Hypertension: ACC/AHA Guideline for the Prevention, Detection, Evaluation, and Management of High Blood Pressure in Adults (2017)

About the Guideline

- The committee writing this guideline included clinicians, epidemiologists, cardiologists, a physician assistant, a pharmacist, a nurse, a nephrologist, internists, an endocrinologist, a neurologist, a geriatrician, and two lay/patient representatives.
- Organizations that have representation include the American Heart Association (AHA), American College of Cardiology (ACC), Association of Black Cardiologists (ABC), American College of Preventive Medicine (ACPM), American Academy of Physician Assistants (AAPA), American Pharmacists Association (APhA), National Medical Association (NMA), Preventive Cardiovascular Nurses Association (PCNA), American Society for Preventive Cardiology (ASPC), American Geriatrics Society (AGS), and the American Society of Hypertension (ASH).
- Reviewed by 2 official reviewers from the AHA and ACC, and one reviewer from each of the following: PCNA, AAPA, NMA, ABC, AGS, ACPM, ASH, ASPC, and APhA, as well as 38 individual content reviewers.
- Blood pressure (BP) is categorized into normal, elevated, stage 1, and stage 2 levels, with prevention and treatment guidelines specified for each level.

Key Clinical Considerations

Become familiar with the recommendations and best-practice statements provided in this guideline, especially if you work in an acute care setting.

Epidemiology

- The prevalence of hypertension in the United States is 46% in the general population.
- Hypertension (HTN) becomes more common as age increases, and it is more common among non-Hispanic blacks than among other races or ethnicities.

Adult blood pressure categories and interventions

- Normal: Systolic blood pressure (SBP) less than 120 mmHg and diastolic blood pressure (DBP) less than 80 mmHg. Optimize lifestyle habits and reassess in one year.
- Elevated: SBP 120-129 mmHg and DBP less than 80 mmHg. Pursue nonpharmacological therapy and reassess in 3 to 6 months.
- HTN stage 1: SBP130-139 mmHg or DBP 80-89 mmHg.
    - If the 10-year cardiovascular disease (CVD) risk is less than 10%, pursue nonpharmacological therapy and reassess in 3 to 6 months.
    - If CVD risk is greater than 10%, pursue nonpharmacological therapy together with BP-lowering medications, reassess in one month, and optimize therapy if not at target.
- HTN stage 2: SBP is greater than or equal to 140 mmHg or DBP is greater than or equal to 90 mmHg. Pursue nonpharmacologic therapy together with BP-lowering medications. Repeat blood pressure evaluation in 1 month.

Causes of HTN

- Genetic factors: 3.5% of BP variability is related to a specific gene location.
- Environmental factors: being overweight, excess sodium intake, nutrient-poor diet, inactivity, excess alcohol intake.
- Childhood risk factors: Childhood obesity, premature birth, and low birth weight.
- Secondary causes: can be identified and treated, such as primary aldosteronism, renal artery stenosis, and obstructive sleep apnea (OSA). Referral to a specialist for any of these findings is recommended.
- Substance abuse: prescription medications, illegal drugs, over-the-counter (OTC) medications, food substances, and herbal supplements.

Clinical evaluation

- Accurate blood pressure measurement.
    - In patients under 30 years old with elevated brachial blood pressure, obtain a thigh blood pressure.
- Labs: fasting blood glucose level, complete blood count (CBC), lipids, serum creatinine, glomerular filtration rate (GFR), serum sodium, potassium, calcium, thyroid stimulating hormone (TSH), urinalysis, electrocardiogram (ECG).
- HTN can cause target organ damage that can occur in the brain, eyes, kidneys, and heart. Left ventricular hypertrophy (LVH) can be seen on an echocardiogram, MRI, and possibly on an ECG. Lowering blood pressure can reduce left ventricular mass.
- Identify secondary causes of HTN, which include:
    - Obstructive sleep apnea (OSA)
    - Renovascular disease
    - Alcohol or drugs
    - Renal parenchymal disease
    - Primary aldosteronism, or other mineralocorticoid excess syndromes
    - Hypothyroidism, hyperthyroidism, or primary hyperparathyroidism
    - Cushing syndrome
    - Aortic coarctation
    - Pheochromocytoma
    - Congenital adrenal hyperplasia
    - Acromegaly

Nonpharmacologic treatment

- Weight loss with a heart-healthy diet, such as the DASH diet (Dietary Approaches to Stop Hypertension)
- Sodium reduction by 25% and potassium supplementation
- Increased physical activity
- Reduction of alcohol consumption to less than two drinks per day for men, and one drink per day for women.

Pharmacological treatment

- Avoid the concomitant use of an angiotensin-converting enzyme inhibitor (ACEI), angiotensin II receptor blocker (ARB), and/or renin inhibitor.

- Initial pharmacological agents include thiazide diuretics, ARBs, calcium channel blockers (CCBs), and ACEIs. Consider a single agent for stage 1 HTN; a patient may need two drug classes for stage 2 HTN.
- Avoid prescribing two drugs from a single class. Exceptions can be made for diuretics (thiazides, potassium-sparing diuretics, and loop diuretics) and calcium channel blockers. (nondihydropyridine and dihydropyridine may be used together).
- The same drug treatments and goals can be used for patients with HTN and diabetes mellitus, although controlling BP in these patients can be more difficult.
- Use BP-lowering medication for secondary prevention in patients with cardiovascular disease (CVD) who have an average SBP greater than 130 mmHg or DBP greater than 80 mmHg or higher.
- Use BP-lowering medication for primary prevention of CVD in adults with no history of CVD, an estimated 10-year atherosclerotic cardiovascular disease (ASCVD) risk of less than 10%, and a SBP of 140 mmHg or higher or a DBP of 90 mmHg or higher.

