



Prevention and Management of Hypertension

OBJECTIVE

The objective of this Clinical Practice Guideline (CPG) is to provide evidence-based practice recommendations for the treatment of Hypertension. The CPG discusses Care Management goals and objectives (e.g., behavior modification, lifestyle changes) and behavioral health implications. The CPG outlines the organizations that WellCare aligns with regarding Hypertension and Measureable Health Outcomes.

OVERVIEW

Hypertension is the main independent risk factor for the development of cardiovascular disease and mortality worldwide. Without routine screening, many would never know they have high blood pressure, as there are often no symptoms, until they have a hypertensive crisis. By then, much damage to vessels and organs may have occurred. Managing the risk factors below of hypertension is crucial for minimizing the impact of the disease:^{1,2,3}

- **Modifiable.** Being overweight; high sodium intake; sedentary lifestyle; stress; drinking too much alcohol
- **Non-Modifiable.** Age, Race/Ethnicity, Gender, Family History

Complications arising from chronic high blood pressure include:³

- Aneurisms
- Chronic Kidney Disease
- Eye Damage
- Peripheral Artery Disease
- Heart Disease
- Heart Failure
- Heart Attack
- Cerebrovascular Disease and Stroke

For screening information related to hypertension, visit the United States Preventive Services Task Force (USPSTF) website at <https://www.uspreventiveservicestaskforce.org>. In addition, refer to the following preventive CPGs: *Adult Preventive Health: HS-1019*, *Pediatric Preventive Health: HS-1019*, *Adolescent Preventive Health: HS-1051*, and *Preventive Health for Older Adults: HS-1063*.

Hierarchy of Support

GUIDELINE HIERARCHY

CPGs are updated annually or as necessary due to updates made to guidelines or recommendations by the American Heart Association (AHA), the American Stroke Association (ASA), the Eighth Joint National Committee, and the American College of Cardiology (ACC). When there are differing opinions noted by national organizations, WellCare will default to the member's benefit structure as deemed by state contracts and Medicaid / Medicare regulations. If there is no specific language pertaining to Hypertension, WellCare will default (in order) to the following:

- National Committee for Quality Assurance (NCQA);
- United States Preventive Services Task Force (USPSTF), National Quality Strategy (NQS), Agency for Healthcare Research and Quality (AHRQ);
- Specialty associations, colleges, societies, etc. (e.g., American Academy of Family Physicians, American

Congress of Obstetricians and Gynecologists, American Cancer Society, etc.).

Links to websites within the CPGs are provided for the convenience of Providers. Listings do not imply endorsement by WellCare of the information contained on these websites. NOTE: All links are current and accessible at the time of MPC approval.

WellCare aligns with AHA, ASA, Eighth Joint National Committee, and the ACC on the topic of Hypertension. Highlights from their respective publications are noted below.

AMERICAN HEART ASSOCIATION / AMERICAN STROKE ASSOCIATION

The AHA/ASA updated their joint guideline on hypertension in adults in November 2017. Highlights include:

- **Change in Classification.** A BP reading of >130/80 mm Hg is considered hypertensive. Previously the reading was >140/90 mm Hg. Due to this change, the prevalence of hypertension is estimated to be 14% higher. Nonpharmacological management is recommended for the majority of adults who would be newly classified as having hypertension, with BP-lowering medication being recommended in addition to nonpharmacological therapy for only a small fraction of those newly diagnosed.
- **Secondary Forms of Hypertension.** Responsible for approximately 10% of patients with hypertension, secondary forms can be cured or require specific treatments. The AHA/ASA provides suggestions for clinical presentations that warrant screening for secondary forms of hypertension and guidance for conduct of specific screening tests.
- **Pharmacology.** The guideline updates nonpharmacological management as well as drug management, including a section on antihypertensive medications.
- **Management of Hypertension in Adults with Comorbidities and in Special Patient Groups.** Additional considerations are included (e.g., presence of resistant hypertension, hypertensive crisis/emergency).
- **Improving Treatment and Control in Adults with Hypertension**

