guidelines share the same goal – improving blood pressure control and preventing heart, brain and kidney complications – they differ in certain clinical details, such as when to start medication, how much to lower blood pressure, and the targets to achieve.

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CONTACT Rosa de Pinho depinhorosa@gmail.com USF Vale do Vouga, Unidade Local de Saúde Entre Douro e Vouga, São João da Madeira, Portugal

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This consensus document, developed by the Portuguese Society of Hypertension and the Portuguese Society of Cardiology, combines different guidelines on high blood pressure to offer clear and practical advice for everyday patient care.
The European guidelines agree on defining hypertension as blood pressure at or above 140/90 mmHg. They also recommend lifestyle changes, regular monitoring, and the use of the same main types of blood pressure-lowering medicines. In contrast, the American guidelines use lower thresholds (from 130/80 mmHg) and encourage earlier medicine treatment in people at higher cardiovascular risk.
The Portuguese consensus acknowledges these differences and supports a risk-based approach that is based on results from clinical trials, is practical for everyday care, and prioritises patient safety, using blood pressure measured in the clinic to guide treatment decisions.
By bringing together European and American guidelines, this Portuguese consensus aims to reduce uncertainty for healthcare professionals and help improve the everyday management of high blood pressure through well-defined and practical recommendations.

Introduction

Hypertension is the most common cardiovascular (CV) disorder globally, affecting an estimated 1.28 billion adults aged 30 to 79 years, with approximately two-thirds of cases occurring in low- and middle-income countries [1]. In 2019, the global age-standardised prevalence of hypertension in this age group was 34% among men and 32% among women [1]. Prevalence rates across Europe reflect these global estimates, although considerable between-country variation exists, with Western European countries generally reporting below-average rates and Eastern European countries tending towards higher prevalence [1]. Despite therapeutic advances and the availability of low-cost treatments, a substantial proportion of individuals with hypertension – estimated at over 580 million globally – remain undiagnosed, particularly in low- and middle-income countries [1]. A major factor contributing to the suboptimal diagnosis, treatment, and control of hypertension is the limited implementation of evidence-based guidelines in real-world clinical practice [2].

According to a 2017 meta-analysis, each 10-mmHg reduction in systolic blood pressure (SBP) is associated with a significantly lower risk of CV events – including coronary heart disease, stroke, and heart failure – and a 13% reduction in all-cause mortality [3]. Ensuring effective blood pressure (BP) control is therefore critical to improving patient outcomes and mitigating the considerable healthcare and societal costs associated with hypertension and its complications [4].

In response to evolving evidence and emerging challenges in hypertension management, the European Society of Hypertension (ESH), the European Society of Cardiology (ESC) and the American College of Cardiology/American Heart Association (ACC/AHA) Joint Committee have recently published updated, independent clinical practice guidelines [2,5,6]. Although these documents share a common objective – improving BP control and reducing CV risk – they diverge in several key domains, including diagnostic thresholds, treatment initiation criteria, pharmacological strategies, and BP targets. The coexistence of multiple authoritative guidelines, partially discordant in their recommendations, poses a practical challenge for clinicians and may contribute to uncertainty, heterogeneity of care, and therapeutic inertia. This is particularly relevant in real-world clinical settings, where limited consultation time and increasing patient complexity require clear, operational guidance.

Against this background, the Portuguese Society of Hypertension and the Portuguese Society of Cardiology jointly developed this national consensus statement, acknowledging that other prior publications have described areas of convergence and divergence across contemporary hypertension guidelines [7,8]. Beyond summarising these differences, however, the present document represents a formal, society-endorsed national consensus that translates guideline discordance into explicit, operational clinical recommendations. By defining a shared position on key areas of uncertainty and providing practical algorithms and consensus tables, this statement aims to support consistent and evidence-informed decision-making within the Portuguese healthcare system.

Structured according to the M.A.P.E. framework (Measure, Assess, Prescribe, Evaluate), this consensus seeks to support family physicians, internists, and specialists in translating international recommendations into coherent, patient-centred, and implementable strategies for hypertension management.

Measure blood pressure: diagnose

Accurate BP measurement represents the initial and critical step in the diagnosis and management of hypertension [9]. For clinical decision-making and appropriate risk stratification, BP is categorised according to systolic and diastolic values (Figure 1). The 2023 ESH Guidelines classify office BP into eight distinct categories, including three grades of hypertension [5]. In contrast, the 2024 ESC Guidelines define three broader office BP categories, introducing a new category – 'Elevated BP' – compared with the 2018 version, and do not establish different grades of hypertension [2]. The ACC/AHA 2025 Guidelines classify office BP into four different categories, including two stages of hypertension [6]. Although the categorisation and grading systems differ, both European Guidelines (2023 ESH and 2024 ESC) define hypertension at an office systolic BP (SBP) ≥140 mmHg and/or diastolic BP (DBP) ≥90 mmHg [2,5]. Conversely, the 2025 ACC/AHA Guidelines apply lower diagnostic thresholds, defining stage 1 hypertension as SBP ≥130 mmHg and/or DBP ≥80 mmHg [6] (Figure 1).

Extensive evidence supports the effectiveness of opportunistic screening in improving hypertension detection, with benefits that outweigh potential harms. Both the 2023 ESH and 2024 ESC Guidelines endorse opportunistic BP screening in the general adult population as a key strategy for the early detection of hypertension, particularly in adults from the age of 40 years and in adults at increased risk for hypertension [2,5]. Despite its value in detecting possible hypertension, opportunistic screening based on a single office BP measurement lacks sufficient diagnostic accuracy, especially near threshold values [2,5].

Office BP remains the gold standard for the diagnosis of hypertension [2,5,6]. Conventional office BP measurement is the most extensively studied method, through which the role of BP as a CV risk factor, the protective effects of antihypertensive treatment, and the thresholds and targets of therapeutic interventions have been established in randomised clinical outcome trials [5]. Therefore, despite recognised limitations and the increasing use of out-of-office BP measurements, office BP remains the most widely used and evidence-based method for diagnosing hypertension [2,5,6]. Nevertheless, all guidelines recommend confirmation of the diagnosis using ambulatory BP monitoring (ABPM) and/or home BP monitoring (HBPM) whenever feasible, particularly to identify white-coat and masked hypertension [2,5,6]. While ABPM is considered the reference method for out-of-office BP assessment, HBPM represents a practical, accessible, and low-cost alternative for longitudinal monitoring [5], complementing – but not replacing – office BP in guiding therapeutic decisions.

The three guidelines share very similar recommendations on how to proceed to accurately measure BP in the three different settings: office, ABPM or HBPM (Figure 2). They also recommend the use of clinically validated and calibrated devices with confirmed accuracy for BP measurement [2,5]. Healthcare professionals, patients, and caregivers are encouraged to consult authoritative online resources – such as www.stridebp.org – which provide regularly updated lists of clinically validated devices for office, HBPM and ABPM measurement in adults, children, and pregnant women [5,10].

