Management of Adult Hypertension

Purpose
To identify and promote the essential elements of management of adult hypertension.

Key Recommendations
- Treat to blood pressure (BP) target levels:
  - <140/90 mm Hg for ages <60
  - <150/90 mm Hg for ages ≥60 years with no diabetes and no kidney disease¹,²
- Prescribe life style modifications (e.g. effectiveness of 1,600 mg sodium DASH eating plan can be equivalent to drug monotherapy).
- Initial antihypertensive treatment:
  - In 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 (ARB).
  - In the general black population, including those with diabetes, initial antihypertensive treatment should include a thiazide-type diuretic or CCB.³
  - In the population aged ≥18 years with CKD (including all CKD patients with hypertension regardless of race or diabetes status), initial (or add-on) antihypertensive treatment should include an ACEI or ARB to improve kidney outcomes.

Measures/Implementation
- Treat to blood pressure (BP) target levels:
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  - In the population aged ≥18 years with CKD (including all CKD patients with hypertension regardless of race or diabetes status), initial (or add-on) antihypertensive treatment should include an ACEI or ARB to improve kidney outcomes.

High Risk Populations/Disparities
- In African Americans, hypertension is more common, more severe, develops at an earlier age and leads to more clinical sequelae than in age-matched non-Hispanic Whites.
- In Monroe County, in 2012, 32% of all adults have high blood pressure (41% of those ages 35 and older). Differences by residence (city/suburbs) and race/ethnicity: City/Suburbs - 50% vs. 39%; African American/White - 64% vs. 39%; Latino/White - 42% vs. 39%.
- In a national survey from 2011 – 2012: men and women had similar prevalence and awareness of hypertension, but more women than men were treating their hypertension and had it under control; young adults (18–39) have lower awareness, treatment, and control of their hypertension compared with older adults; prevalence was still highest among non-Hispanic black adults but awareness, treatment, and control of hypertension were similar among non-Hispanic black, non-Hispanic white, and Hispanic adults.

Footnotes:
1. National Committee for Quality Assurance (NCQA). HEDIS 2015: Healthcare Effectiveness Data and Information Set: The percentage of members 18-85 years of age who had a diagnosis of hypertension (HTN) and whose BP was adequately controlled during the measurement year using the following criteria: Members 18–59 years of age whose BP was <140/90 mm Hg; Members 60–85 years of age without a diagnosis of diabetes whose BP was <150/90 mm Hg. (HEDIS measure also used for Medicare Star Ratings.).
2. If hypertensive patient is already controlled in lower achieved SBP (eg, <140 mm Hg), treatment does not need to be adjusted.
3. 2014 ADA Standard of Medical Care: Pharmacological therapy for patients with diabetes and hypertension should comprise a regimen that includes either an ACE inhibitor or an angiotensin receptor blocker (ARB). If one class is not tolerated, the other should be substituted.
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Identification and Evaluation

<table>
<thead>
<tr>
<th>Blood Pressure Measurement Techniques</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Method</strong></td>
</tr>
<tr>
<td>In-Office</td>
</tr>
<tr>
<td>Ambulatory BP Monitoring</td>
</tr>
<tr>
<td>Patient Self -Check</td>
</tr>
</tbody>
</table>

Causes of Resistant Hypertension

- Improper BP measurement
- Excess sodium intake
- Inadequate diuretic therapy
- Medication
  - Inadequate doses
  - Drug actions and interactions (e.g., nonsteroidal anti-inflammatory drugs (NSAIDs), illicit drugs, sympathomimetics, oral contraceptives)
  - Over-the-counter (OTC) drugs and herbal supplements
- Excess alcohol intake
- Identifiable causes of hypertension

Compelling Indications for Individual Drug Classes

<table>
<thead>
<tr>
<th>Compelling Indication</th>
<th>Initial Therapy Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heart Failure</td>
<td>THIAZ, BB, ACEI / ARB, ALDO ANT</td>
</tr>
<tr>
<td>Post myocardial infarction</td>
<td>BB, ACEI / ARB, ALDO ANT</td>
</tr>
<tr>
<td>High CVD risk</td>
<td>THIAZ, ACEI / ARB, CCB</td>
</tr>
<tr>
<td>Diabetes</td>
<td>THIAZ, ACEI / ARB, CCB</td>
</tr>
<tr>
<td>Chronic kidney disease</td>
<td>ACEI / ARB</td>
</tr>
<tr>
<td>Recurrent stroke prevention</td>
<td>THIAZ, ACEI / ARB</td>
</tr>
</tbody>
</table>

Key: THIAZ = thiazide diuretic, ACEI = angiotensin converting enzyme inhibitor, ARB = angiotensin receptor blocker, BB = beta blocker, CCB = calcium channel blocker, ALDO ANT = aldosterone antagonist

Strategies for Improving Adherence to Therapy

- Clinician empathy increases patient trust, motivation, and adherence to therapy.
- Physicians should consider their patients’ cultural beliefs and individual attitudes in formulating therapy.