The AHA/ASA full guideline report is available [here](#).¹⁰ An overview of the guideline is also available [here](#).¹¹

JOINT NATIONAL COMMITTEE⁴

In 2014, the Eighth Joint National Committee released recommendations on the management of high blood pressure. The report focused on evidence-based approaches to develop recommended treatment thresholds, goals, and medications in the management of hypertension in adults. The Committee's full report is available [here](#).⁴

AMERICAN COLLEGE OF CARDIOLOGY AND THE AMERICAN HEART ASSOCIATION⁹

The American College of Cardiology (ACC) and the American Heart Association (AHA) published a joint report in 2013 that focuses on the following:

- Atherosclerotic Cardiovascular Disease (ASCVD) Risk Reduction: 4 Statin Benefit Groups
- A New Perspective on LDL-C and/or Non-HDL-C Treatment Goals
- Global Risk Assessment for Primary Prevention
- Safety Recommendations
- Role of Biomarkers and Noninvasive Tests
- Future Updates to the Blood Cholesterol Guideline

The ACC and AHA have collaborated with the National Heart, Lung, and Blood Institute (NHLBI) as well as other key stakeholders and professional organizations in creating guidelines assessing cardiovascular risk. Components of the guidelines include: assessment of risk; lifestyle modifications to reduce risk; management of blood cholesterol; and obesity. The full report can be found [here](#).

INSTITUTE FOR CLINICAL SYSTEMS IMPROVEMENT

The Institute for Clinical Systems Improvement (ICSI) has endorsed with qualifications the *2014 Evidence-Based Guideline for the Management of High Blood Pressure in Adults Report* published the Eighth Joint National Committee. The full report can be found [here](#).⁶

Evidence Based Practice

MEASUREMENT OF COMPLIANCE

WellCare is committed to adhering to the measures and standards published by the Centers for Medicare and Medicaid Services (CMS) and the National Committee for Quality Assurance (NCQA). Please reference WellCare’s Clinical Policy Guiding Document titled *Measures of Compliance*.

NOTE: To access Clinical Policy Guiding Documents visit www.wellcare.com – select the Provider tab, then “Tools” and “Clinical Guidelines”.

Care Management

The goals for Care Management is to support the member’s ability to self-manage their disease, minimize risks factors, and remove barriers preventing the member from achieving those goals. Educate member on the primary hypertensive crisis symptoms to seek emergency medical care for:⁷

- | | |
|--|---|
| <ul style="list-style-type: none"> • Headache • Chest pain • Dizziness (vertigo) • Shortness of breath | <ul style="list-style-type: none"> • Nausea • Uncontrollable nose bleed • Extreme anxiety • Vision problems (like blurred vision) |
|--|---|

Integrated care management of hypertension involves:

- Coaching related to stress management skills;
- Ensuring adherence to medications, refilling timely;
- Therapeutic monitoring related to use of ACE, ARB, diuretic, and / or digoxin, annually at a minimum;
- Supporting the member’s tobacco cessation efforts; and
- Assessing for risk of depression and share with appropriate provider(s) if risks identified.

MEASURABLE HEALTH OUTCOMES

Targeted Health Outcomes (Extended Program Goals) result from successful member self-management (see Case Management Objectives).

1. Improved blood pressure, systolic (target <130) and / or diastolic (target <80). Compare blood pressure documented in provider records, assessments and care plan, and monitoring data sources pre- and post-engagement at 6-12 months. In absence of these data sources, CM may use Provider and/or Member narrative and/or HRA data may be used.
2. The member experiences weight loss by a specified number of pounds (or kg) over a specific period of time after the start of Case Management engagement. Compare average weight gains pre- and post-engagement. Case Management may use provider and/or member narrative for weights.
3. The member is free of hypertensive crisis over a specific period of time. Compare recent acute utilization frequency for hypertensive crisis to the frequency prior to CM engagement. Monitor for ED and inpatient authorization / utilization related to the primary diagnosis of hypertension. In absence of ED and inpatient utilization, authorizations and claims data, CM may use Provider and/or Member narrative to validate the member has not required acute medical intervention for hypertensive crisis.