HTN in stable ischemic heart disease

- Target BP should be less than 130/80 mmHg.
- First-line therapy: Guideline-directed medical therapy (GDMT) beta-blocker (BB), ACEI, or ARBs; add dihydropyridine CCBs, mineralocorticoid receptor antagonists, and thiazide diuretics as needed.
- Lowering of SBP to less than 130/80 reduces all-cause mortality by 27% and cardiovascular disease (CVD) complications by 25%.
- BBs reduce all-cause mortalities by 23% after MI.

HTN in patients with heart failure (HF)

- Target BP should be less than 130/80 mmHg.
- Heart failure with reduced ejection fraction (HFrEF) guideline-directed medical therapy (GDMT) should be titrated until BP is less than 130/80 mmHg.
- Avoid nondihydropyridine CCBs in HFrEF.
- In heart failure with preserved ejection fraction (HFpEF) with volume overload, give a diuretic for HTN, then add an ACEI/ARB and BB to obtain a SBP less than 130 mmHg.

HTN in patients with chronic kidney disease (CKD)

- Target BP should be less than 130/80 mmHg.
- CKD stage 3 or higher, or stage 1 or 2 with albuminuria greater than or equal to 300 mg/day, it is reasonable to use an ACEI. However, an ARB can be used if an ACEI is not tolerated.
- After renal transplant and based on kidney survival and improved glomerular filtration rate (GFR), treat patient with calcium channel antagonist; target BP should be less than 130/80 mmHg.

HTN in patients with cerebrovascular disease

- In cases of acute intracerebral hemorrhage (ICH), with a SBP greater than 220 mmHg, use a continuous IV drug infusion, along with close BP monitoring, to lower SBP.
- Patients with spontaneous ICH presenting less than 6 hours from onset of symptom or event, and with a SBP of 150-220 mmHg, should not have SBP lowered to less than 140 mmHg due to risk of harm, severe disability, or death.
- In patients with acute ischemic stroke:

  - If the patient is tissue plasminogen activator (TPA)-eligible, lower BP to less than 185/110 mmHg prior to TPA initiation and maintain BP less than 180/105 mmHg for 24 hours after therapy.
  - Start or restart BP meds when BP is greater than 140/90 mmHg, for neurologically stable patients.
  - If patient has prior HTN, restart antihypertensive medications a few days after the event and use a thiazide diuretic, ARB, ACEI, or a combination thereof. If patient has not been previously treated for HTN, start treatment a few days after the event, with a target BP of less than 130/80mmHg.

HTN in patients with peripheral artery disease (PAD)

- Risk of stroke and CVD is increased; HTN is a risk factor for PAD.
- Patients with HTN and PAD require the same treatment as those without PAD.

Atrial fibrillation with HTN

- Control of HTN is key in treating atrial fibrillation.
- Treating HTN with an ARB can prevent recurrence of atrial fibrillation.

HTN with valvular heart disease

- Aortic stenosis: treat with low-dose medication and titrate slowly; avoid rate-slowing medications in aortic insufficiency.
- Thoracic aortic disease: BB are the preferred therapy.

HTN in special groups

- Black adults: start initial treatment with a CCB or thiazide-type diuretic (if patient is without CKD or HF); often two or more medications will be needed.
- Adults over age 65, with limited life expectancy, and high comorbidity factors: consider the intensity of BP lowering and choice of antihypertensive medications.
  - Treatment of blood pressure in older adults remains a challenge, due to the high degree of diversity in comorbidities, polypharmacy, frailty, risk for falls, cognitive impairments, and variable life expectancy that come with advanced age.
- Surgical patients: continue BB and HTN treatment. Consider stopping ACEI or ARB if patient is to undergo major surgery. Consider deferring surgery if BP is greater than 180/100 mmHg.
  - HTN occurring during the perioperative phase of surgery should be treated with IV antihypertensives until the patient can resume oral intake.

Resistant HTN and HTN crisis

- Resistant hypertension is diagnosed when patients are on 3 or more antihypertensive medications (including a diuretic) and exhibit uncontrolled HTN. Interventions include excluding pseudoresistance, screening for secondary causes, avoiding interfering substances, reversing adverse lifestyle factors, and considering referral to a specialist.
- HTN crisis: BP greater than 180/120 mmHg with new or worsening target organ damage.
- Adults with no compelling condition: reduce SBP no more than 25% during first hour. Target BP should be 160/100 mmHg within 2 to 6 hrs. Goal is for BP to return to normal over next 24-48 hours.

- Adults with compelling condition: rule out pheochromocytoma or aortic dissection. Bring SBP to less than 140 mmHg during first hour or down to 120 mmHg if patient has aortic dissection. Admit patient to intensive care unit (ICU) for continuous monitoring.

Lifestyle modification

- Encourage smoking cessation, weight loss, healthy eating, limit alcohol intake, reduce sodium intake, and increase physical activity.
- Address social and cultural barriers that affect lifestyle changes to reduce HTN.
- Consider telemonitoring on discharge.
- Develop evidence-based plan of care for HTN treatment goals with a team approach.

Reference

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