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APPROACHES TO EARLY DETECTION OF ARTERIAL HYPERTENSION

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ABSTRACT: Arterial hypertension is a leading modifiable contributor to cardiovascular morbidity and premature mortality. Because elevated blood pressure is frequently asymptomatic, early detection depends on systematic measurement rather than symptom-based consultation. This narrative review examines standardized office measurement, home blood pressure monitoring, ambulatory monitoring, and risk-based screening in adult populations. International recommendations from the World Health Organization, European Society of Cardiology, and United States Preventive Services Task Force were compared. The reviewed guidance supports repeated, properly performed measurements and, where feasible, out-of-office confirmation to distinguish sustained hypertension from white-coat and masked phenotypes. Screening is particularly relevant for adults with obesity, diabetes, kidney disease, cardiovascular disease, or a family history of hypertension. Integration of validated devices, staff training, clear referral pathways, and patient education may improve early recognition in primary care. No original patient observations or experimental results are claimed. Early detection should be combined with cardiovascular risk evaluation and timely follow-up to reduce preventable complications.

Keywords: arterial hypertension; early diagnosis; screening; home blood pressure monitoring; ambulatory monitoring; cardiovascular risk; primary care.

INTRODUCTION

Arterial hypertension remains one of the most important preventable risk factors for stroke, myocardial infarction, heart failure and chronic kidney disease. The World Health Organization estimated that 1.4 billion adults aged 30–79 years had hypertension in 2024, and approximately 600 million were unaware of their condition [1]. This diagnostic gap makes opportunistic blood pressure measurement during routine healthcare visits a practical public-health priority.

The absence of headache, dizziness or other symptoms cannot exclude hypertension. Blood pressure varies across the day and may rise transiently because of exertion, anxiety, pain or an incorrectly performed measurement. A single high reading should therefore trigger a structured assessment, not an automatic assumption of chronic disease. Conversely, a normal clinic reading does not necessarily exclude elevated pressure during ordinary activities or sleep [2].

Recent European guidance differentiates elevated blood pressure from hypertension and places greater emphasis on confirmation outside the clinic [2]. The present article aims to summarize evidence-based methods for identifying arterial hypertension at an early stage, to compare available

measurement approaches and to outline a practical diagnostic pathway for primary healthcare settings.

2. MATERIALS AND METHODS

A narrative literature review was undertaken using authoritative guidance and peer-reviewed publications on adult hypertension screening, diagnosis and cardiovascular risk assessment. Principal sources included the WHO hypertension fact sheet (2025), the 2024 European Society of Cardiology (ESC) guideline, the 2023 European Society of Hypertension (ESH) guideline, and the US Preventive Services Task Force (USPSTF) recommendation [1–4]. Supporting publications addressed global blood pressure trends, measurement methodology and home monitoring [5–8].

Sources were evaluated for the clinical setting, measurement protocol, diagnostic thresholds, confirmation methods and implications for early detection. The synthesis focuses on nonpregnant adults; pediatric and pregnancy-related hypertension require distinct assessment protocols. This is not a systematic review or meta-analysis. No patients were recruited, no clinical intervention was performed and no new prevalence or effectiveness estimates were calculated.

3. RESULTS: SYNTHESIS OF THE EVIDENCE

3.1. Standardized office blood pressure measurement. Office measurement is the most accessible initial screening method. Accurate assessment requires a validated device and correctly sized cuff, a quiet environment, at least five minutes of seated rest, supported back and arm, uncrossed legs, and avoidance of recent exercise, smoking or caffeine. Repeated readings reduce random variation. At the initial assessment, measurement in both arms helps identify clinically relevant inter-arm differences [2,3,7].

The 2024 ESC guideline retains a standardized office threshold of systolic blood pressure ≥140 mmHg and/or diastolic blood pressure ≥90 mmHg for hypertension. It also introduces an elevated blood pressure category, beginning at systolic 120 mmHg or diastolic 70 mmHg and extending below the hypertension threshold [2]. Classification must be interpreted within the chosen guideline framework, as international guidelines do not all use identical diagnostic cutoffs.

3.2. Home blood pressure monitoring. Home monitoring captures blood pressure in a familiar environment and can support confirmation of a suspected diagnosis. A validated upper-arm device is preferred. ESC guidance recommends two measurements, one to two minutes apart, in the morning and evening over at least three days and preferably up to seven days, with the readings averaged [2]. Under the ESC framework, mean home blood pressure ≥135/85 mmHg is consistent with hypertension. Patients require instruction in technique and should record readings rather than selectively reporting high values.