CASE MANAGEMENT GOALS

Case Goals should target specific care gaps and/or adherence issues, and measure the member’s progress towards self-management and adherence which will lead to the targeted health outcomes above. Examples:

- Member’s prescription refills demonstrate at least an 80% adherence rate (verified by claims or member/provider narrative) for [beta-blocker, ACE inhibitor, ARB, digoxin, other] over last 30 days.
- Member describes a low-salt, low-fat, low-cholesterol diet and an exercise regime over the last 30 days that demonstrates improved adherence to guidelines and/or physician recommendations.
- Member describes a routine that includes checking and logging blood pressure per physician recommendation over the last 30 days and shares log with physician.
- Specific for Members requiring hospitalization: The Member participates in provider follow-up visit within 7 days of hospital discharge.

CASE MANAGEMENT OBJECTIVES

Case Management objectives should focus on improving the Member's self-management skills – objectives include:

- Increasing physical activity to at ≥ 150 minutes/week or as otherwise prescribed by the Provider.
- Following a low-sodium, low-fat, low-cholesterol diet.
- Maintaining a healthy body weight.
- Managing stress.
- Taking medications as prescribed.
- Adhering to provider visit(s) as scheduled.
- Checking blood pressure as directed by Provider.
- Keeping a log of pulse and blood pressure readings to share with Provider(s).
- Tobacco cessation.
- Avoiding second-hand smoke.
- Early identification of warning symptoms requiring a call to emergency services.
- Management of member's comorbidities that increase risk, such as diabetes and hyperlipidemia.

The care team should also ensure screening for and treating co-morbid anxiety and depression, as applicable.

MEDICAL BEHAVIORAL INTEGRATION

Several studies examining the association of hypertension with psychological distress, such as anxiety and depressive symptoms, have produced positive associations. Although there does exist some evidence to the contrary, the majority of results demonstrated that distressed participants were more likely to have low or highly elevated blood pressure. Per the ADA, "Being in a stressful situation can temporarily increase your blood pressure, but science has not proven that stress causes high blood pressure. Some scientists have noted a relationship between coronary heart disease risk and stress in a person's life, health behaviors and socioeconomic status. How you deal with stress may affect other, established risk factors for high blood pressure or heart disease. For example, people under stress may overeat or eat a less healthy diet, put off physical activity, drink, smoke or misuse drugs." Therefore it is recommended to care teams that they address the member's psychological factors, such as management of stress, anxiety, and depressive symptoms, in parallel with the treatment for hypertension. This can be of particular impact during initial notification to the member of the diagnosis of hypertension.^{8,9}

MEMBER EDUCATIONAL RESOURCES

WellCare contracts with Krames/StayWell for Member educational materials utilized by Case Managers. Items are available to review with Members to address knowledge gaps. Case Managers verbally educate Members on the topics below related to hypertension. (Titles may also be sent to the member).

NOTE: Links are internal for WellCare Care Management staff.

- [What Is High Blood Pressure](#)
- [Understanding Link Between High Blood Pressure and Stroke](#)
- [High Blood Pressure and Peripheral Arterial Disease \(PAD\)](#)
- [Controlling High Blood Pressure](#)
- [Identifying Your Heart Risks](#)
- [Taking Aspirin for Atherosclerosis - HTN](#)
- [Coping with Your Diagnosis - HTN](#)
- [Understanding Food and Cholesterol - HTN](#)
- [Eating Heart Healthy Food - the DASH Plan](#)
- [Eating Healthy - HTN](#)
- [Tips for Using Less Salt](#)
- [Low-Fat Cooking Tips - HTN](#)
- [Exercise Fitting It into Your Life - HTN](#)

Providers may wish to research the titles above related to hypertension that Case Managers utilize with Members.