Assess the patient

A comprehensive clinical evaluation is essential to support an accurate diagnosis and to inform pharmacological treatment decisions and follow-up strategies. Patient assessment should be tailored according to the severity of hypertension and individual clinical circumstances. Hypertension is frequently associated with coexisting cardiometabolic conditions [2,5]. Some common CV risk factors identified across the three Guidelines [2,5,6] include advanced age, male sex, smoking, dyslipidaemia, diabetes mellitus, chronic kidney disease (CKD), obesity, family history of premature CV disease (CVD), and unhealthy lifestyle behaviours such as physical inactivity and high sodium intake (Table 1). The 2023 ESH and 2024 ESC Guidelines recommend CV risk assessment using the Systematic COronary Risk Evaluation model 2 (SCORE2) and Systematic COronary Risk Evaluation model 2 for

Figure 1. Classification of office, home and ambulatory blood pressure according to the 2023–2024 European and 2025 American Guidelines. [a]In the 2023 ESH Guidelines, in addition to grades of hypertension, which are based on BP values, it is recommended to distinguish stage 1, 2, and 3 hypertensions. Stage 1: Uncomplicated hypertension without HMOD, diabetes, CVD and without CKD ≥ stage 3. Stage 2: Presence of HMOD, diabetes, or CKD stage 3. Stage 3: Presence of CVD or CKD stage 4 or 5. [b]Normal if SBP < 120 mmHg and DBP < 80. [c]Elevated if SBP 120 to 129 mmHg and DBP < 80. ABPM: ambulatory blood pressure monitoring; AHA/ACC: American College of Cardiology/American Heart Association; BP: blood pressure; CKD: chronic kidney disease; CVD: cardiovascular disease; DBP: diastolic blood pressure; ESH: European Society of Hypertension; ESC: European Society of Cardiology; HBPM: home blood pressure monitoring; HMOD: hypertension-mediated organ damage; SBP: systolic blood pressure. Adapted from Lauder et al., (2025) [9].

Older People (SCORE2-OP) systems for hypertensive patients who are not already at high or very high risk due to established CVD or CKD, long-standing or complicated diabetes, severe hypertension-mediated organ damage HMOD (e.g. left ventricular hypertrophy) or a markedly elevated

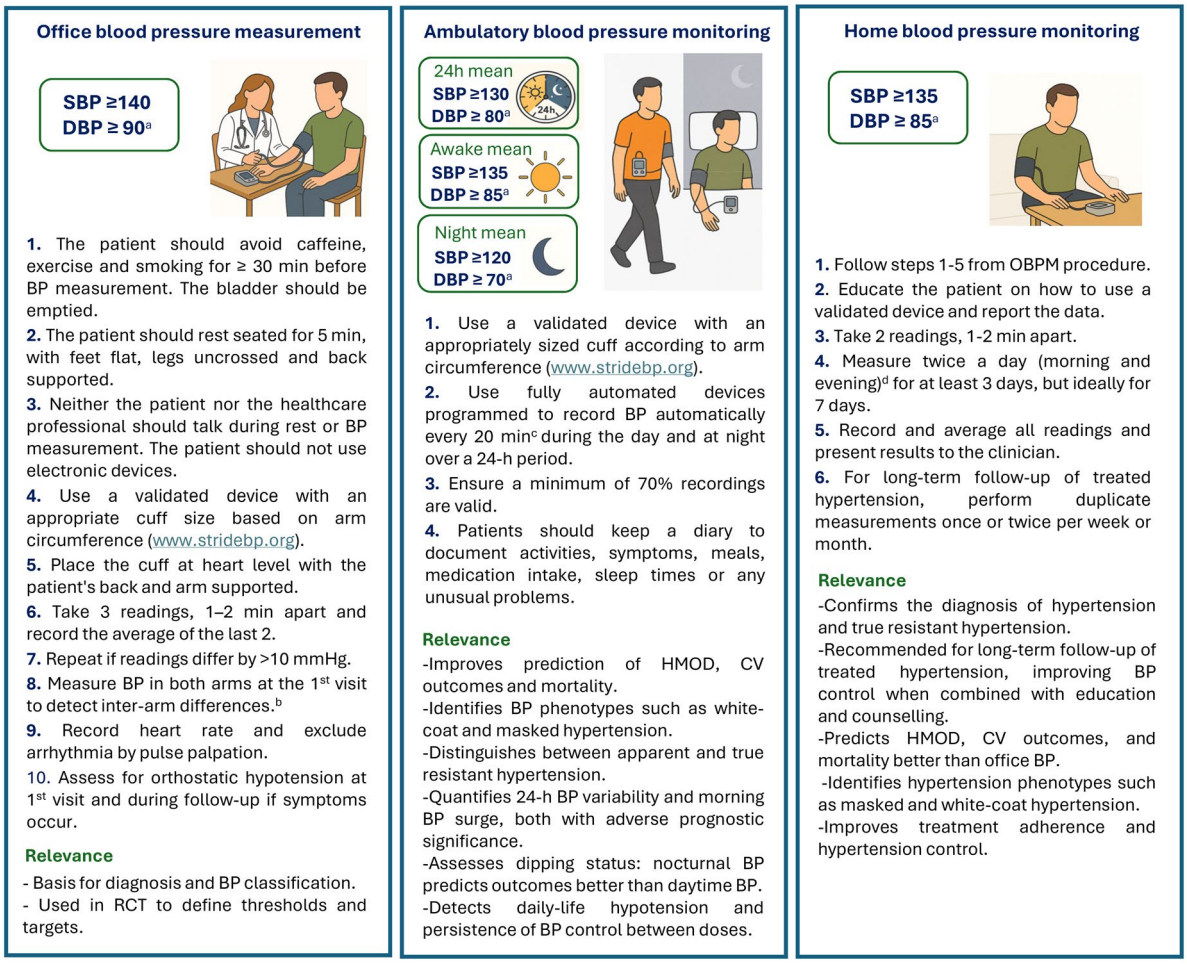


Figure 2. Procedures and recommendations for office, ambulatory, and home blood pressure measurement according to the 2023 ESH and 2024 ESC Guidelines. [a]Definition of hypertension according to the 2023 ESH and 2024 ESC Guidelines [2,5]. [b]A consistent inter-arm SBP difference >15–20 mmHg suggests atheromatous disease and increased CV risk. Subsequent measurements should be taken in the arm with the higher BP readings. [c]2023 ESH Guidelines recommend a minimum of 20 daytime and 7 night time valid readings for reliable 24-h ABPM. As device software may discard measurements and longer intervals (e.g. 60 min) may lead to inaccurate mean values, recording every 20 min throughout the day and night is advised to optimise data quality and capture prognostically relevant nocturnal BP [5]. [d]Before drug intake if treated. ABPM: ambulatory blood pressure monitoring; BP: blood pressure; CV: cardiovascular; CVD: cardiovascular disease; DBP: diastolic blood pressure; ESC: European Society of Cardiology; ESH: European Society of Hypertension; HBPM: home blood pressure monitoring; HMOD: hypertension-mediated organ damage; OBPM: office blood pressure measurement; RCT: randomised controlled trials; SBP: systolic blood pressure.

single risk factor (e.g. cholesterol, albuminuria) [2,5]. For patients with diabetes, CV risk should be estimated using the SCORE2-Diabetes model, which is calibrated to predict the 10-year risk of CVD in people with type 1 or type 2 diabetes [2]. The 2025 ACC/AHA Guidelines recommend the use of the Predicting Risk of Cardiovascular Disease Events (PREVENT™) tool to estimate the 10-year risk for CVD in adults with hypertension without clinical CVD, to guide BP thresholds and decisions regarding the initiation of antihypertensive therapy [6]. In general, both the 2023 ESH and 2024 ESC Guidelines provide closely aligned recommendations for patient assessment, which are summarised in Table 2. These recommendations comprise a thorough review of the patient's medical history including personal history and risk factors, signs and symptoms of HMOD, CVD, stroke and kidney disease, history and/or symptoms of possible secondary hypertension and medication history [2,5]. The recommendations regarding physical examination and routine laboratory testing are also highly consistent between the two Guidelines (Table 2). According to current guidelines, baseline patient assessment should include evaluation for HMOD, particularly cardiac and renal involvement, using routine investigations such as electrocardiogram (ECG), serum creatinine with estimated glomerular

Table 1. Factors that influence cardiovascular risk in patients with hypertension according to the 2023 ESH and 2024 ESC Guidelines.

