



ARTERIAL HYPERTENSION: MODERN CLASSIFICATION AND TREATMENT APPROACHES

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ABSTRACT

Arterial hypertension (AH) represents one of the most prevalent and dangerous chronic conditions in modern medicine, combining empirical observations, advanced pharmacological knowledge, and lifestyle influences. It significantly contributes to cardiovascular diseases, stroke, renal failure, and other complications. Recent international guidelines, including the 2024 ESC and 2025 AHA/ACC, have updated classification systems and treatment strategies based on robust clinical evidence. This article examines the modern classification of arterial hypertension, diagnostic practices, therapeutic approaches, and guideline-based management. Through an interdisciplinary analysis integrating cardiology, epidemiology, and evidence-based medicine, this study demonstrates that current hypertension practices provide essential foundations for future cardiovascular prevention and care. Understanding these modern approaches offers valuable insights into risk reduction, preventive strategies, and the holistic view of health that continues to shape contemporary cardiology.

Keywords: Arterial Hypertension, Modern Classification, Treatment Approaches, Clinical Guidelines, Epidemiological Evidence

INTRODUCTION

Arterial hypertension is widely recognized as one of the leading modifiable risk factors for cardiovascular morbidity and mortality worldwide. Over recent decades, hypertension management has profoundly influenced global health policies and clinical practice. While extensive research has focused on cardiovascular interventions, pharmacology, and risk stratification, classification and treatment approaches continue to evolve with new evidence. Hypertension is highly prevalent due to dietary factors (high sodium intake), sedentary lifestyle, obesity, aging, and genetic predispositions, leading to sustained blood pressure elevation, target organ damage, and complications across diverse populations. These widespread conditions necessitate updated classification systems and evidence-based therapeutic strategies within comprehensive cardiovascular frameworks. The purpose of this article is to examine the modern classification and treatment of arterial hypertension by analyzing current epidemiological data and major international guidelines. The study aims to demonstrate that hypertension management is not an isolated practice but an integral component of healthcare, closely connected to medical theory, preventive strategies, and societal organization.

LITERATURE REVIEW

Scholarly interest in arterial hypertension classification and treatment has intensified since the mid-20th century, driven by large-scale epidemiological studies, randomized controlled trials (RCTs), and successive guideline developments. Early awareness of sustained blood pressure elevations dates back to antiquity, with references in ancient Chinese texts (Yellow Emperor's Classic of Internal Medicine, circa 2600 BC) linking salt intake to vascular issues. Modern quantitative understanding emerged in the late 19th century with Frederick Mahomed's description of "essential hypertension" (high pressure without proteinuria) and the invention of the sphygmomanometer by Scipione Riva-Rocci (1896) and Korotkoff sounds (1905), enabling reliable systolic and diastolic measurements.

The evolution of formal guidelines began in the 1970s with the U.S. Joint National Committee (JNC) reports, starting with JNC I (1977), which focused primarily on diastolic thresholds. Over the



decades, classifications shifted from dichotomous views to risk-stratified models. JNC 7 (2003) introduced “prehypertension” (120–139/80–89 mmHg), while JNC 8 (2014) raised treatment thresholds in older adults. The landmark 2017 ACC/AHA guideline redefined hypertension at $\geq 130/80$ mmHg, incorporating the Pooled Cohort Equations for 10-year ASCVD risk and emphasizing earlier intervention in stage 1 hypertension for high-risk patients.

European guidelines followed a parallel but distinct path. The 2003/2007/2018 ESC/ESH classifications retained optimal/normal/high-normal categories and graded hypertension (grades 1–3), with treatment initiation often at $\geq 140/90$ mmHg but earlier in high-risk groups. The 2023 ESH guidelines maintained this graded approach, while the 2024 ESC guidelines introduced a simplified, treatment-oriented categorization: non-elevated BP ($< 120/70$ mmHg, no drugs), elevated BP (120–139/70–89 mmHg, drugs based on CVD risk and follow-up), and hypertension ($\geq 140/90$ mmHg, prompt treatment). This shift prioritizes out-of-office measurements (ABPM/HBPM) for diagnosis and sets intensive systolic targets (120–129 mmHg) for most patients, with relaxed targets in frail/elderly individuals.

The 2025 AHA/ACC multisociety guideline replaces the 2017 version, adopting the PREVENT equations (replacing Pooled Cohort) for broader 10-year total CVD risk assessment (including heart failure), eliminating race-based criteria, and expanding pharmacotherapy in lower-risk stage 1 hypertension after 3–6 months of lifestyle failure if BP remains $\geq 130/80$ mmHg. It reaffirms $< 130/80$ mmHg as the universal target ($< 120/80$ mmHg preferred where feasible), strengthens lifestyle emphasis (e.g., sodium reduction, potassium increase, tailored exercise), and highlights team-based care, single-pill combinations, and renal denervation for resistant cases.

Epidemiological studies consistently report high global prevalence (affecting $\sim 1/3$ of adults), with organ damage and increased events. Meta-analyses and RCTs (e.g., SPRINT trial supporting intensive targets) underscore severity and intervention benefits, though debates persist on thresholds in low-risk groups, cognitive risks from over-lowering, and implementation barriers. Recent reviews highlight guideline convergence on risk-based, early combo therapy (ACEI/ARB + CCB or diuretic) and divergence in classification simplicity (ESC) vs. staged grading (AHA/ACC). This part supports hypertension’s central role in cardiovascular practice, with ongoing evolution toward personalized, preventive, and equitable management.

METHODOLOGY

This study employs a qualitative review-based methodology drawing on secondary sources. Data were collected from peer-reviewed journal articles, major guideline documents (2024 ESC and 2025 AHA/ACC), clinical trial reports, and monographs on cardiovascular medicine.