PHARMACOLOGY

Pharmacologic treatment and indications for individual drug classes are outlined below:^{2,3}

- *Classes of Antihypertensive Drugs*
 - Diuretics
 - Alpha Blockers/Inhibitors
 - Angiotensin II Receptor Blockers (Use ACE Inhib)
 - Calcium Channel Blocking Agents

- Beta Blockers
- ACE Inhibitors
- Vasodilators
- *Monotherapy.* Start with one drug that is long acting, at a low dose, administered once daily (when feasible).
- *Alpha blockers* for symptomatic BPH.
- *Diuretics* preferred for isolated systolic hypertension (older person); long acting diphhydropyridine calcium antagonists.

Compelling Indication

Recommended Drugs

Heart Failure	Diuretic, BB, ACEI, ARB, Aldo ANT
Postmyocardial Infarction	BB, ACEI, Aldo ANT
High Coronary disease Risk	Diuretic, BB, ACEI, CCB
Diabetes	Diuretic, BB, ACEI, ARB, CCB
Chronic Kidney Disease	ACEI, ARB
Recurrent Stroke Prevention	Diuretic, ACEI

ACE = angiotensin converting enzyme inhibitor; ARB = angiotensin receptor blocker; BB = beta-blocker; CCB = calcium channel blocker

After drug therapy is initiated, patients should be monitored and medications should be adjusted accordingly:

- *Monthly:* Until BP goal is reached
- *Every 3-6 months:* After BP goal is reached and stable
- *Once or twice per year:* Serum potassium and creatinine level

The AHA/ASA recommends BP-lowering medication for those with stage 1 hypertension with clinical CVD or a 10-year risk of ASCVD 10% or greater, as well as for those with stage 2 hypertension. For stage 2, the recommendation is 2 BP-lowering medications in addition to healthy lifestyle changes, which is a more aggressive treatment standard—previous guidelines recommended starting patients on only 1 BP-lowering medication. For adults starting a new or adjusted drug regimen to treat hypertension, follow up with them each month to determine how well they are following and responding to their prescribed treatment until their BP is under control. For a full list of medications, see Table 18 in the 2017 AHA/ASA Guideline available [here](#).¹⁰

The guideline also notes information specific to Black adults who are more likely to have hypertension than other groups. For the population, 2 or more antihypertensive medications are recommended to achieve a target of less than 130/80 mm Hg. In addition, thiazide-type diuretics and/or calcium channel blockers are more effective in lowering BP alone or in multidrug regimens. Morbidity and mortality attributed to hypertension are more common in Black and Hispanic adults compared with White adults.¹⁰

Related WellCare Guidelines

In addition to the information contained in this document, please reference the following CPGs: *Cholesterol Management (HS-1005)*, *Congestive Heart Failure (HS-1003)*, and *Coronary Artery Disease (HS-1002)*.

NOTE: Clinical Policies can be accessed by going to www.wellcare.com – select the Provider tab, then “Tools” and “Clinical Guidelines”.

