Hypertension is the most common primary diagnosis in America. About 78 million US adults have been diagnosed with high blood pressure. The higher the blood pressure, the greater is the chance of heart attack, heart failure, stroke, kidney disease and vascular disease.

Medical Associates Health Plans supports increasing awareness, prevention, treatment, and control of hypertension (high blood pressure (BP)).

**Hypertension Prevention, Screening, Counseling, and Management**

Optimally, a screening blood pressure measurement should be obtained from any patient greater than or equal to 18 years of age in the health care system at every health care encounter.

Prevention of hypertension begins with increasing patient awareness of blood pressure readings, providing education to inform that high blood pressure is often asymptomatic, and alerting patients to the risks associated with unmanaged hypertension.

Hypertension should not be diagnosed on the basis of a single measurement. The classification should be based on the average of two or more properly measured, seated BP readings on each of two or more office visits. BP measurements <120/80 are considered normal. Systolic BP measurements 120 -139, or diastolic BP levels between 80 - 89 are considered pre-hypertensive. BP reading ≥140/90 are considered hypertensive.

After any elevated reading, a second measurement should be performed and documented during the same patient visit.

At a minimum, patients should have their blood pressure checked and documented by their primary care provider on an annual basis.

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Table 1. Classification and Management of blood pressure for adults*
<table>
<thead>
<tr>
<th>BP Classification</th>
<th>SBP* mmHg</th>
<th>DBP* mmHg</th>
<th>Lifestyle Modification</th>
<th>Initial Drug Therapy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>&lt;120</td>
<td>and &lt;80</td>
<td>Encourage</td>
<td>No antihypertensive drug indicated.</td>
</tr>
<tr>
<td>Prehypertension</td>
<td>120-139</td>
<td>or 80-89</td>
<td>Yes</td>
<td>Drug(s) for compelling indications t</td>
</tr>
<tr>
<td>Stage 1 Hypertension</td>
<td>140-159</td>
<td>or 90-99</td>
<td>Yes</td>
<td>Thiazide-type diuretics for most. May consider ACEI, ARB, BB, CCB, or combination.</td>
</tr>
<tr>
<td>Stage 2 Hypertension</td>
<td>≥160</td>
<td>or ≥100</td>
<td>Yes</td>
<td>Two-drug combination for most ç (usually thiazide-type diuretic and ACEI or ARB or BB or CCB).</td>
</tr>
</tbody>
</table>

* DBP, diastolic blood pressure; SBP, systolic blood pressure.
* Drug abbreviations: ACEI, angiotensin converting enzyme inhibitor; ARB, angiotensin receptor blocker; BB, beta-blocker; CCB, calcium channel blocker.

* *Treatment determined by highest BP category
* ç Initial combined therapy should be used cautiously in those at risk for orthostatic hypotension.
* t Treat patients with chronic kidney disease or diabetes to BP goal of 130/80 mmHg.

**Evaluation of patients with documented hypertension has three objectives:**

1. To assess lifestyle and identify other cardiovascular risk factors or concomitant disorders that may affect prognosis and guide treatment
2. To assess the presence or absence of target organ damage and CVD. See Table 2.
3. To reveal identifiable causes of high BP. See Table 3.
### Table 2.

**Components of Cardiovascular Risk Stratification in Patients With Hypertension**

<table>
<thead>
<tr>
<th>Major Risk Factors</th>
<th>Hypertension*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Tobacco usage</td>
</tr>
<tr>
<td></td>
<td>Obesity* (body mass index ≥ 30 kg/m²)</td>
</tr>
<tr>
<td></td>
<td>Physical inactivity</td>
</tr>
<tr>
<td></td>
<td>Elevated LDL (or total) cholesterol, or low HDL cholesterol*</td>
</tr>
<tr>
<td></td>
<td>Elevated triglycerides*</td>
</tr>
<tr>
<td></td>
<td>Diabetes mellitus*</td>
</tr>
<tr>
<td></td>
<td>Microalbuminuria or estimated GFR &lt;60mL/min</td>
</tr>
<tr>
<td></td>
<td>Age (older than 55 for men, 60 for women)</td>
</tr>
<tr>
<td></td>
<td>Family history of premature cardiovascular disease (men under age 55 or women under age 60)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Target Organ Damage/Clinical Cardiovascular Disease</th>
<th>Heart</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Left ventricular hypertrophy</td>
</tr>
<tr>
<td></td>
<td>• Angina or prior myocardial infarction</td>
</tr>
<tr>
<td></td>
<td>• Prior coronary revascularization</td>
</tr>
<tr>
<td></td>
<td>• Heart failure</td>
</tr>
<tr>
<td>Brain</td>
<td>Stroke or transient ischemic attack</td>
</tr>
</tbody>
</table>

