Hypertension in Adults

What We Know

The incidence of hypertension (HTN) increases with age, but onset is most common in adults who are 20–50 years of age. Approximately 20% of adults worldwide have HTN, including 75 million adults in the United States. HTN is classified as essential (also known as primary) when there is no known cause and as secondary when HTN is due to an identifiable cause.

- Risk factors for essential HTN, which accounts for 90–95% of cases of HTN in adults, include increased sodium intake, insulin resistance, hyperinsulinemia, obesity, diabetes mellitus, type 2 (DM2), hyperlipidemia, alcohol intake, positive family history, and intrauterine growth restriction.

- Causes of secondary HTN include renal disease (e.g., renal parenchymal scarring); pheochromocytoma; vascular disease (e.g., renal artery stenosis, coarctation of the aorta); obstructive sleep apnea; endocrine disease (e.g., Cushing syndrome, thyroid disease); use of certain prescribed medications (e.g., steroids, oral contraceptives), over-the-counter medications (e.g., decongestants), illicit drugs (e.g., cocaine), and smoking tobacco.

- Hypertensive disorders, including gestational HTN, pre-eclampsia, and eclampsia, are the most common complications in pregnancy. (For information, see Quick Lesson About ... Hypertension in Pregnancy: an Overview)

- HTN greatly increases the risk of macrovascular complications (e.g., stroke, myocardial infarction, cardiovascular disease) and microvascular complications (e.g., retinopathy, nephropathy, neuropathy).

- HTN is defined in the United States as elevated systolic blood pressure (SBP) ≥ 140 mm Hg or diastolic blood pressure (DBP) ≥ 90 mm Hg across three or more serial readings. Although adults with SBP measuring 120–139 mm Hg or DBP measuring 80–89 mm Hg are considered to be prehypertensive, they may still be at risk for complications associated with elevated BP.

- HTN is often classified as stage 1 when SBP is 140–159 mm Hg and DBP is 90–99 mm Hg and as stage 2 when SBP is ≥ 160 mm Hg and DBP is ≥ 100 mm Hg. The risk of cardiovascular events increases with the severity of HTN.

- Evaluation of patients with HTN includes BP assessment using a standard sphygmomanometer and stethoscope and performing laboratory and diagnostic tests such as CBC; fasting glucose; lipid panel; urine tests; serum levels of creatinine, potassium, and calcium; glomerular filtration rate; echocardiogram or EKG; and renal ultrasound.

- Home measurement of BP (HMBP) and ambulatory blood pressure monitoring (ABPM) may help to provide a more realistic assessment of a patient’s BP because these measurements are performed outside of the healthcare setting. HMBP or ABPM should be considered for patients with DM2, chronic kidney disease (CKD), suspected nonadherence to therapy, a demonstrated white coat effect (i.e. higher BP readings in the outpatient clinic setting related to increased stress in the healthcare setting), and individuals in whom BP is controlled in the clinic but uncontrolled at home. The procedure for measuring BP should be clearly explained and demonstrated to the patient.
and the patient should be asked to perform a return demonstration of the procedure during supervision until he/she is comfortable performing BP measurement correctly. For HMBP and ABPM the definition of HTN is slightly different, and HTN is diagnosed when SBP is > 135 mm Hg while awake (> 120 mm Hg while sleeping) and/or DBP is > 85 mm Hg while awake (> 70 mm Hg while sleeping)(2,5,6)

– The use of telemonitoring, in which BP readings are transmitted electronically and automatically to a clinician in real time, has been shown to be an effective adjunct to HMBP and ABPM, although it is not known if telemonitoring is beneficial in the long term or if it is cost effective(9)

Treatment for HTN includes patient education regarding making lifestyle changes and the use of antihypertensive medications to lower BP and reduce cardiovascular risk. For adults with prehypertension, lifestyle changes are recommended as an initial treatment strategy(1,2,4,5,6,7,8,11)

• Lifestyle changes that can improve HTN include weight reduction, regular physical activity, dietary modifications (e.g., following the Dietary Approaches to Stop Hypertension [DASH] diet, which is low in sodium and high in fruits, vegetables, and low-fat dairy products), limiting alcohol consumption, and smoking cessation(4,5,6,8)

– Authors of a systematic review concluded that regular physical activity reduces mortality risk in patients with HTN; reported reductions in cardiovascular mortality were 16–67%(11)

– Aerobic exercise is currently considered the preferred exercise modality for BP reduction. However, investigators who conducted a systematic review and meta-analysis determined that isometric resistance training results in BP reductions that are greater than those previously reported in aerobic exercise training(3)

• BP targets and thresholds for initiation of pharmacologic treatment vary among the many guidelines for the management of HTN(1,2,4,5,6,7,8)