References

1. Risk factors for high blood pressure. National Heart, Lung, and Blood Institute Web site. <http://www.nhlbi.nih.gov/health/health-topics/topics/hbp/atrisk>. Published September 10, 2015. Accessed November 28, 2016.
2. Symptoms, diagnosis, and monitoring of high blood pressure. American Heart Association Web site. http://www.heart.org/HEARTORG/Conditions/HighBloodPressure/SymptomsDiagnosisMonitoringofHighBloodPressure/Symptoms-Diagnosis-Monitoring-of-High-Blood-Pressure_UCM_002053_Article.jsp. Published June 29, 2016. Accessed November 28, 2017.
3. What are the signs, symptoms, and complications of high blood pressure? National Heart, Lung, and Blood Institute Web site. <http://www.nhlbi.nih.gov/health/health-topics/topics/hbp/signs>. Published September 10, 2015. Accessed November 28, 2016.
4. James PA, Oparil S, Carter BL, Cushman WC, Dennison-Himmelfarb C, Handler J, et al. (2014). 2014 evidence-based guideline for the management of high blood pressure in adults: report from the panel members appointed to the Eighth Joint National Committee. *Journal of the American Medical Association*, 311(5), 507-520. Available at <http://jamanetwork.com/journals/jama/fullarticle/1791497>.
5. Stone NJ, Robinson J, Lichtenstein AH, Merz NB, Blum CB, Eckel RH, et al. 2013 ACC/AHA guideline on the treatment of blood cholesterol to reduce atherosclerotic cardiovascular risk in adults: a report of the American College of Cardiology / American Heart Association Task Force on the Practice Guidelines. <http://circ.ahajournals.org/content/circulationaha/early/2013/11/11/01.cir.0000437738.63853.7a.full.pdf>. Published 2013.

- Accessed November 9, 2016.
6. Kenning I, Kerandi H, Luehr D, Margolis K, O'Connor P, Pereira C, Schlichte A, Woolley T. Institute for Clinical Systems Improvement. Hypertension Diagnosis and Treatment. Updated November 2014. <https://www.icsi.org/asset/wjv4g/HTN.pdf>. Published November 2014. Accessed November 9, 2016.
 7. Salkic S, Batic-Mujanovic O, Ljuca F, Brkic S. (2014). Clinical presentation of hypertensive crises in emergency medical services. Mater Sociomed. 2014 Feb; 26(1): 12–16. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3990398/>.
 8. Hypertension awareness and psychological distress. American Heart Association Web site. <http://hyper.ahajournals.org/content/56/3/547>. Published 2010. Accessed November 16, 2016.
 9. Understand your risk for high blood pressure. American Heart Association Web site. http://www.heart.org/HEARTORG/Conditions/HighBloodPressure/UnderstandYourRiskforHighBloodPressure/Understand-Your-Risk-for-High-Blood-Pressure_UCM_002052_Article.jsp. Published June 29, 2016. Accessed November 16, 2016.
 10. Whelton PK, Carey RM, Aronow WS, Casey DE Jr, Collins KJ, Dennison Himmelfarb C, DePalma SM, Gidding S, Jamerson KA, Jones DW, MacLaughlin EJ, Muntner P, Ovbigele B, Smith SC Jr, Spencer CC, Stafford RS, Taler SJ, Thomas RJ, Williams KA Sr, Williamson JD, Wright JT Jr. 2017 ACC/AHA/AAPA/ABC/ACPM/AGS/APhA/ASH/ASPC/NMA/PCNA guideline for the prevention, detection, evaluation, and management of high blood pressure in adults: a report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines. http://professional.heart.org/professional/ScienceNews/UCM_496965_2017-Hypertension-Clinical-Guidelines.jsp. Published November 13, 2017. Accessed November 28, 2017.
 11. Top Ten Things to Know: 2017 Hypertension Guidelines. American Heart Association Web site. http://professional.heart.org/idc/groups/ahamah-public/@wcm/@sop/@smd/documents/downloadable/ucm_497371.pdf. Accessed November 28, 2017.

