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 of adults age 18 and older. The CPG discusses Care Management goals and objectives (e.g., behavior modification, lifestyle changes) and behavioral health implications. The CPG outlines the organizations that the health plan aligns with regarding Hypertension and relevant Measurements of Compliance 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 of hypertension is crucial for minimizing the impact of the disease:

- Modifiable. Being overweight; high sodium intake; sedentary lifestyle; stress; drinking too much alcohol
- Non-Modifiable. Age, Race/Ethnicity, Gender, Family History, and consideration of disparities and cultural competency

Complications arising from chronic high blood pressure include:

- Aneurysm
- 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.

Hierarchy of Support

GUIDELINE HIERARCHY

CPGs are updated annually or as necessary due to updates made to guidelines or recommendations by the United States Preventive Services Task Force (USPSTF), Eighth Joint National Committee, American College of Cardiology (ACC), and the American Heart Association (AHA). When there are differing opinions noted by national organizations, the health plan 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, the health plan 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.).

The health plan aligns with USPSTF, Eighth Joint National Committee, ACC and AHA on the topic of Hypertension (see summary below).
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.4

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 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.6

### Evidence Based Practice

### MEASUREMENT OF COMPLIANCE

CMS has published the following measure related to hypertension:

**Medication Adherence for Hypertension (RAS antagonists).** Members 18 years and older should be educated on medication adherence, including filling of prescription blood pressure medication. Acceptable medication adherence is defined as filling the prescription often enough to cover 80% or more of the time they are prescribed.

CMS and NCQA have published the following measure:

**Controlling High Blood Pressure.** Members 18-85 years of age with a diagnosis of hypertension should adequately control their BP based on the following criteria:

- 18–59 years old, blood pressure should be <140/90
- 60–85 years old with history of TIA/stroke, diabetes and high cardiovascular risk (based on individualized assessment), blood pressure should be <140/90
- 60–85 years old without diabetes, blood pressure should be <150/90

### 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

- Headache
- Chest pain
- Dizziness (vertigo)
- Shortness of breath
- 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 <140) and/or diastolic (target <90). 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.
OTHER CONSIDERATIONS

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

The health plan provides 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:

- Understanding the diagnosis of hypertension
- Identifying risk factors and triggers
- Medication management
- Nutrition and dietary considerations
- Exercise and Fitness
- Promoting self-care management

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

PHARMACOLOGY

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

**NOTE:** Other resource guidelines may address titration models and the addition of new drugs over time in a stepwise approach.

- **Classes of Antihypertensive Drugs**
  - Diuretics
  - Alpha Blockers/Inhibitors
  - Beta Blockers
  - ACE Inhibitors
  - Angiotensin II Receptor Blockers (Use ACE Inhibitors First)
  - Calcium Channel Blocking Agents
  - 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 diphosphopyridine calcium antagonists.

<table>
<thead>
<tr>
<th>Compelling Indication</th>
<th>Recommended Drugs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heart Failure</td>
<td>Diuretic, BB, ACEI, ARB, Aldo ANT</td>
</tr>
<tr>
<td>Post myocardial Infarction</td>
<td>BB, ACEI, Aldo ANT</td>
</tr>
<tr>
<td>High Coronary disease Risk</td>
<td>Diuretic, BB, ACEI, CCB</td>
</tr>
<tr>
<td>Diabetes</td>
<td>Diuretic, BB, ACEI, ARB, CCB</td>
</tr>
<tr>
<td>Chronic Kidney Disease</td>
<td>ACEI, ARB</td>
</tr>
<tr>
<td>Recurrent Stroke Prevention</td>
<td>Diuretic, ACEI</td>
</tr>
</tbody>
</table>

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

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:

- 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 $<65$)

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

- 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:

- Drug induced or related causes (see Causes of Resistant Hypertension below)
- Chronic kidney disease
- Primary aldosteronism
- Cushing’s syndrome or chronic steroid therapy

Causes of resistant hypertension include:

- Drug-induced or other causes
  - 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)

- Pheochromocytoma
- Sleep apnea
- Renovascular disease
- Coarctation of aorta
- Thyroid or parathyroid disease

- Improper BP measurement
- Volume overload and pseudotolerance
  - Excess sodium intake
  - Volume retention from kidney disease
  - Inadequate diuretic therapy

- Associated Conditions
  - Obesity
  - Excess alcohol intake

- Identifiable causes of hypertension
CLASSIFICATIONS USED IN DIAGNOSING AND MEASURING BLOOD PRESSURE

Algorithm of Treatment

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

<table>
<thead>
<tr>
<th>Blood Pressure Classification</th>
<th>Systolic Blood Pressure (mmHg)</th>
<th>Diastolic Blood Pressure (mmHg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>&lt;120</td>
<td>and &lt;80</td>
</tr>
<tr>
<td>Elevated BP</td>
<td>120-129</td>
<td>&lt; 80</td>
</tr>
<tr>
<td>Stage 1 Hypertension</td>
<td>130 -139</td>
<td>or 80 -89</td>
</tr>
<tr>
<td>Stage 2 Hypertension</td>
<td>&gt;140</td>
<td>or &gt;90</td>
</tr>
<tr>
<td>Hypertensive Crisis</td>
<td>&gt;180</td>
<td>or &gt;120</td>
</tr>
</tbody>
</table>

Method | Notes
--- | ---
In-office | Two readings sitting in chair. Confirm elevated reading in contralateral arm.
Ambulatory BP Monitoring | Indicated for evaluation of “white coat hypertension”. Absence of 10-20 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.

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.

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:

<table>
<thead>
<tr>
<th>Modification</th>
<th>Recommendation</th>
<th>SBP Reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight reduction</td>
<td>Maintain normal body weight (BMI 18.5-24.9-24.9 24.9 kg/m²)</td>
<td>5-20 mmHg/10kg</td>
</tr>
<tr>
<td>Adopt DASH eating plan</td>
<td>Consume a diet rich in fruits, vegetables, and low fat dairy products with reduced content of saturated and total fat.</td>
<td>8-14 mmHg</td>
</tr>
<tr>
<td>Dietary sodium reduction</td>
<td>Reduce dietary sodium intake to ≤ 100 mmol per day (2.4 g sodium or 6 g sodium chloride)</td>
<td>2-8 mmHg</td>
</tr>
</tbody>
</table>
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