Parameter for risk stratification, which are included in SCORE2 and SCORE2-OP
• Sex (men > women)
• Age
• Level of SBP
• Smoking – current or past history
• Non-HDL cholesterol
Established and suggested novel factors
• Family or parental history of early onset hypertension
• Personal history of malignant hypertension[a]
• Family history of premature CVD (men aged <55 years; women aged <65 years)
• Heart rate (resting values >80 bpm)[a]
• Low birth weight
• Sedentary lifestyle
• Overweight or obesity
• Diabetes
• Dyslipidemia
• Lp(a)[a]
• Uric acid (in pregnant women)[b]
• Adverse outcomes of pregnancy: recurrent pregnancy loss, preterm delivery, hypertensive disorders, gestational diabetes
• Early-onset menopause
• Frailty, functional capacities and autonomy status[a]
• Psychosocial and socioeconomic factors
• Migration[a]
• Environmental exposure to air pollution or noise
Additional clinical conditions or comorbidities
• True resistant hypertension
• Sleep disorders (including OSA)
• COPD[a]
• Gout[a]
• Chronic inflammatory diseases (e.g. systemic lupus erythematosus, rheumatoid arthritis, and psoriasis affecting 10% or more of body surface area or requiring systemic therapy)
• Metabolic dysfunction-associated fatty liver disease[a]
• Chronic infections (e.g. long COVID-19, human immunodeficiency virus)
• Migraine
• Depressive syndromes[a]
• Erectile dysfunction
• Auto-immune inflammatory diseases[c]
• Severe mental illness (major depressive disorder, bipolar disorder, and schizophrenia)[c]
Hypertension-mediated organ damage (HMOD)
• Increased large artery stiffness
• Pulse pressure (in older people) ≥60 mmHg[a]
• Carotid–femoral PWV >10 m/s in middle-aged people
• Presence of non-hemodynamically significant atheromatous plaque (stenosis) on imaging
• ECG LVH (Sokolow–Lyon index >35 mm, or R in aVL ≥11 mm; Cornell voltage-duration product (+6 mm in women) >2440 mm*ms, or Cornell voltage >28 mm in men or >20 mm in women)
• Echocardiographic LVH (LV mass index: men >50 g/m$^{2.7}$; women >47 g/m$^{2.7}$ (m = height in meters); indexation for BSA may be used in normal-weight patients: >115 g/m^2 in men and >95/m^2 in women
• Moderate increase of albuminuria 30–300 mg/24 h or elevated UACR (preferably in morning spot urine) 30 –300 mg/g.[a] Albuminuria ≥30 mg/g irrespective of eGFR[c]
• CKD stage 3 with eGFR 30–59 ml/min/1.73 m^2
• Ankle–brachial index <0.9
• Advanced retinopathy: haemorrhages or exudates, papilledema
Established cardiovascular and kidney disease
• Cerebrovascular disease: ischaemic stroke, cerebral haemorrhage, TIA
• Coronary artery disease: myocardial infarction, angina, myocardial revascularization
• Presence of hemodynamically significant atheromatous plaque (stenosis) on imaging
• Heart failure
• Peripheral artery disease
• Atrial fibrillation
• Severe albuminuria > 300 mg/24 h or UACR (preferably in morning spot urine) >300 mg/g. [a]Moderate or severe CKD: albuminuria of ≥30 mg/g (≥3 mg/mmol)[c]
• CKD stage 4 and 5, eGFR < 30 mL/min/1.73m^2[a]
Other
• Race/Ethnicity[b]

[a]Risk factor indicated only in the 2023 ESH Guidelines [5].
[b]In pregnant women according to 2024 ESC Guidelines [2].
[c]Risk factor indicated only in the ESC Guidelines [2].
Adapted from McEvoy et al. (2024) [2] and Mancia et al. (2023) [5].
BSA: body surface area; CKD: chronic kidney disease; COPD: chronic obstructive pulmonary disease; CVD: cardiovascular disease; ECG: electrocardiogram; eGFR: estimated glomerular filtration rate; HMOD: hypertension-mediated organ damage; LV: left ventricle; LVH: left ventricular hypertrophy; Lp(a): lipoprotein(a); OSA: obstructive sleep apnoea; PWV: pulse wave velocity; R: amplitude of the R wave; SBP: systolic blood pressure; SCORE: Systematic Coronary Risk Estimation; SCORE2: Systematic Coronary Risk Estimation 2; aVL: augmented vector left; TIA: transient ischaemic attack; UACR: urine albumin-to-creatinine ratio.

Table 2. Patient assessment according to the 2023 ESH and 2024 ESC Guidelines.

Medical History
Personal History and Risk Factors
• Time of the first diagnosis of hypertension, including records of any previous medical screening, hospitalisation
• Stable or rapidly increasing BP
• Recordings of current and past BP values by self BP measurements
• Family and personal history of hypertension, CVD (or associated CVD risk factors), stroke or kidney disease
• Smoking history
• Dietary history (salt, alcohol consumption
• Physical exercise/sedentary lifestyle
• Weight gain or loss in the past
• Migraine with aura
• History of erectile dysfunction
• Sleep history, snoring, sleep apnoea
• Distress or eustress with job or at home (subjective stress level)
• Long-term cancer survivor
• Autoimmune inflammatory diseases
• Human immunodeficiency virus
• Psychosocial factors (chronic stress, depression, social deprivation, low socio-economic status, discrimination, gender-based violence)
• Previous hypertension in pregnancy/pre-eclampsia and other pregnancy-related complications (gestational diabetes, miscarriage/ stillbirth, pre-term labour)
• Early menopause, polycystic ovary disease
History, signs and symptoms of HMOD, CVD, stroke and kidney disease
• Brain and eyes: headache, vertigo, syncope, impaired vision, TIA, sensory or motor deficit, stroke, carotid revascularization, cognitive impairment, memory loss, dementia (in older people)
• Heart: chest pain, shortness of breath, edoema, myocardial infarction, coronary revascularization, syncope, history of palpitations, arrhythmias (especially AF), heart failure
• Kidney: thirst, polyuria, nocturia, haematuria, urinary tract infections, Patient or family history of CKD (e.g. polycystic kidney disease)
• Peripheral arteries: cold extremities, intermittent claudication, pain-free walking distance, pain at rest, ulcer or necrosis, peripheral revascularization
History and/or symptoms of possible secondary hypertension
• Young onset of grade 2 or 3 hypertension (<40 years), or sudden development of hypertension or rapidly worsening BP in older patients[a]
• All causes: BP > 160/100 mmHg in young adults (<40 years), BP > 180/110 mmHg irrespective of age [b]
• Resistant hypertension. Hypertensive emergency
• History of repetitive renal/urinary tract disease
• Repetitive episodes of sweating, headache, anxiety or palpitations, suggestive of pheochromocytoma
• History of spontaneous or diuretic-provoked hypokalaemia, episodes of muscle weakness and tetany (hyperaldosteronism)
• Symptoms suggestive of thyroid disease or hyperparathyroidism
• History of or current pregnancy, postmenopausal status and oral contraceptive use or hormonal substitution
• Obstructive sleep apnoea syndrome
• Renovascular hypertension
• Renoparenchymal hypertension
• Phaeochromocytoma/paraganglioma
Medication History
• Current/past antihypertensive medications including their effectiveness and intolerance
• Adherence to and persistence with prior and current treatments.
• Use of drugs or substances that may increase BP
Physical Examination
• Weight and height with calculation of BMI
• Waist circumference
• Neurological examination and cognitive status
• Fundoscopic examination for hypertensive retinopathy in emergencies
• Auscultation of heart and carotid arteries
• Auscultation of abdominal aorta, iliac, and femoral arteries
• Palpation of carotid and peripheral arteries
• Comparison of BP in both arms (at least once)
• Ankle–brachial index
• Skin inspection: cafe-au-lait patches of neurofibromatosis (pheochromocytoma/paraganglioma)
• Kidney palpation for signs of renal enlargement in polycystic kidney disease
• Auscultation of heart and renal arteries for murmurs or bruits indicative of aortic coarctation, or renovascular hypertension
• Signs of Cushing's disease or acromegaly
• Signs of thyroid disease or parathyroid disease
• Comparison of radial with femoral pulse, inter-arm BP difference in young individuals with aortic coarctation (aortic murmur may also be heard)
• Neck circumference of >40 cm in men, >35 cm in women (OSAS)
Diagnostic tests and procedures
Routine Laboratory Tests[c]
• Haemoglobin and/or haematocrit
• Fasting blood glucose and HbA1[c]
• Blood lipids: total cholesterol, LDL cholesterol, HDL cholesterol, triglycerides
• Blood sodium and potassium, calcium, and TSH
• Blood uric acid
• Blood creatinine (and/or cystatin C) for estimating GFR with eGFR[c] formulas
• Blood calcium

(*Continued*)

Table 2. Continued.