Disclaimer

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Easy Choice Health Plan – Harmony Health Plan of Illinois – Missouri Care – Ohana Health Plan, a plan offered by WellCare Health Insurance of Arizona – Staywell of Florida
WellCare (Arkansas, Connecticut, Florida, Georgia, Illinois, Kentucky, Louisiana, Mississippi, Nebraska, New Jersey, New York, South Carolina, Tennessee, Texas) – WellCare Prescription Insurance

Medical Policy Committee Approval History

Date	History and Revisions by the Medical Policy Committee
12/7/2017	<ul style="list-style-type: none"> • Approved by MPC. Updated guidelines published by AHA / ASA in November 2017.
10/5/2017	<ul style="list-style-type: none"> • Approved by MPC. Updated Care Management section.
12/8/2016	<ul style="list-style-type: none"> • Approved by MPC. Enhanced Care Management section. Revised with CM, DM, QI, UM, BH, Chief Medical Directors.
2/5/2015	<ul style="list-style-type: none"> • Approved by MPC. Additions from Heart Disease Care Management training.
6/17/2014	<ul style="list-style-type: none"> • Approved by MPC. Included items from the 2014 8th Joint National Committee guideline and the 2013 ACC/AHA guideline on cholesterol and cardiovascular risk.
7/5/2012	<ul style="list-style-type: none"> • Approved by MPC. Incorporated USPSTF screening recommendations.
12/1/2011	<ul style="list-style-type: none"> • New template design approved by MPC.
6/2009, 7/2010	<ul style="list-style-type: none"> • Approved by MPC. New.

Addendum

High blood pressure is a common condition in which the force of the blood against artery walls is high enough that it may eventually cause health problems, such as heart disease. Heart disease is a broad term used to describe a range of diseases that affect the human heart. One of the most diagnosed is disease of the blood vessels better known as coronary artery disease. Left untreated, this will eventually lead to heart failure. Hypertension (HTN) is a chronic medical condition in which the blood pressure in the arteries is elevated. Blood pressure is summarized by two measurements, systolic and diastolic, which depend on whether the heart muscle is contracting (systole) or relaxed between beats (diastole). This equals the maximum and minimum pressure, respectively. Hypertension puts strain on the heart, leading to heart disease and coronary artery disease if not treated; it is also a major risk factor for heart failure. Dietary and lifestyle changes can improve blood pressure control and decrease the risk of health complications. Drug treatment is still often necessary in people for whom lifestyle changes are not effective.¹

Several factors can lead to an increase in a person's blood pressure leading to hypertension. Educating patients on the causes, symptoms, and effects of hypertension is usually the simplest treatment. By knowing the effects, the patient is usually motivated to make personal changes on their own. These include:

- **Smoking** leads to decreased oxygen to the heart, increased blood pressure and heart rate, increase in blood clotting, and damage to cells that line coronary arteries and other blood vessels. **Tobacco use** is a common cause of avoidable hypertension. By quitting smoking, one lowers the amount of fatty build up in the arteries.
- **Genetic Factors** have been researched and have shown that there are eight gene variants in over half the population that directly affect blood pressure. Future studies that show exactly how these variants influence blood pressure and whether they can be targeted for treatment are needed.
- **Large salt intake** can damage arteries leading to the heart and increase blood pressure. Over time, the damage caused by the extra blood pressure may become so severe that the arteries burst or become completely clogged causing heart tissue to die. Research shows that people consuming diets of 1,500 mg of sodium had even better blood pressure lowering benefits. **Lower-sodium diets** may keep blood pressure from rising and help blood pressure medicines work better.
- **Additional fat tissue in the body** needs oxygen and nutrients in order to live, which requires the blood vessels to circulate more blood to the fat tissue. This increases the workload of the heart because it must pump more blood through additional blood vessels. More circulating blood also means more pressure on the artery walls. Higher pressure on the artery walls increases the blood pressure. **Losing weight** can cause blood pressure to lower. With less fat to oxygenate as well and less weight being carried by the body as a whole, stress on the heart and circulatory system is lowered leading to lower blood pressure as a whole.
- **Alcohol** causes an increased sympathetic nervous system response, which in turn causes the blood vessels to constrict, raising blood pressure. Alcohol also causes the release of hormones and salts in the blood, hormones such as catecholamines, epinephrine and salts such as magnesium and calcium ions which are all part of heart function. **By limiting alcohol intake**, a patient is not only reducing empty calories that will lead to fat build up, but also reduces the adverse chemical effects of alcohol on the circulatory system.
- **Being physically inactive** causes weakening of muscles, including the heart. Lack of activity also causes weight increase which adds further strain to the heart causing a rise in blood pressure. **Exercise** lowers blood pressure in two ways. Weight loss from exercise lowers stress on the heart, but it also strengthens muscles, including the heart, making it stronger and causing blood circulation to become more efficient.
- **Hypertensive heart disease** is the No. 1 cause of death associated with HBP; it refers to a group of disorders that includes heart failure, ischemic heart disease, hypertensive heart disease, and left ventricular hypertrophy.
- **Heart failure** does not mean the heart has stopped working. Rather, the heart's pumping power is weaker or the heart has become less elastic. With heart failure, blood moves through the heart's pumping chambers less effectively, and pressure in the heart increases, robbing the body of oxygen and nutrients.
- **Ventricular hypertrophy** is the thickening of the ventricular walls (lower chambers) in the heart. Although left ventricular hypertrophy is more common, enlargement can also occur in the right ventricle, or both ventricles.
- A **stroke** can occur when the blood supply to the part of the brain is interrupted or severely reduced, depriving brain tissue of oxygen and food.
- **Decreased kidney function** that lasts longer than 3 months is called chronic kidney disease (CKD). Diabetes (types 1 and 2) and high blood pressure are the most common causes of CKD. Enter text and bullets.

