Prevention and Management of Systemic Hypertension

### Diagnosis and Measurement of Blood Pressure for Adults (18 years and older)
(Source: NHLBI, 2004)

<table>
<thead>
<tr>
<th>Blood Pressure Classification</th>
<th>Systolic Blood Pressure (mmHg)</th>
<th>Diastolic Blood Pressure (mmHg)</th>
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<tbody>
<tr>
<td>Normal</td>
<td>&lt;120</td>
<td>and &lt;80</td>
</tr>
<tr>
<td>Prehypertension</td>
<td>120-139</td>
<td>or 80-89</td>
</tr>
<tr>
<td>Stage 1 Hypertension</td>
<td>140-159</td>
<td>or 90-99</td>
</tr>
<tr>
<td>Stage 2 Hypertension</td>
<td>≥160</td>
<td>or ≥100</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Method</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>In-office</td>
<td>Two readings sitting in chair. Confirm elevated reading in contralateral arm.</td>
</tr>
<tr>
<td>Ambulatory BP Monitoring</td>
<td>Indicated for evaluation of &quot;white coat hypertension&quot;. Absence of 10-20 percent BP decrease during sleep may indicate increased CVD risk.</td>
</tr>
<tr>
<td>Patient self-check</td>
<td>Provides information on response to therapy. May help improve adherence to therapy and is useful for evaluating &quot;white coat hypertension&quot;.</td>
</tr>
</tbody>
</table>

Patients should have a history and physical examination, including:

- Measurement of BP (with appropriate size cuff) with verification in the contralateral arm
- Examination of the optic fundi
- Calculation of body mass index (BMI) (measurement of waist circumference also may be useful)
- Auscultation for carotid, abdominal, and femoral bruits
- Palpation of the thyroid gland
- Thorough examination of the heart and lungs
- Examination of the abdomen for enlarged kidneys, masses, and abnormal aortic pulsation
- Palpation of the lower extremities for edema and pulses
- Neurological assessment
- Electrocardiogram

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 to 12 hour fast). (Urinary albumin excretion / creatinine ratio is optional).
Assessment of Risk Factors or Identifiable Causes of Hypertension
(Source: NHLBI, 2004)

The United States Preventive Services Task Force (USPSTF) (2007) recommends screening for high blood pressure in adults aged 18 and older (Grade A Recommendation).

Major cardiovascular risk factors include:
- Obesity (body mass index $\geq 30$ 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
  - Left ventricular hypertrophy
  - Angina or prior myocardial infarction
  - Prior coronary revascularization
  - Heart failure
- Brain
  - 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
- Pheochromocytoma
- Sleep apnea
- Renovascular disease
- Coarctation of aorta
- Thyroid or parathyroid disease

Hypertension and Cholesterol
(Source: James & et al., 2014)

In 2014, the Eighth Joint National Committee released recommendations on the management of high blood pressure.

**Recommendation 1**
- In the general population aged 60 years or older, initiate pharmacologic treatment to lower BP at systolic blood pressure (SBP) of 150mmHg or higher or diastolic blood pressure (DBP) of 90mmHg or higher and treat to a goal SBP lower than 150mmHg and goal DBP lower than 90mmHg. *Strong Recommendation – Grade A*
- In the general population aged 60 years or older, if pharmacologic treatment for high BP results in lower achieved SBP (for example, <140mmHg) and treatment is not associated with adverse effects on health or quality of life,
treatment does not need to be adjusted. *Expert Opinion – Grade E*

**Recommendation 2**
- In the general population younger than 60 years, initiate pharmacologic treatment to lower BP at DBP of 90 mm Hg or higher and treat to a goal DBP of lower than 90mmHg. For ages 30 through 59 years, *Strong Recommendation – Grade A.* For ages 18 through 29 years, *Expert Opinion – Grade E.*

**Recommendation 3**
- In the general population younger than 60 years, initiate pharmacologic treatment to lower BP at SBP of 140 mm Hg or higher and treat to a goal SBP of lower than 140mmHg. *Expert Opinion – Grade E*