– The Eighth Joint National Committee (JNC 8) guidelines, which were released in 2014 and set less strict treatment-initiation thresholds and BP goals than were included in the JNC 7 guidelines, recommend the following(2):
  - Patients who are > 60 years of age: initiate treatment in patients with BP > 150/90 mm Hg and treat to achieve a BP that is below these thresholds
  - The panel cites a lack of evidence that treating older patients to lower BP goals improves clinical outcomes
  - Patients who are < 60 years of age, including those with CKD or DM: initiate treatment in patients with BP > 140/90 mm Hg and treat to below these thresholds

– Guidelines developed jointly by the European Society of Hypertension (ESH) and the European Society of Cardiology (ESC) recommend treating all patients—with the exception of patients with DM or patients who are older than 80 years of age—to a systolic BP < 140 mm Hg(6)

  - The ESH/ESC guidelines recommend treatment of patients with DM to < 85 mm Hg diastolic BP and patients older than 80 years of age to 140–150 mm Hg systolic BP

  – The American Diabetes Association recommends treatment of patients with HTN and DM to a BP goal of < 140/80 mm Hg, with a lower systolic BP goal (e.g., < 130 mm Hg) appropriate in certain individuals such as younger patients(1)

  – The Canadian Hypertension Education Program recommends treatment of patients with HTN, including those with nondiabetic-related CKD, to achieve a BP level < 140/90 mm Hg. For patients with DM, the group recommends treatment to a systolic BP < 130 mm Hg(5)

Pharmacologic treatment is essential for most individuals with HTN in order to lower cardiovascular risk(1,2,4,5,6,7,8)

• The JNC 8 guidelines make the following recommendations regarding antihypertensive agent choice(2):
  – For non-Black patients with HTN: Initiate therapy with a thiazide diuretic, angiotensin-converting enzyme (ACE) inhibitor, angiotensin-receptor blocker (ARB), or calcium channel blocker (CCB)
  – For Black patients with HTN: Initiate therapy with a thiazide diuretic or CCB
  – For patients with CKD: Initial or add-on therapy should include an ACE inhibitor or ARB, but ACE inhibitor/ARB combination therapy should be avoided in all patients
    - Dual renin-angiotensin system blockade (i.e., the use combined use of an ACE inhibitor, ARB, direct renin inhibitor) can cause hyperkalemia, hypotension, and kidney failure(8)

• Although effective treatment for HTN can be achieved in some cases using one pharmacologic agent, it is more common that two or more agents are required to reach BP targets. For this reason, two drugs may be prescribed as initial treatment, particularly in patients with stage 2 HTN(2,4,5,6,7,8)
• A small reduction in BP leads to a significant reduction in risk of complications; reducing SBP by 2 mm Hg reduces risk for stroke by 15%, and reduces risk for coronary artery disease by 6% in a given population.\(^8\)

  – Adequate control of BP reduces risk of cardiovascular-related mortality by 20% and cerebrovascular-related mortality by 24%.\(^{10}\)

  › Despite advances in the treatment of HTN, suboptimal BP control is common and increases the risk of HTN-related complications; 50–80% of patients with HTN do not take their medications as prescribed, and the poorer the adherence to the prescribed treatment regimen, the greater the risk for adverse events.\(^2,4,10\)

  • Therapeutic inertia (i.e., when a healthcare provider does not increase prescribed therapy despite patient failure to achieve treatment goals), poor patient adherence to dietary and medical therapy, and undiagnosed causes of secondary HTN are among the factors leading to suboptimal BP control.\(^3,8,10\)

  – Combination therapy (e.g., prescribing an ACE inhibitor in combination with a thiazide diuretic or an ARB in combination with a CCB) using a formulation of two agents in a single pill has been shown to improve long-term patient compliance with antihypertensive therapy.\(^8\)

### What We Can Do

› Learn more about HTN in adults so you can accurately assess your patients’ personal characteristics and health education needs; share this knowledge with your colleagues

› Evaluate your patients’ risk factors for HTN, including older age (e.g., older than 65 years of age), DM, high cholesterol, obesity, physical inactivity, smoking tobacco, and family history of HTN

› To effectively identify patients with HTN, employ accurate technique when assessing BP, and educate patients regarding proper technique for HMBP, if appropriate. (For information, see Nursing Practice and Skill … Blood Pressure Reading, Indirect: Taking -- Adult Patient

• Be aware that severe, symptomatic HTN (e.g., BP > 180/120 mm Hg) represents a medical emergency that typically requires urgent treatment with intravenous antihypertensive medications in order to reduce the risk of cardiovascular events

› Advise patients with prehypertension that the condition may be a risk factor for complications associated with elevated BP

› Encourage all patients to initiate and maintain healthy lifestyle modifications, including losing weight if appropriate, participating in physical exercise several times a week, modifying their diet (e.g., reduce sodium intake and eat more fruits and vegetables), limiting consumption of alcohol, and quitting smoking

• Teach patients to read food labels so that they can avoid foods high in sodium, fat, and sugar

• Request referral, if appropriate, to a registered dietitian for additional patient education regarding nutrition and healthy food consumption

› Educate patients with HTN regarding the need to adhere to the prescribed treatment regimen. Inform patients that receiving two or more medications is commonly necessary to gain adequate BP control

### References