Medical History
• Urine analysis (first voided urine in the morning), multicomponent dipstick test in all patients, urinary albumin/creatinine ratio, microscopic examination in selected patients
• 12-lead ECG
Optional Tests to Assess HMOD or established CV
• Echocardiography
• Large artery stiffness: carotid– femoral pulse wave velocity or brachial– ankle pulse wave velocity
• Carotid or femoral artery ultrasound imaging
• Coronary artery calcium scan by cardiac CT
• Abdominal aorta ultrasound
• Kidney ultrasound and Doppler examination
• Spectral doppler ultrasonography[a]
• Ankle–brachial index
• Retina microvasculature[a]
• Cognitive function testing (MMSE, MoCA)[a]
• Brain imaging (CT, MRI)[a]
• Fundoscopy
• High-sensitivity cardiac troponin and/or NT-proBNP[b]
When to Refer a Patient[a]
To a Specialist
• Suspected secondary hypertension, depending on age
• To exclude secondary hypertension in younger patients (<40 years) with grade 2 or 3 hypertension
• Sudden onset or aggravation of hypertension
• Patients with treatment resistant hypertension
• Need of more detailed assessment of HMOD, which might influence decision making (treatment and follow-up)
• Hypertension in pregnancy
• Requirement of more in-depth specialist evaluation from the referring physician
To a hospital
• Hypertensive emergencies, i.e. in severe hypertension (grade 3) associated with acute symptomatic HMOD
• Severe hypertension with conditions that need intensified BP management: acute stroke, complicated aortic aneurysm, acute heart failure, acute coronary syndrome, acute kidney failure
• Hypertension caused by phaeochromocytoma or exogenous sympathomimetic substances (e.g. substance abuse)
• Severe forms of HDP including preeclampsia/eclampsia

[a]Indicated in the 2023 ESH Guidelines only [5].
[b]Indicated in the ESC Guidelines only [2].
[c]Can be adapted according to the clinical circumstance.
Adapted from McEvoy et al. (2024) [2] and Mancia et al. (2023) [5].
AF: atrial fibrillation; BMI: body mass index; BP: blood pressure; CKD: chronic kidney disease; CT: computed tomography; CVD: cardiovascular disease; ECG: electrocardiogram; eGFR: estimated glomerular filtration rate; GFR: glomerular filtration rate; HbA1c: glycated haemoglobin A1c; HDL: high-density lipoprotein; HDP: hypertensive disorders of pregnancy; HMOD: hypertension-mediated organ damage; LDL: low-density lipoprotein; MMSE: Mini-Mental State Examination; MoCA: Montreal Cognitive Assessment; MRI: magnetic resonance imaging; NT-proBNP: N-terminal pro-B-type natriuretic peptide; OSAS: obstructive sleep apnoea syndrome; TSH: thyroid-stimulating hormone.

filtration rate (eGFR), and assessment of albuminuria, while more advanced imaging or vascular studies are reserved for selected cases when clinically indicated or for further risk stratification [2,5,6]. The recommendations for optional tests vary slightly between the two Guidelines; notably, the 2023 ESH Guidelines recommend additional optional investigations compared with the 2024 ESC Guidelines, such as spectral Doppler ultrasonography, assessment of retinal microvasculature, cognitive function testing, and brain imaging [5]. The 2025 ACC/AHA Guidelines discuss patient assessment less extensively than European documents, providing a concise yet comprehensive framework to guide clinical evaluation. They emphasise detailed medical history and physical examination, together with a core set of laboratory investigations to establish baseline CV risk and inform management decisions [6].

Prescribe lifestyle interventions and/or pharmacological treatment

Lifestyle interventions

Lifestyle interventions are effective in lowering BP in patients with hypertension and offer additional advantages, including enhanced response to antihypertensive therapy, improved CV health, and reduced risk of other chronic diseases. These interventions also play a key role in the prevention of hypertension and, in a subset of patients, may be sufficient to achieve BP control when used alone. Nevertheless, lifestyle changes should not delay the initiation of drug treatment in patients for whom the benefits of antihypertensive therapy are established, and BP reduction cannot be achieved with lifestyle modifications alone. Indeed, most patients with hypertension will require both lifestyle changes

and pharmacological therapy [5]. The three Guidelines recommend lifestyle modifications irrespective of BP level, including weight loss, adherence to the Dietary Approaches to Stop Hypertension (DASH) or Mediterranean diet, salt reduction, increased potassium intake, regular physical activity and structured exercise, smoking cessation and moderation of alcohol consumption or preferably abstinence according to 2023 ESH Guidelines [2,5,6]. The main limitation of non-pharmacological interventions is poor long-term adherence, often due to their impact on daily routines or associated costs not covered by healthcare systems [5]. To address this, physicians should implement a follow-up plan to monitor adherence and assess BP control, thereby reducing the risk of prolonged uncontrolled hypertension [5]. Figure 3 summarise the key recommendations on lifestyle interventions for BP and CV risk reduction, reflecting a consistent alignment between the 2023 ESH and 2024 ESC Guidelines [2,5].

Pharmacological treatment

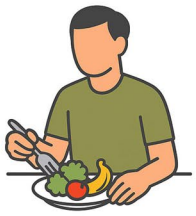
The initiation of pharmacological treatment to lower BP remains a matter of debate, particularly as the three guidelines define different BP categories with distinct thresholds. Figure 4A summarises the main strategies for initiating BP-lowering treatment based on confirmed BP categories and lists the main clinical recommendations according to the 2023 ESH and 2024 ESC Guidelines [2,5].

In line with the 2023 ESH Guidelines, patients with Grade 1, 2 or 3 hypertension (BP ≥140/90 mmHg) who are symptomatic or have HMOD, CKD stage ≥ 3, or CVD should start both lifestyle interventions and antihypertensive drug therapy immediately [5]. However, for patients with grade 1 hypertension at the lower end of the BP spectrum, without evidence of HMOD and with low CV risk, initiating treatment with lifestyle modifications alone may be considered. The duration of lifestyle-only intervention can range from approximately 3 to 6 months and should be tailored according to the initial BP level within the grade 1 range (e.g. values close to 140 mmHg SBP), the feasibility of implementing lifestyle changes, and expected adherence – factors that influence the likelihood of achieving adequate BP control [5]. In contrast, the 2024 ESC Guidelines consider all patients with hypertension (BP ≥140/90 mmHg) to be at sufficiently high CV risk to warrant immediate initiation of pharmacological treatment alongside lifestyle modifications [2]. Moreover, in adults with elevated BP (SBP 130–139 mmHg) and sufficiently high CV risk, the 2024 ESC Guidelines recommend initiating pharmacological BP-lowering treatment after 3 months of lifestyle intervention if BP remains ≥130/80 mmHg to reduce CV risk. Lifestyle interventions alone should be implemented in adults with elevated BP (SBP 120–139 mmHg and/or DBP 70–89 mmHg) and low to medium CVD risk (<10% over 10 years) to lower CVD risk [2]. In contrast, the 2023 ESH Guidelines advise against initiating antihypertensive treatment in individuals with high-normal BP and low CV risk, recommending it only in those with a history of CVD – mainly coronary artery disease – when BP is ≥130/80 mmHg [5]. To date, randomised clinical outcome trials have primarily demonstrated the benefit of antihypertensive therapy in patients with BP ≥140/90 mmHg or in those at elevated CV risk, while evidence supporting routine pharmacological treatment below this threshold in low-risk individuals remains limited [2,5]. Additionally, all three guidelines recognise the presence of HMOD as a high-risk marker that favours earlier initiation and intensification of antihypertensive therapy [2,5,6]. The supplementary data present the risk stratification by grade and stage of hypertension for initiating drug therapy and follow-up strategies according to the 2023 ESH Guidelines (Supplementary Figure 1) [5], as well as the CV risk conditions warranting BP-lowering treatment in adults with elevated BP recommended by the 2024 ESC Guidelines (Supplementary Figure 2) [2]. The 2025 AHA/ACC Guidelines recommend antihypertensive medication for all adults with average BP ≥140/90 mmHg, irrespective of age or baseline CV risk, and for individuals with BP ≥130/80 mmHg who have established CVD, diabetes, CKD, or a 10-year predicted CVD risk ≥7.5% as assessed by the PREVENT™ tool. For adults with BP ≥130/80 mmHg but lower CV risk (<7.5%), initiation of pharmacological treatment is advised if BP remains uncontrolled after a 3–6-month trial of lifestyle interventions [6].