Chronic kidney disease  
Peripheral arterial disease  
Retinopathy  

GFR, glomerular filtration rate

*Components of the metabolic syndrome

### Table 3.

**Identifiable (not necessarily common) causes of hypertension**

- Sleep apnea  
- Drug induced or related causes  
- Chronic kidney disease  
- Primary aldosteronism  
- Renovascular disease  
- Chronic steroid therapy and Cushing’s syndrome  
- Pheochromocytoma  
- Coarctation of the aorta  
- Thyroid or parathyroid disease
**Treatment/Management**
1. History and physical exam including family history of hypertension
2. Auscultation of heart; vascular exam
3. Weight and height
4. Lifestyle Modifications
   A. Dietary instruction including weight reduction, no added salt, low fat and low cholesterol diets
   B. Counseling regarding:
      1. Smoking cessation
      2. Alcohol use in moderation
      3. Regular exercise
5. Baseline electrocardiogram, UA, blood glucose, hematocrit, potassium, creatinine (or the corresponding estimated glomerular filtration rate – eGFR), lipid profile and calcium.
6. Annual urine dipstick for protein.
7. Once antihypertensive drug therapy is initiated, most patients should return for follow up and adjustment of medications at approximately monthly intervals until the BP goal is reached.
8. More frequent visits will be necessary for patients with stage 2 hypertension, or with complicating co-morbid conditions.
9. After BP is at goal and stable, follow up visits can usually be at 3-to 6-month intervals. (Co-morbidities, such as heart failure, associated diseases such as diabetes, and the need for laboratory tests influence the frequency of visits).

**Table 4. Recommended Drugs for Compelling Indications**

<table>
<thead>
<tr>
<th>Compelling Indication*</th>
<th>DIURETIC</th>
<th>BB</th>
<th>ACEI</th>
<th>ARB (If ACEI not tolerated)</th>
<th>CCB</th>
<th>ALDOANT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heart failure</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Post-myocardial infarction</td>
<td>X</td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High coronary disease risk</td>
<td>X</td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diabetes</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chronic kidney disease</td>
<td>X</td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recurrent stroke prevention</td>
<td>X</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Drug abbreviations: ACEI, angiotensin converting enzyme inhibitor; ARB, angiotensin receptor blocker; Aldo ANT, aldosterone antagonist; BB, beta-blocker; CCB, calcium channel blocker.

*Compelling indications for antihypertensive drugs are based on benefits from outcome studies or existing clinical guidelines: the compelling indication is managed in parallel with the BP.
Algorithm for Treatment of Hypertension

**LIFESTYLE MODIFICATIONS**

- Not at Goal Blood Pressure (<140/90 mmHg)
  - (<130/80 mmHg for patients with diabetes or chronic kidney disease)

**INITIAL DRUG CHOICES**

- Without Compelling Indications
- With Compelling Indications

### Stage 1 Hypertension
(SBP 140-159 or DPB 90-99 mmHg)
- Thiazide-type diuretics for most. May consider ACEI, ARB, BB, CCB, or combination.

### Stage 2 Hypertension
(SBP ≥160 or DPB ≥100 mmHg)
- Two-drug combination for most (usually thiazide-type diuretic and ACEI, or ARB, or BB, or CCB).

### Drug(s) for the compelling indications
(See table 4)
- Other antihypertensive drugs (diuretics, ACEI, ARB, BB, CCB) as needed.

**NOT AT GOAL BLOOD PRESSURE**

- Optimize dosages or add additional drugs until goal blood pressure is achieved.
- Consider consultation with hypertension specialist.

DBP, diastolic blood pressure; SBP, systolic blood pressure.
Drug abbreviations: ACEI, angiotension converting enzyme inhibitor; ARB, angiotension receptor blocker; BB, beta-blocker; CCB, calcium channel blocker.

The most effective therapy prescribed can control hypertension only if patients are motivated to take the prescribed medication and to establish and maintain a health-promoting lifestyle. Motivation improves when patients establish a trusting rapport, have positive experiences with their practitioner. Empathy builds trust and is a potent motivator.

**References:**

National Guideline Clearinghouse @ [www.guideline.gov](http://www.guideline.gov)