The methodological approach includes:

- Textual analysis of guidelines referencing hypertension classification and treatments
- Epidemiological analysis reported in literature to identify prevalence and risks
- Comparative analysis between 2024 ESC and 2025 AHA/ACC guidelines

An interdisciplinary framework combining cardiology, epidemiology, and evidence-based medicine was used to interpret findings within clinical and societal contexts. Emphasis was placed on understanding hypertension practices as part of a holistic cardiovascular system rather than isolated procedures.

RESULTS

Prevalence of Arterial Hypertension. Epidemiological evidence demonstrates that arterial hypertension is widespread globally. It affects nearly one-third of adults, driven by high-sodium diets, obesity, physical inactivity, and aging. This frequently leads to target organ damage (left ventricular



hypertrophy, retinopathy, nephropathy), chronic kidney disease, and cardiovascular events such as myocardial infarction and stroke.

Hypertension is highly prevalent across all social strata, indicating a major systemic public health issue with significant economic and societal impact.

Classification and Diagnostic Practices. Recent guidelines provide updated classifications for blood pressure.

2024 ESC Classification (simplified three-category system):

- Non-elevated BP: Office BP <120/70 mmHg — no drug treatment recommended.
- Elevated BP: Office SBP 120–139 mmHg or DBP 70–89 mmHg — drug treatment considered based on cardiovascular risk and follow-up levels.
- Hypertension: Office BP \geq 140/90 mmHg — prompt confirmation and drug treatment recommended in most cases.

2025 AHA/ACC Classification:

- Normal: <120/<80 mmHg
- Elevated: 120–129/<80 mmHg
- Stage 1 Hypertension: 130–139/80–89 mmHg
- Stage 2 Hypertension: \geq 140/ \geq 90 mmHg

Diagnosis prioritizes out-of-office measurements (home BP monitoring or ambulatory BP monitoring) for accuracy. Practitioners emphasize confirmation, risk assessment (using tools like PREVENT equations in AHA/ACC), and evaluation of target organ damage.

Hypertension and Medical Theory. Modern hypertension management relies on empirical evidence, risk-based models, and pathophysiological understanding. Elevated pressure is attributed to vascular dysfunction, endothelial impairment, genetic factors, and environmental influences. Treatment combines non-pharmacological (lifestyle) and pharmacological interventions.

This holistic approach reflects the interconnectedness of cardiovascular, renal, and metabolic systems. Blood pressure control is viewed as integral to overall cardiovascular health, aligning with preventive cardiology principles.

Professional Roles and Specialization. Guidelines recognize the role of hypertension specialists and multidisciplinary teams (including cardiologists, primary care physicians, nurses, and pharmacists). Titles such as "hypertension specialist" support recognized expertise within cardiology. Integration into team-based care underscores institutional importance. Evidence-based knowledge reinforces the legitimacy of hypertension treatments and promotes patient-centered management. Multidisciplinary approaches facilitate accurate diagnosis, adherence monitoring, and management of comorbidities, improving outcomes in complex cases like resistant hypertension.

DISCUSSION

The findings demonstrate that modern classification and treatment of arterial hypertension play a meaningful role in contemporary medicine, addressing widespread risks through evidence-based, risk-stratified strategies. While earlier guidelines had higher thresholds, current approaches show ingenuity in early intervention and prevention. The 2024 ESC's simplified classification (non-elevated, elevated, hypertension) and intensive systolic target of 120–129 mmHg represent a paradigm shift from prior European versions, aligning more closely with continuous risk models and emphasizing out-of-office measurements to capture real-world BP. This "opt-out" intensive approach (starting aggressive and relaxing if not tolerated) aims to identify at-risk individuals earlier via the new "elevated BP" category, potentially reducing CV events but raising concerns about overtreatment in lower-risk patients or implementation challenges in resource-limited settings.



In contrast, the 2025 AHA/ACC retains staged grading but broadens treatment eligibility in stage 1 hypertension using PREVENT equations (replacing Pooled Cohort), lowering risk thresholds to $\geq 7.5\%$ and expanding pharmacotherapy after lifestyle trials in select groups (e.g., diabetes, CKD). This promotes earlier intervention and targets $<130/80$ mmHg universally (preferring $<120/80$ mmHg where feasible), supported by evidence linking lower BP to reduced dementia risk and better outcomes. However, debates persist on potential over-medicalization in low-risk groups, cognitive/orthostatic risks from intensive lowering, adherence barriers, and socioeconomic disparities in guideline application.

Emphasis on targets (e.g., 120–129 mmHg systolic in ESC; $<130/80$ mmHg universal in AHA/ACC) reflects core principles of cardiology, with convergence on single-pill combinations, lifestyle as cornerstone (sodium reduction, exercise, potassium-rich diets), and team-based care. Integration into broader frameworks highlights the cultural and societal dimensions of healthcare, including equity and global applicability.

Comparatively, modern practices are more advanced in pharmacological combinations (single-pill preferred), monitoring, and risk tools compared to prior eras. These contributions influence ongoing traditions and represent a key chapter in cardiovascular history, though ongoing research is needed on long-term intensive targets, personalized therapy, and barriers in low- and middle-income countries.

CONCLUSION

Arterial hypertension management is a vital component of modern healthcare systems. Guideline-based and epidemiological evidence reveals recognition of its significance and the development of sophisticated strategies within current scientific constraints.

This study underscores the importance of contemporary contributions to hypertension evolution. By examining these practices, cardiovascular professionals can gain valuable perspective on enduring challenges of blood pressure control and the foundational principles of holistic, preventive care.

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