All guidelines are consistent in recommending the same classes of first-line antihypertensive drugs, advocating for the use of a dual fixed-dose single-pill combination as initial therapy, as this approach reduces pill burden and promotes better treatment adherence [2,5,6]. The antihypertensive drugs include angiotensin-converting enzyme inhibitors (ACEi), angiotensin receptor blockers (ARBs),

Promote weight loss and recommend adherence to a healthy diet

- Combine a **low-calorie diet with daily physical activity** in patients who are obese or overweight
- Monitor weight and circumference waist. A stable and **healthy BMI** (e.g. 20–25 kg/m2[a]) and **waist circumference values** (e.g. <94 cm in men and <80 cm in women[a]) are recommended to **reduce BP and CVD risk**
- Follow a **Mediterranean** or **DASH diet**
- Prefer more plant-based food and less animal-based food, including **vegetables, fruits, nuts, beans, seeds and vegetable oils**
- Recommend more **lean protein** (e.g. fish, poultry)
- Limit fatty meats, full fat dairy, sugar, sweets and sweetened beverages such as soft drinks and fruit juices (starting at young age)



- **Increase potassium intake (0.5-1-0g/day[a])** through sodium substitution with potassium-enriched salt (comprising 75% sodium chloride and 25% potassium chloride) or through diets rich in fruits and vegetables. In patients with CKD or taking potassium-sparing medication, such as some diuretics, ACE inhibitors, ARBs, or spironolactone, **monitoring serum levels of potassium** should be considered if dietary potassium is being increased [a]

Recommend daily physical, regular exercise and stress management

- **Reduce sedentary behavior** (e.g. sit less) and incorporate **physical activity daily** (e.g. walking, cycling)
- **Moderate intensity aerobic exercise** of ≥150 min/week (≥30 min, 5–7 days/week) **or** alternatively 75 min of **vigorous intensity aerobic exercise per week over 3 days** are recommended and should be **complemented with low- or moderate-intensity dynamic or isometric resistance training (2–3 times/week)** to reduce BP and CVD risk.
- Reduce stress via controlled **breathing exercises**, **mindfulness-based exercise** and **meditation**

Advise and recommend adherence to a healthy lifestyle

- **Restrict salt consumption to <5 g** (~2 g sodium) or 1 teaspoon/day
- **Avoid excessive (binge) drinking and limit alcohol intake** close to **abstinence**, particularly if intake is ≥ 3 drinks/day [b,c]
- Recommend **stopping tobacco smoking**. Supportive care and referral to smoking cessation programs are recommended for all smokers

Recommend minimize exposure to noise and air pollution[c]

- **Reduce** indoor exposure to **noise** and **air pollution** (e.g. modify the location, timing and type of outdoor activities)

Figure 3. Recommended lifestyle interventions for patients with elevated blood pressure or hypertension according to the 2023 ESH and 2024 ESC Guidelines. [a]Reference value or recommendation as defined in the 2024 ESC Guidelines [2]. [b]About 350 ml of regular beer containing 5% alcohol by volume or 150 ml of wine containing 12% alcohol by volume [9] [c]Reference value or recommendation as defined in the 2023 ESH Guidelines [5]. Adapted from McEvoy et al., (2024) [2] and Mancia et al., (2023) [5]. ACE inhibitors: Angiotensin-Converting Enzyme inhibitors; ARBs: Angiotensin Receptor Blockers; BMI: Body Mass Index; BP: Blood Pressure; CKD: Chronic Kidney Disease; CVD: Cardiovascular Disease; DASH: Dietary Approaches to Stop Hypertension.

dihydropyridine calcium channel blockers (CCBs), and diuretics (thiazides and thiazide-like diuretics such as hydrochlorothiazide, chlorthalidone, and indapamide) [2,5,6]. Additionally, beta-blockers (BB) are recommended as first-line therapy only by the 2023 ESH Guidelines in specific situations: chronic coronary syndromes, anti-ischaemic therapy, post-myocardial infarction, arrhythmias, angina, known incomplete revascularisation, heart failure, acute coronary syndrome, in women of child-bearing potential or planning pregnancy, including those with hypertensive disorders of pregnancy [5]. Beyond these indications, BB therapy may also be advantageous in several other conditions, such as migraine prophylaxis, hyperthyroidism, hypertension with elevated resting heart rate >80 bpm, orthostatic hypertension, chronic obstructive pulmonary disease, glaucoma, psychiatric and anxiety disorders, and others [5]. The 2024 ESC and 2025 AHA/ACC Guidelines do not recommend BB as first-line agents unless in patients with angina, post-myocardial infarction, systolic heart failure, or for heart rate control [5,6]. The European pharmacological algorithms for the management of patients with hypertension are outlined in Figure 4B. Overall, the pharmacological treatment algorithms proposed by the 2023 ESH and 2024 ESC Guidelines are broadly similar in structure and therapeutic approach [2,5]. Initial treatment with combination antihypertensive therapy (dual combination) is recommended for most patients with confirmed hypertension (BP ≥140/90 mmHg), rather than monotherapy. Preferred combinations should comprise a renin-angiotensin system (RAS) blocker (either an ACE inhibitor or an ARB) with a CCB or thiazide/thiazide-like diuretic, ideally as a fixed-dose single-pill combination. Combining two RAS blockers (ACE inhibitor and an ARB) is not recommended [2,5]. Initiating treatment with monotherapy may be appropriate in selected patient groups only, such as those with frailty or advanced age, which are criteria recognised in both the 2023 ESH and 2024 ESC Guidelines [2,5]. Monotherapy may also be considered in very high CV-risk patients with high-normal BP, according to the 2023 ESH Guidelines [5], and in individuals classified by the 2024 ESC Guidelines as having elevated BP or those with symptomatic orthostatic hypotension [2]. Beta-blockers may be added at any step of the treatment algorithm, depending on the clinical situation. Of note, additional therapies should be considered in patients with true resistant hypertension, heart failure and CKD as detailed in the European Guidelines [2,5].