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Lifestyle Modifications

Principles of Lifestyle Modification

- Encourage healthy lifestyles for all individuals.
- Prescribe lifestyle modifications for all patients with prehypertension and hypertension.
- Components of lifestyle modifications include weight reduction, DASH eating plan, dietary sodium reduction, aerobic physical activity, smoking cessation, and moderation of alcohol consumption.

<table>
<thead>
<tr>
<th>Modification</th>
<th>Recommendation</th>
<th>AVG. SBP Reduction Range (+)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight Reduction</td>
<td>Maintain normal body weight (BMI 18.5 – 24.9 kg/m²)</td>
<td>5 - 20 mmHg/10 kg</td>
</tr>
<tr>
<td>DASH eating plan</td>
<td>Adopt 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 &lt;100 mmol per day (2.4 g sodium or 6 g sodium chloride). Decrease consumption processed foods, fast-food and/or restaurant foods.</td>
<td>2 – 8 mmHg</td>
</tr>
<tr>
<td>Aerobic 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 consumption</td>
<td>Men: Limit to ≤ 2 drinks * per day. Women and lighter weight persons: limit to &lt; 1 drink * per day.</td>
<td>2 -4 mmHg</td>
</tr>
</tbody>
</table>

(+) Effects are dose and time dependent.

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


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**Treatment Algorithm**

1. Adult aged ≥18 years with hypertension
   - Implement lifestyle interventions (continue throughout management).
   - Set blood pressure goal and initiate blood pressure lowering medication based on age, diabetes, and chronic kidney disease (CKD).

2. General population (no diabetes or CKD)
   - Age ≥60 years
     - Blood pressure goal: SBP < 150 mm Hg, DBP < 90 mm Hg
       - Nonblack: Initiate thiazide-type diuretic or ACEI or ARB or CCB, alone or in combination.
       - Black: Initiate thiazide-type diuretic or CCB, alone or in combination.
   - Age <60 years
     - Blood pressure goal: SBP < 140 mm Hg, DBP < 90 mm Hg
     - All races: Initiate ACEI or ARB, alone or in combination with other drug class.

3. Diabetes or CKD present
   - All ages: Diabetics present
     - No CKD
       - Blood pressure goal: SBP < 140 mm Hg, DBP < 90 mm Hg
       - Nonblack: Initiate thiazide-type diuretic or ACEI or ARB or CCB, alone or in combination.
       - Black: Initiate thiazide-type diuretic or CCB, alone or in combination.
   - All ages: CKD present with or without diabetes
     - Blood pressure goal: SBP < 140 mm Hg, DBP < 90 mm Hg
     - All races: Initiate ACEI or ARB, alone or in combination with other drug class.

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SBP indicates systolic blood pressure; DBP, diastolic blood pressure; ACEI, angiotensin-converting enzyme; ARB, angiotensin receptor blocker; and CCB, calcium channel blocker.

ACEIs and ARBs should not be used in combination.

If blood pressure fails to be maintained at goal, reenter the algorithm where appropriate based on the current individual therapeutic plan.

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Strategies to Dose Antihypertensive Drugs

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Start one drug, titrate to maximum dose, and then add a second drug</td>
<td>If goal BP is not achieved with the initial drug, titrate the dose of the initial drug up to the maximum recommended dose to achieve goal BP. If goal BP is not achieved with the use of one drug despite titration to the maximum recommended dose, add a second drug from the list (thiazide-type diuretic, CCB, ACEI, or ARB) and titrate up to the maximum recommended dose of the second drug to achieve goal BP. If goal BP is not achieved with 2 drugs, select a third drug from the list (thiazide-type diuretic, CCB, ACEI, or ARB), avoiding the combined use of ACEI and ARB. Titrater the third drug up to the maximum recommended dose to achieve goal BP.</td>
</tr>
<tr>
<td>B</td>
<td>Start one drug and then add a second drug before achieving maximum dose of the initial drug</td>
<td>Start with one drug then add a second drug before achieving the maximum recommended dose of the initial drug, then titrate both drugs up to the maximum recommended doses of both to achieve goal BP. If goal BP is not achieved with 2 drugs, select a third drug from the list (thiazide-type diuretic, CCB, ACEI, or ARB), avoiding the combined use of ACEI and ARB. Titrater the third drug up to the maximum recommended dose to achieve goal BP.</td>
</tr>
<tr>
<td>C</td>
<td>Begin with 2 drugs at the same time, either as 2 separate pills or as a single pill combination</td>
<td>Initiate therapy with 2 drugs simultaneously, either as 2 separate drugs or as a single pill combination. Some committee members recommend starting therapy with ≥2 drugs when SBP is &gt;160 mm Hg and/or DBP is &gt;100 mm Hg, or if SBP is &gt;20 mm Hg above goal and/or DBP is &gt;10 mm Hg above goal. If goal BP is not achieved with 2 drugs, select a third drug from the list (thiazide-type diuretic, CCB, ACEI, or ARB), avoiding the combined use of ACEI and ARB. Titrater the third drug up to the maximum recommended dose.</td>
</tr>
</tbody>
</table>

Abbreviations: ACEI, angiotensin-converting enzyme; ARB, angiotensin receptor blocker; BP, blood pressure; CCB, calcium channel blocker; DBP, diastolic blood pressure; SBP, systolic blood pressure.