**Recommendation 4**
- In the population aged 18 years or older with CKD, initiate pharmacologic treatment to lower BP at SBP of 140mmHg or higher or DBP of 90mmHg or higher and treat to goal SBP of lower than 140mm Hg and goal DBP lower than 90mmHg. *Expert Opinion – Grade E*

**Recommendation 5**
- In the population aged 18 years or older with diabetes, initiate pharmacologic treatment to lower BP at SBP of 140mmHg or higher or DBP of 90 mm Hg or higher and treat to a goal SBP of lower than 140mmHg and goal DBP lower than 90mmHg. *Expert Opinion – Grade E*

**Recommendation 6**
- In the general nonblack population, including those with diabetes, initial antihypertensive treatment should include a thiazide-type diuretic, calcium channel blocker (CCB), angiotensin-converting enzyme inhibitor (ACEI), or angiotensin receptor blocker (ARB). *Moderate Recommendation – Grade B*

**Recommendation 7**
- In the general black population, including those with diabetes, initial antihypertensive treatment should include a thiazide-type diuretic or CCB. For general black population: *Moderate Recommendation – Grade B.* For black patients with diabetes: *Weak Recommendation – Grade C.*

**Recommendation 8**
- In the population aged 18 years or older with CKD and hypertension, initial (or add-on) antihypertensive treatment should include an ACEI or ARB to improve kidney outcomes. This applies to all CKD patients with hypertension regardless of race or diabetes status. *Moderate Recommendation – Grade B*

**Recommendation 9**
- The main objective of hypertension treatment is to attain and maintain goal BP. If goal BP is not reached within a month of treatment, increase the dose of the initial drug or add a second drug from one of the classes in recommendation 6 (thiazide-type diuretic, CCB, ACEI, or ARB). The clinician should continue to assess BP and adjust the treatment regimen until goal BP is reached. If goal BP cannot be reached with 2 drugs, add and titrate a third drug from the list provided. Do not use an ACEI and an ARB together in the same patient. If goal BP cannot be reached using the drugs in recommendation 6 because of a contraindication or the need to use more than 3 drugs to reach goal BP, antihypertensive drugs from other classes can be used. Referral to a hypertension specialist may be indicated for patients in whom goal BP cannot be attained using the above strategy or for the management of complicated patients for whom additional clinical consultation is needed. *Expert Opinion – Grade E*
Treatment of Cholesterol to Reduce Atherosclerotic Cardiovascular Risk  
(Source: Stone & et al., 2013)

Highlights of a 2013 joint report by the American College of Cardiology and the American Heart Association highlighted the following regarding treatment of cholesterol with respect to one's atherosclerotic cardiovascular risk:

- Statins are simply one of the important tools doctors can use to save millions of people from the two leading causes of death in the world. The guidelines suggest that the number of Americans ultimately taking statins may be higher than the current 30 million or so, but the goal of the guidelines is to make sure this treatment is used for people who can benefit. Estimates show about a third of U.S. adults could benefit from statins – this includes nearly all patients who have already had a cardiovascular event (e.g., heart attack or stroke) and thus statins would be considered secondary prevention.
- The guideline encourages Providers and Members to work together on determining the best course of treatment – statins, lifestyle changes or some other therapy.
- Doctors have long prescribed statins based on a cholesterol number, particularly the level of “bad” LDL cholesterol. The guideline advises assessing factors such as age, gender, race, whether a patient smokes, blood pressure and whether it’s being treated, whether a person has diabetes, as well as blood cholesterol levels in determining their risk. Family history should also be taken into consideration.
- The guideline recommends statin therapy for the following groups:
  - People without cardiovascular disease who are 40 to 75 years old and have a 7.5 percent or higher risk for having a heart attack or stroke within 10 years.
  - People with a history of a cardiovascular event (heart attack, stroke, stable or unstable angina, peripheral artery disease, transient ischemic attack, or coronary or other arterial revascularization).
  - People 21 and older who have a very high level of bad cholesterol (190 mg/dL or higher).
  - People with Type 1 or Type 2 diabetes who are 40 to 75 years old.
- For patients taking statins, the guidelines states that they no longer need to get LDL cholesterol levels down to a specific target number – a significant departure from how doctors have treated cholesterol for years. While research clearly shows that lowering LDL lowers the risk for heart attack and stroke, there is no evidence to prove that one target number is best. The guidelines focus on matching a patient's risk level with the intensity of statin treatment. In addition to lowering cholesterol, statins have other biochemical effects that may also help reduce the risk for heart attack and stroke. Most statins are now available in generic versions for as little as $4 per month.
- Doctors are advised to no longer prescribe additional cholesterol-lowering drugs (e.g., fibrates, niacin) to patients who do not reach targets with statins alone as they have not been shown to reduce heart attack or stroke risk.
- Members should be encouraged by their Provider to follow a heart-healthy diet, be physically active on a regular basis, abstain from smoking and maintain a healthy weight.