The main difference between the two pharmacological algorithms lies in the dosing for both initial dual therapy (first step) and subsequent triple therapy (second step): while the 2023 ESH Guidelines recommend the use of full-dose combinations if well tolerated [5], the 2024 ESC Guidelines advocate initiating both dual and triple antihypertensive therapy at low doses while monitoring tolerance, and subsequently up-titrating doses as needed [2]. The use of a combination therapy strategy is supported by evidence showing that it provides greater BP reduction by targeting multiple pathophysiological mechanisms underlying BP dysregulation [2]. Regarding office BP targets in the general adult hypertensive population (Supplementary Figure 3), the 2023 ESH Guidelines define the first objective of antihypertensive treatment as lowering BP to <140/80 mmHg in most patients, as this accounts for the major portion of the protective effect of BP reduction [5]. If drug treatment is well tolerated, treated SBP values should be targeted to 130 mmHg or lower in most patients up to 79 years old [5]. The 2024 ESC Guidelines recommend targeting treated SBP to 120–129 mmHg in most adults if treatment is well tolerated, to reduce CVD risk. If BP-lowering treatment is poorly tolerated and achieving a SBP of 120–129 mmHg is not feasible, the recommendation is to aim for the lowest systolic level reasonably achievable [2]. The 2025 AHA/ACC Guidelines recommend a general BP treatment target of <130/80 mmHg for most adults, with encouragement to achieve SBP levels <120 mmHg when tolerated [6] (Supplementary Figure 3). No distinct target is proposed for older or frail individuals; instead, clinical judgement is advised to balance potential benefits and risks, avoiding treatment-related adverse effects. Individualisation of targets is recommended in patients for whom intensive BP lowering may not be appropriate, ensuring safety while pursuing optimal CV protection [6].

The European Guidelines suggest an approach for older adults, based on their level of functional capacity and autonomy, as outlined in Supplementary Figure 4 [2,5]. Both guidelines endorse the use of the visual numeric scale (Clinical Frailty Scale) based on the Canadian Study of Health and Ageing (CSHA) score, which serves as a practical tool for the initial profiling of patients aged 80 and over to guide adaptation of antihypertensive strategies [11].

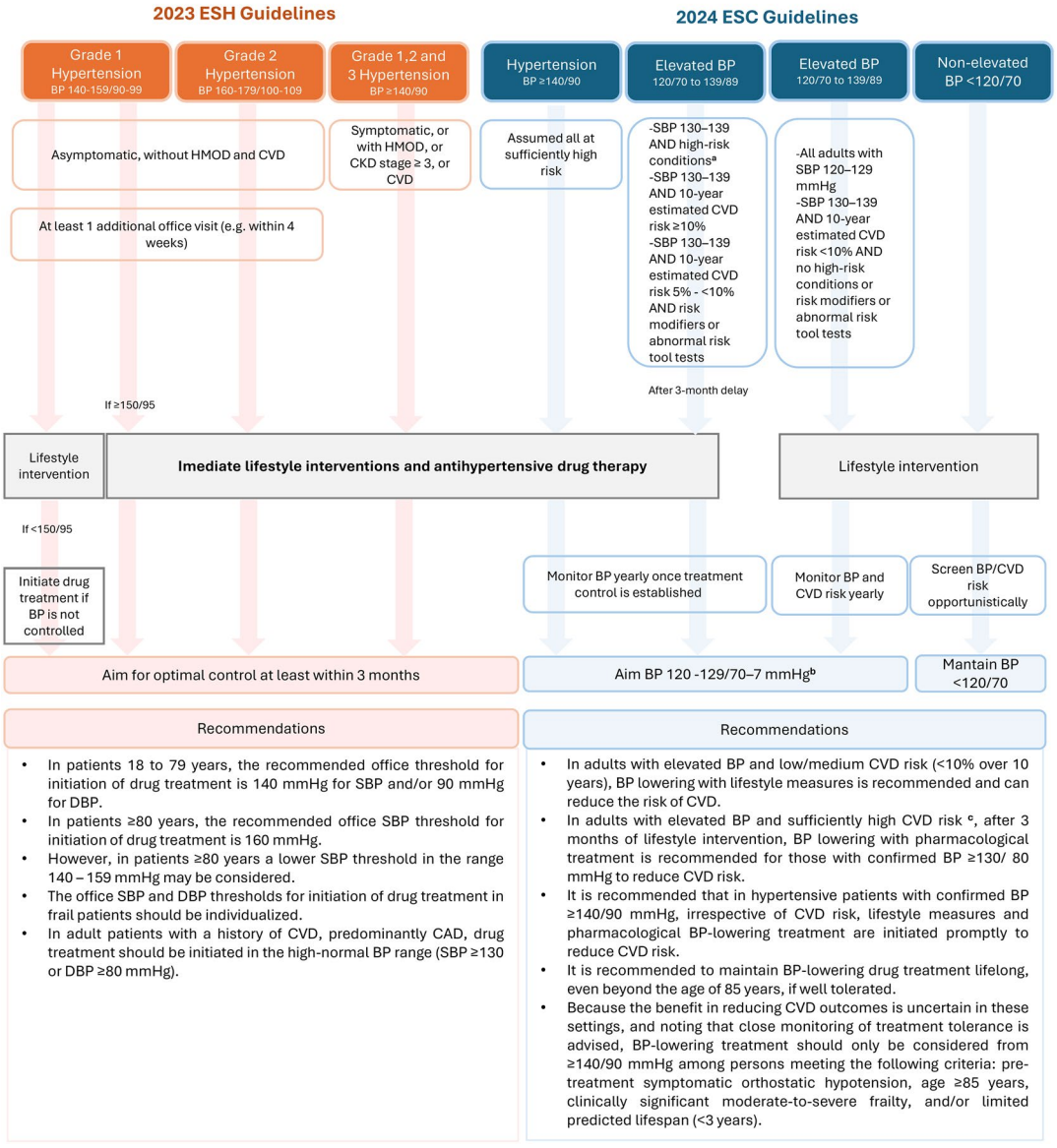


Figure 4.(A) Initiation of blood pressure-lowering treatment based on confirmed blood pressure categories and list of the main clinical recommendations. (B) Pharmacological treatment algorithms for hypertension management according to the 2023 ESH and 2024 ESC Guidelines. [a]e.g. established CVD, diabetes mellitus, CKD, FH or HMOD. [b]Caution in adults with orthostatic hypotension, moderate-to-severe frailty, limited life expectancy, and older patients (aged ≥85 years). [c]10-year estimated CVD risk of ≥10%; or 10-year estimated CVD risk of 5% - ≤10% plus risk modifiers or abnormal risk tool tests; or high-risk conditions (e.g. established CVD, diabetes, moderate or severe CKD, familial hypercholesterolaemia, or hypertension-mediated organ damage). [d]Use of Diuretics: –Consider transition to Loop Diuretic if eGFR is between 30 to 45 ml/min/1.73 m^2; –If eGFR <30 ml/min/1.73 m^2 use Loop Diuretic. [e]Controlled below 140/90mmHg. [f]When SBP is 140mmHg or DBP is 90 mmHg provided that: –maximum recommended and tolerated doses of a three-drug combination comprising a RAS blocker (either an ACEi or an ARB), a CCB and a Thiazide/Thiazide-like diuretic were used; –adequate BP control has been confirmed by ABPM or by HBPM if ABPM is not feasible; –various causes of pseudo-resistant hypertension (especially poor medication adherence) and secondary hypertension have been excluded. [g]Low risk hypertension and BP <150/95 mmHg or High-normal BP and very high CV risk or frail patients and/or advanced age. [h]BB should be used as guideline directed medical therapy in respective indications or considered in several other conditions (chronic coronary syndromes; antiischemic therapy; postmyocardial infarction: arrhythmias, angina, known incomplete re-vascularization, HF; acute coronary syndrome; HFrEF and HFpEF if coronary disease (ischemia); arrhythmias and tachycardia; atrial fibrillation: prevention, rhythm control, heart rate control; women with child-bearing potential/planning pregnancy; hypertension disorders in pregnancy). [i]Elevated BP category (120/70–139/89 mmHg) or moderate-to-severe frailty or symptomatic orthostatic hypotension or age ≥85 years. [j]Angina, post-myocardial infarction, systolic heart failure, or heart rate control. [k]If BP is not controlled with a three-drug combination and in whom spironolactone is not effective or tolerated, treatment with eplerenone instead of spironolactone, or the addition of a beta-blocker if not already indicated and, next, a centrally acting BP-lowering medication, an alpha-blocker, hydralazine, or a potassium-sparing diuretic should be considered.