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Physician Resources for Patients

**Academy of Nutrition and Dietetics** – Five steps to manage high blood pressure
- **Find a registered dietician** – Find a registered dietician in your area.

**American Heart Association/American Stroke Association** – Heart360® - offers online tool to help patients manage blood pressure. Physicians can connect with their patients and monitor progress.

**Center for Disease Control and Prevention**
- **Million Hearts® Campaign** - Provides resources to help individuals, health care professionals, and organizations to help prevent and control high blood pressure.
  - **Blood Pressure Toolkit** – designed to be used with patients to help address high blood pressure in clinics and communities.
  - **Spanish Language Toolkit and Resources**
  - **Facebook**
  - **Self-Measured Blood Pressure Monitoring Action Guide** – Guidance for monitoring patients’ blood pressure in between office visits
- **Sodium Intake Widget** - a CDC.gov application that displays content directly on your physician practice websites. There's no technical maintenance. CDC.gov will update the content automatically. Widget helps patients discover how much salt is in their food and the effect on their health.
- **Translating the Dietary Approaches to Stop Hypertension (DASH) Diet for Use in Underresourced, Urban African American Communities, 2010**

**Dietary Approaches to Stop Hypertension (DASH)** – A flexible and balanced eating plan endorsed by the National Heart, Lung, and Blood Institute to help lower blood pressure.
- **Guide to Lowering Blood Pressure with DASH** – Order up to 10 free copies. Booklet contains information on weight loss, physician activity and a week’s worth of sample menus and recipes. **Electronic Version of DASH Guide**
- **Blood Pressure Wallet Card** – Order up to 10 free copies. The card helps patients monitor their blood pressure readings and reminders about medication and lifestyle changes. **Electronic Version of Wallet Card**

**Eat Well Live Well for Healthy Blood Pressure** – A Rochester based community collaborative focused on improving the health of the Rochester region by reducing the impact of high blood pressure in the community.

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Measures Commonly Used by National Organizations

**Annual Serum Creatinine Test:** Percentage of patients aged 18 through 90 years old with a diagnosis of hypertension who had a serum creatinine test done within 12 months. *(PQRS)*

**Blood Pressure Measurement:** Percentage of patient visits for patients aged 18 years and older with a diagnosis of hypertension who have been seen for at least 2 office visits, with blood pressure (BP) recorded. *(Meaningful Use)*

**Complete Lipid Profile:** Percentage of patients aged 18 through 90 years old with a diagnosis of hypertension who received a complete lipid profile within 60 months. *(PQRS)*

**Controlling High Blood Pressure:** 1. Percentage of patients 18-85 years of age who had a diagnosis of hypertension and whose blood pressure was adequately controlled (<140/90mmHg) during the measurement period. *(PQRS/Meaningful Use)* 2. The percentage of members 18–85 years of age who had a diagnosis of hypertension (HTN) and whose BP was adequately controlled during the measurement year based on the following criteria: Members 18–59 years of age whose BP was <140/90 mm Hg. Members 60–85 years of age with a diagnosis of diabetes whose BP was <140/90 mm Hg. Members 60–85 years of age without a diagnosis of diabetes whose BP was <150/90 mm Hg. *(HEDIS 2015)*

**Diabetes Mellitus Screening Test:** Percentage of patients aged 18 through 90 years old with a diagnosis of hypertension who had a diabetes screening test within 36 months. *(PQRS)*

**Dietary and Physical Activity Modifications Appropriately Prescribed:** Percentage of patients aged 18 through 90 years old with a diagnosis of hypertension who received dietary and physical activity counseling at least once within 12 months. *(PQRS)*

**Improvement in Blood Pressure:** Percentage of patients aged 18-85 years of age with a diagnosis of hypertension whose blood pressure improved during the measurement period. *(PQRS/Meaningful Use)*

**Urine Protein Test:** Percentage of patients aged 18 through 90 years old with a diagnosis of hypertension who either have chronic kidney disease diagnosis documented or had a urine protein test done within 36 months. *(PQRS)*

**Use of Aspirin or Other Antithrombotic Therapy:** Percentage of patients aged 30 through 90 years old with a diagnosis of hypertension and are eligible for aspirin or other antithrombotic therapy who were prescribed aspirin or other antithrombotic therapy. *(PQRS)*

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References

Centers for Medicare & Medicaid Services (CMS) Meaningful Use Quality Measure. (A set of standards defined by the CMS Incentive Programs that governs the use of electronic health records and allows eligible providers to earn incentive payments by meeting specific criteria.) Available from: http://www.cms.gov/Regulations-and-Guidance/Legislation/EHRIncentivePrograms/index.html?redirect=/EHRIncentivePrograms/  


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