ASSESSMENT OF RISK FACTORS OR IDENTIFIABLE CAUSES OF HYPERTENSION

Major cardiovascular risk factors include:²

- Obesity (body mass index ≥ 30 kg/m²)
- Dyslipidemia
- Diabetes mellitus
- Cigarette smoking
- Physical inactivity
- Microalbuminuria, estimated glomerular filtration rate <60 mL/min

- Age (>55 for men, >65 for women)
- Family history of premature cardiovascular disease (men age <55, women age <65)

For members with comorbidities, it is recommended to prescribe BP-lowering medications in those with clinical CVD and new stage 1 or stage 2 hypertension to target a BP of <130/80 mm Hg (previously this was <140/90 mm Hg). The guideline recommends different follow-up intervals based on the stage of hypertension, type of medication, level of BP control, and presence of target organ damage.¹⁰

In addition, evaluation should be conducted for presence of target organ damage:²

- Heart (including left ventricular hypertrophy (LVH), angina or prior myocardial infarction, prior coronary revascularization and heart failure)
- Brain (including stroke or transient ischemic attack)
- Chronic kidney disease
- Peripheral arterial disease
- Retinopathy

Other identifiable causes of hypertension include:²

- | | |
|---|---|
| <ul style="list-style-type: none"> • Drug induced or related causes (see Causes of Resistant Hypertension below) • Chronic kidney disease • Primary aldosteronism • Cushing's syndrome or chronic steroid therapy | <ul style="list-style-type: none"> • Pheochromocytoma • Sleep apnea • Renovascular disease • Coarctation of aorta • Thyroid or parathyroid disease |
|---|---|

Causes of resistant hypertension include:²

- | | |
|---|---|
| <ul style="list-style-type: none"> • Drug-induced or other causes <ul style="list-style-type: none"> ○ Non-adherence ○ Inadequate doses ○ Inappropriate combinations ○ Nonsteroidal anti-inflammatory drugs; cyclooxygenase 2 inhibitors ○ Cocaine, amphetamines, other illicit drugs ○ Sympathomimetics (decongestants, anorectics) ○ Oral contraceptives ○ Adrenal steroids ○ Cyclosporine and tacrolimus ○ Erythropoietin ○ Licorice (including some chewing tobacco) ○ Selected over-the-counter dietary supplements and medicines (e.g., ephedra, ma haung, bitter orange) | <ul style="list-style-type: none"> • Improper BP measurement • Volume overload and pseudotolerance <ul style="list-style-type: none"> ○ Excess sodium intake ○ Volume retention from kidney disease ○ Inadequate diuretic therapy • Associated Conditions <ul style="list-style-type: none"> ○ Obesity ○ Excess alcohol intake • Identifiable causes of hypertension |
|---|---|