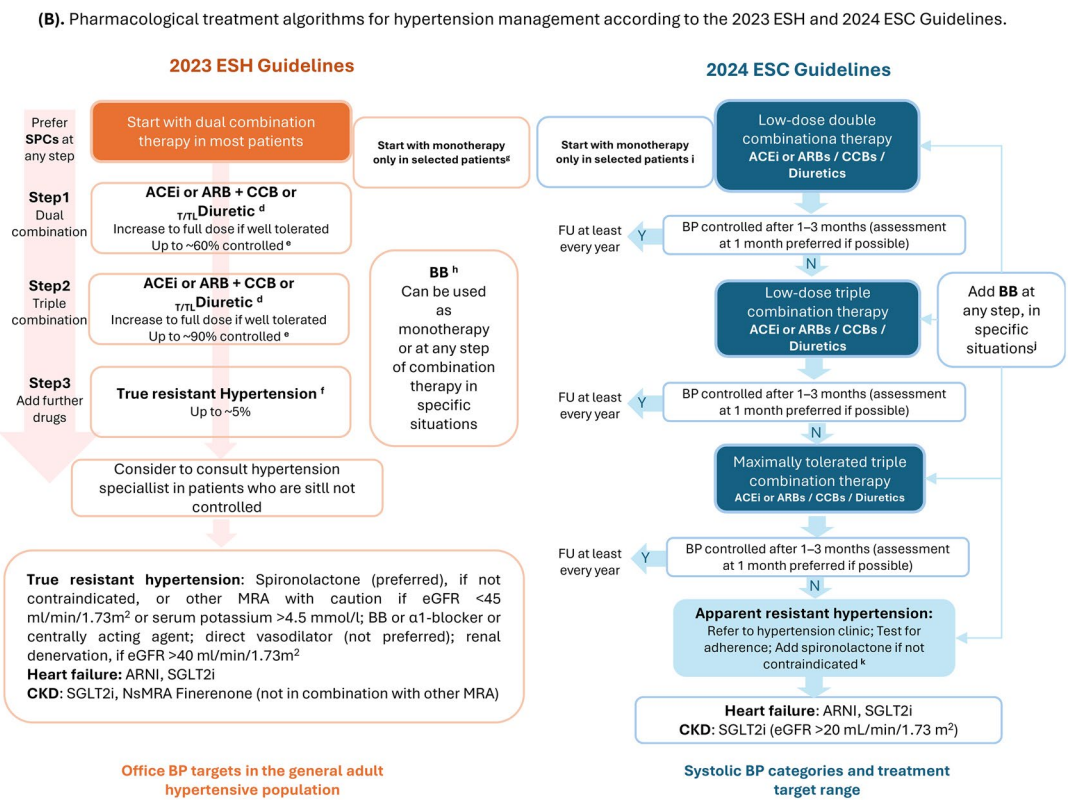


Figure 4. Continued.

Evaluate response

Long-term use of BP-lowering therapy is required to sustain BP control and reduce CVD risk [2]. It is essential to evaluate BP response after treatment initiation to assess therapeutic effectiveness and guide any necessary adjustments. Assessment of treatment tolerability, safety parameters (e.g. estimated glomerular filtration rate, serum potassium), changes in the risk factor profile, HMOD, comorbidities, and adherence is also essential during patient follow-up [2,5].

Incorporating a patient-centred approach is critical when evaluating response and ensuring long-term treatment success. This involves actively engaging patients as partners in care, acknowledging their preferences, values, and concerns, and ensuring they understand the rationale, benefits, and potential harms of antihypertensive therapy [2]. Improved patient satisfaction, adherence and treatment outcomes have all been associated with this approach, particularly in chronic conditions such as hypertension [2]. Adherence should be routinely assessed during follow-up. Regular medication reviews help identify adverse effects, optimise dosing, reduce regimen complexity (e.g. by using single-pill combinations), and address potential barriers such as cost or lack of social support. These measures contribute to improved persistence and long-term BP control. Self-care plays a key role in hypertension management and includes adherence to healthy lifestyle behaviours and regular self-monitoring of BP. When correctly used, validated digital devices can support early detection of elevated BP and facilitate timely therapeutic adjustments in coordination with healthcare providers [2].

All three major guidelines – 2023 ESH, 2024 ESC and 2025 AHA/ACC hypertension guidelines – endorse the use of team-based or multidisciplinary care models as an effective strategy to improve BP control [2,5,6]. Evidence from randomised controlled trials and systematic reviews consistently demonstrate that such approaches, particularly those involving pharmacists and nurses, result in greater reductions in systolic and DBP, improved adherence, and higher rates of BP target achievement compared with usual physician-only care. Pharmacists and community pharmacies play a pivotal role by facilitating medication reviews, titration under collaborative agreements, and patient education, while nurses contribute to diagnosis, HBPM, treatment delivery, and long-term follow-up. By integrating these healthcare professionals into structured, collaborative frameworks, team-based care

enhances treatment continuity, optimises resource use, and strengthens patient engagement in hypertension management [2,5,6].

The 2023 ESH Guidelines recommend BP response assessment after treatment initiation (at 3 months), as well as during short-term (3–12 months) and long-term (beyond 1 year) follow-up [5]. The 2024 ESC Guidelines recommend follow-up 1–3 months after initiating or titrating antihypertensive therapy (preferably after 1 month with a general practitioner or hospital specialist) to assess treatment tolerance, safety, and the full BP-lowering effect of pharmacological therapy. Once BP is controlled and stable, at least annual follow-up is advised to re-evaluate BP levels, CV risk factors, and long-term medication efficacy [2]. The 2025 AHA/ACC Guidelines emphasise that the frequency of follow-up should be individualised according to the stage of hypertension, presence of target organ damage, use of antihypertensive medication, and the level of BP control. Adults with uncontrolled hypertension who are started on new or intensified pharmacological therapy should undergo follow-up assessments at monthly intervals to evaluate medication adherence, treatment response, and potential adverse effects until satisfactory BP control is achieved [6]. The main aspects that should be evaluated and considered during all follow-up phases are summarised in Supplementary Table 1 according to ESH Guidelines [9].

Finally, Figure 5 synthesise the algorithm based on the M.A.P.E. (Measure, Assess, Prescribe, Evaluate) framework, which integrates the key recommendations from the 2023–2025 hypertension guidelines discussed in this consensus. It provides practical guidance for family physicians and specialist clinicians to support evidence-based decision-making aimed at improving BP control and CV outcomes.

Portuguese consensus statement

This consensus document represents a joint, society-endorsed effort to translate partially divergent international hypertension guidelines into a coherent and clinically applicable framework. While the 2023 ESH, 2024 ESC, and 2025 ACC/AHA guidelines are all grounded in high-quality evidence, differences in interpretation of epidemiological data, trial evidence, and risk thresholds have resulted in distinct recommendations that may challenge everyday clinical decision-making.

The Portuguese Society of Hypertension and the Portuguese Society of Cardiology acknowledge these differences and, through this consensus, explicitly define their shared position on key aspects of hypertension management. In doing so, particular emphasis is placed on evidence derived from randomised controlled trials, feasibility within routine clinical practice, and patient safety. Importantly, this consensus recognises that all outcome-driven evidence supporting antihypertensive treatment initiation and target achievement is based on office BP measurements. While ABPM and/or HBPM monitoring are invaluable tools for diagnosis refinement and follow-up, they do not constitute independent treatment thresholds. Similarly, although lower BP levels are associated with lower CV risk, the absence of randomised trial evidence supporting universal pharmacological treatment below 140/90 mmHg in low-risk individuals underpins the conservative diagnostic and therapeutic thresholds adopted in this consensus.

The key areas of convergence and divergence across the 2023 ESH, 2024 ESC and 2025 ACC/AHA guidelines, together with the corresponding consensus positions endorsed by the Portuguese Society of Hypertension and the Portuguese Society of Cardiology, are summarised in Table 3. This table translates guideline differences into operational clinical recommendations to support decision-making in routine clinical practice. Additional explanatory text detailing the rationale underpinning the society-endorsed positions is provided in Supplementary Table 2, offering further clarification on the interpretation and application of these recommendations.