3.3. Ambulatory blood pressure monitoring. Twenty-four-hour ambulatory blood pressure monitoring (ABPM) automatically samples blood pressure during daily activities and sleep. It can identify nocturnal hypertension, masked hypertension and white-coat hypertension. Under ESC 2024 criteria, mean daytime ABPM ≥135/85 mmHg or mean 24-hour ABPM ≥130/80 mmHg

supports hypertension [2]. ABPM offers extensive diagnostic information but its availability, cost and patient tolerability may limit universal use.

3.4. Diagnostic phenotypes. White-coat hypertension refers to elevated clinic blood pressure with nonhypertensive out-of-office readings. Masked hypertension refers to nonhypertensive clinic readings with hypertensive values at home or on ABPM. Both phenotypes demonstrate why one clinical encounter cannot characterize every patient accurately. Masked hypertension deserves consideration when risk factors or target-organ findings are inconsistent with reassuring office readings [2,3].

3.5. Screening and cardiovascular risk. The USPSTF recommends blood pressure screening for adults aged 18 years or older and out-of-office confirmation before initiating treatment [4]. Adults with obesity, diabetes, chronic kidney disease, established cardiovascular disease, high dietary sodium intake or a family history of hypertension may warrant particular attention. Assessment should also consider tobacco use, physical activity, alcohol consumption and medications that can raise blood pressure [2–4].

Table 1. Selected diagnostic thresholds in the 2024 ESC guideline

Measurement setting	Hypertension threshold (mmHg)
Standardized office BP	≥140 systolic and/or ≥90 diastolic
Average home BP	≥135 systolic and/or ≥85 diastolic
Daytime ABPM	≥135 systolic and/or ≥85 diastolic
24-hour ABPM	≥130 systolic and/or ≥80 diastolic

Source: 2024 ESC guideline [2]. BP = blood pressure; ABPM = ambulatory blood pressure monitoring.

4. DISCUSSION

Early detection should be organized as a sequence: identify eligible adults, measure pressure accurately, repeat abnormal measurements, confirm the diagnosis when feasible and evaluate the overall cardiovascular risk. This sequence avoids two important errors: labeling transient clinic elevation as sustained hypertension and missing masked hypertension when a clinic reading appears acceptable. Screening alone has limited value unless an abnormal result leads to follow-up and appropriate care.

Primary healthcare teams can incorporate blood pressure checks into consultations for diabetes, obesity, kidney disease and preventive visits. Staff training should cover cuff selection, patient positioning, device validation and documentation. Patients may benefit from written home-monitoring instructions and scheduled reassessment. Digital records can assist in tracking repeated readings, although data quality and equitable access to devices remain important considerations.

When high blood pressure is detected, clinical evaluation should assess possible target-organ injury and secondary causes when indicated. History, examination and selected laboratory testing may include renal function, electrolytes, glucose or HbA1c, lipids, urinalysis and electrocardiography according to the clinical context [2,3]. These investigations complement, rather than replace, correct blood pressure measurement.

Markedly elevated readings require a different response from routine screening. The ESC recommends assessment for hypertensive emergency at blood pressure ≥180/110 mmHg; acute target-organ damage or concerning symptoms warrant urgent evaluation [2]. Severe readings should not be managed solely through delayed home monitoring. Pregnancy also requires specific diagnostic pathways outside the scope of this review.

In resource-constrained settings, properly standardized office measurement followed by repeat clinic visits may be the most feasible approach, while home monitoring and ABPM can be prioritized when uncertainty persists. Local implementation research is needed to determine the affordability, patient acceptability and diagnostic yield of these approaches in different populations, including healthcare facilities in Uzbekistan. The reviewed evidence does not establish the prevalence of undiagnosed hypertension in Termez or demonstrate outcomes from a local intervention.

5. CONCLUSION

Early detection of arterial hypertension depends on routine adult screening, standardized blood pressure measurement and reliable diagnostic confirmation. Home and ambulatory monitoring improve the recognition of sustained, masked and white-coat hypertension and provide clinically relevant information unavailable from a single clinic reading. Risk-based follow-up, assessment of comorbidities and clear referral systems are essential components of an effective diagnostic strategy. Strengthening these practices in primary healthcare can support timely prevention and management of cardiovascular complications. Future local studies should prospectively evaluate screening coverage, diagnostic confirmation and follow-up outcomes.

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