Causes of Resistant Hypertension  
(Source: NHLBI, 2004)

- Improper BP measurement
- Volume overload and pseudotolerance
  - Excess sodium intake
  - Volume retention from kidney disease
  - Inadequate diuretic therapy
• Drug-induced or other causes
  o Non-adherence
  o Inadequate doses
  o Inappropriate combinations
  o Nonsteroidal anti-inflammatory drugs; cyclooxygenase 2 inhibitors
  o Cocaine, amphetamines, other illicit drugs
  o Sympathomimetics (decongestants, anorectics)
  o Oral contraceptives
  o Adrenal steroids
  o Cyclosporine and tacrolimus
  o Erythropoietin
  o Licorice (including some chewing tobacco)
  o Selected over-the-counter dietary supplements and medicines (e.g., ephedra, ma huang, bitter orange)
• Associated Conditions
  o Obesity
  o Excess alcohol intake
• Identifiable causes of hypertension

**Goals of Therapy and Principles of Treatment**  
(Source: NHLBI, 2004)

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 140/90 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 <140/90 mmHg or 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>
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<tbody>
<tr>
<td>Weight reduction</td>
<td>Maintain normal body weight (BMI 18.5-24.9)</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>
<tr>
<td>Physical activity</td>
<td>Regular aerobic physical activity (e.g., brisk walking) at least 30 minutes per day, most days of the week</td>
<td>4-9 mmHg</td>
</tr>
<tr>
<td>Moderation of alcohol intake</td>
<td>Men: limit to ≤ 2 drinks* per day. Women and lighter weight persons: limit to ≤ 1 drink* per day.</td>
<td>2-4 mmHg</td>
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</tbody>
</table>

* 1 drink = ½ oz. or 15 mil ethanol (e.g., 12 oz beer, 5 oz wine, 1.5 oz 80-proof whiskey)
Pharmacologic Treatment and Indications for Individual Drug Classes
(Source: NHLBI, 2004)

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 dipyridamole calcium antagonists.

<table>
<thead>
<tr>
<th>Compelling Indication</th>
<th>Recommended Drugs</th>
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<tbody>
<tr>
<td>Heart Failure</td>
<td>Diuretic, BB, ACEI, ARB, Aldo ANT</td>
</tr>
<tr>
<td>Postmyocardial 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

REFERENCES


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**MEDICAL POLICY COMMITTEE HISTORY AND REVISIONS**

<table>
<thead>
<tr>
<th>Date</th>
<th>History and Revisions by the Medical Policy Committee</th>
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<tbody>
<tr>
<td>6/17/2014</td>
<td>• Approved by MPC. Included items from the 2014 Eighth Joint National Committee guideline and the 2013 ACC/AHA guideline on cholesterol and cardiovascular risk.</td>
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<tr>
<td>7/5/2012</td>
<td>• Approved by MPC. Incorporated USPSTF screening recommendations.</td>
</tr>
<tr>
<td>12/1/2011</td>
<td>• New template design approved by MPC.</td>
</tr>
<tr>
<td>6/2009, 7/2010</td>
<td>• Approved by MPC.</td>
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