Conclusions

Across the 2023–2025 European and American hypertension guidelines, there is broad consensus on the fundamental pillars of effective BP management: accurate BP measurement, timely identification of high-risk patients, implementation of evidence-based lifestyle interventions, and the use of well-established first-line antihypertensive drug classes – preferably in fixed-dose single-pill combinations – to improve adherence and therapeutic effectiveness. Differences primarily arise in BP classification, diagnostic and treatment thresholds, dosing strategies, and recommended BP targets.

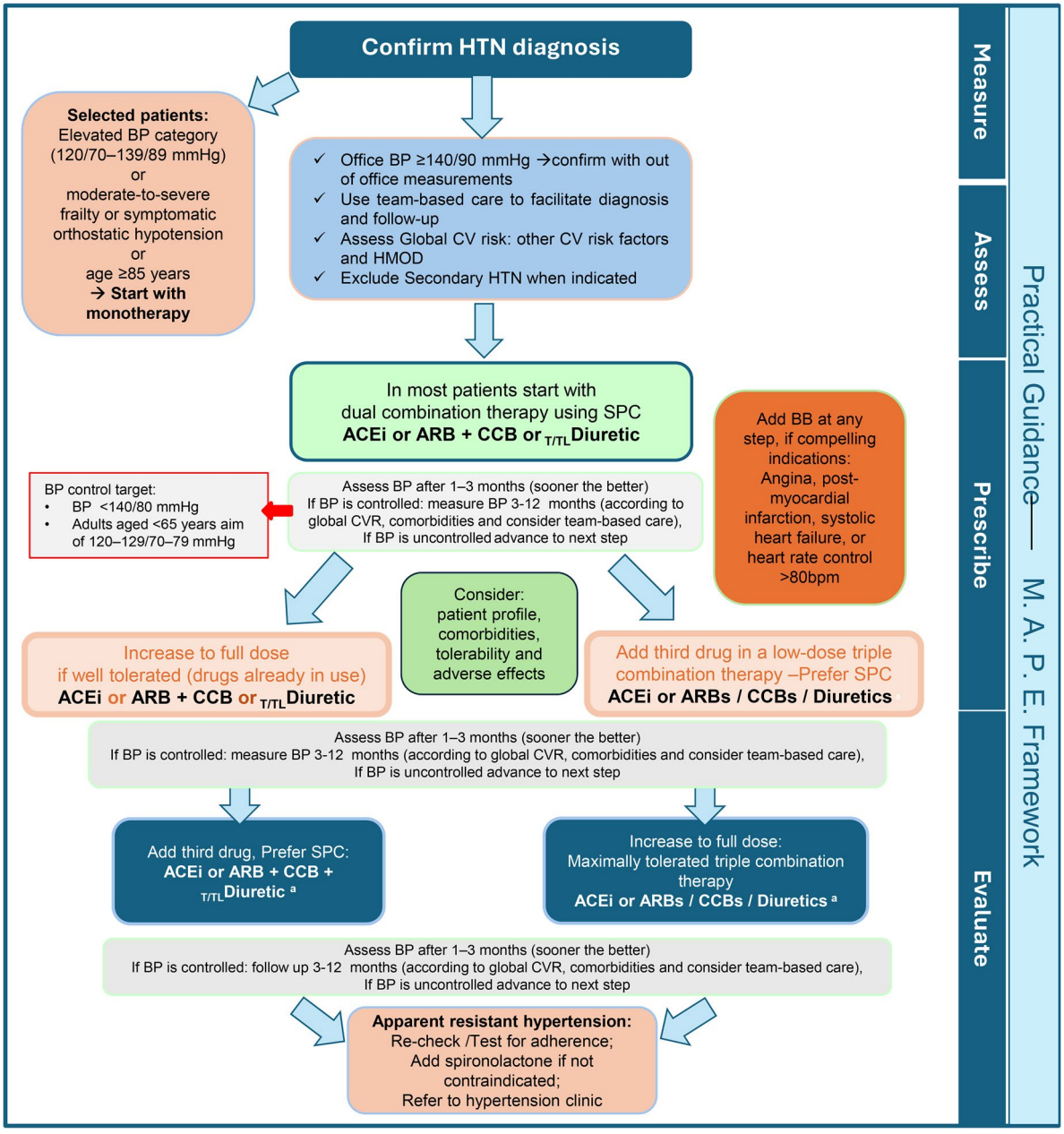


Figure 5. Practical summary algorithm based on the M.A.P.E. (Measure, Assess, Prescribe, Evaluate) framework integrating key recommendations from the 2023–2025 European and American hypertension guidelines. ACEi: angiotensin-converting enzyme inhibitor; ARB: angiotensin receptor blocker; BB: Beta-blocker; BP: blood pressure; CCB: calcium channel blocker; CV: cardiovascular; CVR: cardiovascular risk; HMOD: hypertension-mediated organ damage; HTN: hypertension; SPC: single-pill combination; T/TL diuretic: thiazide or thiazide-like diuretic.

Table 3. Comparison of the 2023 ESH, 2024 ESC and 2025 ACC/AHA hypertension guidelines, and the corresponding consensus position endorsed by the Portuguese Society of Hypertension and the Portuguese Society of Cardiology.

Domain	ESH 2023	ESC 2024	ACC/AHA 2025	PSH/PSC Consensus Position
Diagnostic threshold	≥140/90 mmHg	≥140/90 mmHg	≥130/80 mmHg	≥140/90 mmHg
Reference BP for treatment	Office BP	Office BP	Office BP	Office BP (gold standard)
ABPM / HBPM	Confirm diagnosis	Confirm diagnosis	Confirm diagnosis	Diagnostic & follow-up support, not treatment thresholds
Drug initiation <140/90	Selective	Broad (high risk)	Yes (risk-based)	Individualised only in high-risk patients
Initial therapy	Dual SPC	Dual SPC	Dual SPC	Dual SPC for most patients
Beta-blockers first line	Selected indications	Selected	Selected	Only with specific indications
SBP target	~130 mmHg	120–129 mmHg	<130 mmHg	~120 mmHg if tolerated

This Portuguese consensus statement reinforces the importance of a patient-centred, risk-based, and multidisciplinary approach to hypertension care. By integrating key areas of convergence and recognising the divergences across European and American recommendations, it provides a clear and practical framework to support clinical decision-making.

The M.A.P.E.-based approach (Measure, Assess, Prescribe, Evaluate) aims to facilitate real-world implementation of the 2023–2025 hypertension guidelines, particularly in settings challenged by heavy clinical workloads, limited consultation time, and the complexity of extensive guideline documents. Consistent with all major guidelines, this consensus highlights the need for validated, calibrated BP measurement – whether in the office, at home, or using ambulatory monitoring – and emphasises confirming office BP values on repeated occasions whenever they form the basis for diagnosis. Team-based care, including structured collaboration with nurses and pharmacists, can improve BP assessment, support lifestyle and pharmacological adherence, and enhance BP control within the recommended 3-month period. Opportunistic screening, especially in adults aged ≥40 years and individuals at increased CV risk, further contributes to earlier detection and improved hypertension management. By promoting alignment between international evidence and daily clinical practice, this consensus document seeks to reduce variations in management, strengthen implementation of guideline-based care, and ultimately improve CV outcomes for patients living with hypertension.

Note

1. Developed in Collaboration with and endorsed by American Academy of Physician Associates; American Association of Nurse Practitioners; American College of Clinical Pharmacy; American College of Preventive Medicine; American Geriatrics Society; American Medical Association; American Society of Preventive Cardiology; Association of Black Cardiologists; National Medical Association; Preventive Cardiovascular Nurses Association; and the Society of General Internal Medicine.

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