CLASSIFICATIONS USED IN DIAGNOSING AND MEASURING BLOOD PRESSURE

The following classifications are used in the diagnosis and measurement of blood pressure in adults:²

Blood Pressure Classification	Systolic Blood Pressure (mmHg)	Diastolic Blood Pressure (mmHg)
Normal	<120	and <80
Elevated BP ¹⁰	120-129	< 80
Stage 1 Hypertension	130 -139	or 80 -89
Stage 2 Hypertension	>140	or >90
Hypertensive Crisis	>180	or >120

Method	Notes
<i>In-office</i>	Two readings sitting in chair. Confirm elevated reading in contralateral arm.
<i>Ambulatory BP</i>	Indicated for evaluation of "white coat hypertension". Absence of 10-20

Monitoring percent BP decrease during sleep may indicate increased CVD risk.

Patient self-check Provides information on response to therapy. May help improve adherence to therapy and is useful for evaluating “white coat hypertension”.

Prior to initiating therapy, providers should also assess for:

- Risk factors and co-morbidities
- Identifiable causes of hypertension
- Presence of target organ damage
- Laboratory values including urinalysis, blood glucose and hematocrit, serum potassium, creatinine, calcium, and a lipid profile (after a 9 – 12 hour fast); urinary albumin excretion / creatinine ratio is optional.

For members with comorbidities, it is recommended to prescribe BP-lowering medications in those with clinical CVD and new stage 1 or stage 2 hypertension to target a BP of <130/80 mm Hg (previously this was <140/90 mm Hg). The guideline recommends different follow-up intervals based on the stage of hypertension, type of medication, level of BP control, and presence of target organ damage.¹⁰

The ultimate goal of antihypertensive therapy is to reduce cardiovascular and renal morbidity and mortality. Since most persons with hypertension, especially those >50 years of age, will reach the diastolic blood (DBP) pressure goal once the systolic blood pressure (SBP) goal is achieved, the primary focus should be on attaining the SBP goal. Treating SBP and DBP to targets that are 130/80 mmHg is associated with a decrease in CVD complications. In patients with hypertension and diabetes or renal disease, the blood pressure goal is < 130/80 mmHg.¹

Principles of hypertension treatment include:

- Treat to a BP <130/80 mmHg; BP <130/80 mmHg in patients with diabetes or chronic kidney disease.
- Majority of patients will require two medications to reach goal.
- Low dose Aspirin therapy should be considered ONLY when BP is controlled due to the risk of hemorrhagic stroke in patients with uncontrolled hypertension.

Lifestyle modifications are also necessary in treating hypertension. The following chart offers recommendations and the expected reduction a patient may see from the corresponding modification:

Modification	Recommendation	SBP Reduction
Weight reduction	Maintain normal body weight (BMI 18.5-24.9-24.9 24.9 kg/m ²)	5-20 mmHg/10kg
Adopt DASH eating plan	Consume a diet rich in fruits, vegetables, and low fat dairy products with reduced content of saturated and total fat.	8-14 mmHg
Dietary sodium reduction	Reduce dietary sodium intake to ≤ 100 mmol per day (2.4 g sodium or 6 g sodium chloride)	2-8 mmHg
Physical activity	Regular aerobic physical activity (e.g., brisk walking) at least 30 minutes per day, most days of the week	4-9 mmHg
Moderation of alcohol intake	Men: limit to ≤ 2 drinks* per day. Women and lighter weight persons: limit to ≤ 1 drink* per day.	2-4 mmHg

* 1 drink = ½ oz. or 15 mil ethanol (e.g., 12 oz beer, 5 oz wine, 1.5 oz 80-proof whiskey)