NEW HYPERTENSION MANAGEMENT GUIDELINES: ACC - ADA - ACP DEBATE

TROY L RANDLE, DO, FACC, FACOI
FINANCIAL DISCLOSURES

• NONE
OBJECTIVES

• Define stages of hypertension
• Utilizing risk adjustment to determine treatment options
• Understand treatment options for hypertension in certain populations
About 1 in 3 U.S. adults—as estimated 68 million—have high blood pressure, which increases the risk for heart disease and stroke, leading causes of death in the United States.
HYPERTENSION

- High Blood Pressure
Aging and Arterial Stiffness
Pathophysiology

Young elastic vessels

Old inelastic vessels

SYSTOLE  DIASOTOLE

STROKE VOLUME

AORTA

RESISTANCE ARTERIOLES

PRESSURE (FLOW)

Increased systolic

Decreased diastolic

HYPERTENSION – THE NUMBERS
# Older Blood Pressure Classification

<table>
<thead>
<tr>
<th>Blood Pressure Category</th>
<th>Systolic mm Hg (upper #)</th>
<th>Diastolic mm Hg (lower #)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Normal</strong></td>
<td>less than 120</td>
<td>and less than 80</td>
</tr>
<tr>
<td><strong>Prehypertension</strong></td>
<td>120 – 139</td>
<td>or 80 – 89</td>
</tr>
<tr>
<td><strong>High Blood Pressure (Hypertension) Stage 1</strong></td>
<td>140 – 159</td>
<td>or 90 – 99</td>
</tr>
<tr>
<td><strong>High Blood Pressure (Hypertension) Stage 2</strong></td>
<td>160 or higher</td>
<td>or 100 or higher</td>
</tr>
<tr>
<td><strong>Hypertensive Crisis</strong></td>
<td>Higher than 180</td>
<td>or Higher than 110</td>
</tr>
</tbody>
</table>

*(Emergency care needed)*
## 2017 BLOOD PRESSURE GUIDELINE CLASSIFICATION

<table>
<thead>
<tr>
<th>BP Category</th>
<th>SBP</th>
<th>DBP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>&lt;120 mm Hg</td>
<td>and &lt;80 mm Hg</td>
</tr>
<tr>
<td>Elevated</td>
<td>120–129 mm Hg</td>
<td>and &lt;80 mm Hg</td>
</tr>
<tr>
<td>Hypertension</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stage 1</td>
<td>130–139 mm Hg</td>
<td>or 80–89 mm Hg</td>
</tr>
<tr>
<td>Stage 2</td>
<td>≥140 mm Hg</td>
<td>or ≥90 mm Hg</td>
</tr>
</tbody>
</table>
AHA GUIDELINES

- Known CAD or ASCVD > 10%
  - Goal BP < 130/30
- ASCVD < 10%
  - Goal BP < 140/90
DETECTION OF WHITE COAT HYPERTENSION OR MASKED HYPERTENSION IN PATIENTS NOT ON DRUG THERAPY

Office BP: ≥130/80 mm Hg but <160/100 mm Hg after 3 mo trial of lifestyle modification and suspected white coat hypertension

Daytime ABPM or HBPM
BP <130/80 mm Hg

Yes

White Coat Hypertension
- Lifestyle modification
- Annual ABPM or HBPM to detect progression (Class IIa)

No

Hypertension
Continue lifestyle modification and start antihypertensive drug therapy (Class IIa)

Office BP: 120–129/<80 mm Hg after 3 mo trial of lifestyle modification and suspected masked hypertension

Daytime ABPM or HBPM
BP ≥130/80 mm Hg

Yes

Masked Hypertension
Continue lifestyle modification and start antihypertensive drug therapy (Class IIa)

No

Elevated BP
- Lifestyle modification
- Annual ABPM or ABPM to detect masked hypertension or progression (Class IIa)

- Elevated BP
- Annual ABPM or ABPM to detect masked hypertension or progression (Class IIa)

- Lifestyle modification
- Annual ABPM or HBPM to detect masked hypertension or progression (Class IIa)
## Ambulatory Blood Pressure Monitoring (ABPM)

<table>
<thead>
<tr>
<th>Normal</th>
<th>Office &lt;130/80 and ABPM &lt;130/80 with night time BP dip of 10-20%</th>
</tr>
</thead>
<tbody>
<tr>
<td>White Coat Hypertension</td>
<td>BP &gt;130/80 in office with normal ABPM</td>
</tr>
<tr>
<td>Masked Hypertension</td>
<td>BP &lt;130/80 in office; High readings on ABPM</td>
</tr>
<tr>
<td>Sustained Hypertension</td>
<td>Office and ABPM high</td>
</tr>
<tr>
<td>Nocturnal Hypertension</td>
<td>Sleep BP &gt; 120/70 mm Hg</td>
</tr>
</tbody>
</table>

Hypertension. 2013; 62: 988-994
RECOMMEND TREATMENT MEDS

- If BP > 20/10 over goal → 2 MEDS
- Nonblack population
  - Thiazide diuretic
  - Calcium-channel blocker
  - ACE-I/ARB
- Black population
  - Thiazide diuretic
  - Calcium-channel blocker
- CKD (>300 mg/day albuminuria)
  - ACE-I/ARB
<table>
<thead>
<tr>
<th>Antihypertensive Medication</th>
<th>Initial Daily Dose, mg</th>
<th>Target Dose in RCTs Reviewed, mg</th>
<th>No. of Doses per Day</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACE inhibitors</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Captopril</td>
<td>50</td>
<td>150-200</td>
<td>2</td>
</tr>
<tr>
<td>Enalapril</td>
<td>5</td>
<td>20</td>
<td>1-2</td>
</tr>
<tr>
<td>Lisinopril</td>
<td>10</td>
<td>40</td>
<td>1</td>
</tr>
<tr>
<td>Angiotensin receptor blockers</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eprosartan</td>
<td>400</td>
<td>600-800</td>
<td>1-2</td>
</tr>
<tr>
<td>Candesartan</td>
<td>4</td>
<td>12-32</td>
<td>1</td>
</tr>
<tr>
<td>Losartan</td>
<td>50</td>
<td>100</td>
<td>1-2</td>
</tr>
<tr>
<td>Valsartan</td>
<td>40-80</td>
<td>160-320</td>
<td>1</td>
</tr>
<tr>
<td>Irbesartan</td>
<td>75</td>
<td>300</td>
<td>1</td>
</tr>
<tr>
<td>ß-Blockers</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Atenolol</td>
<td>25-50</td>
<td>100</td>
<td>1</td>
</tr>
<tr>
<td>Metoprolol</td>
<td>50</td>
<td>100-200</td>
<td>1-2</td>
</tr>
<tr>
<td>Calcium channel blockers</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Amlodipine</td>
<td>2.5</td>
<td>10</td>
<td>1</td>
</tr>
<tr>
<td>Diltiazem extended release</td>
<td>120-180</td>
<td>360</td>
<td>1</td>
</tr>
<tr>
<td>Nitrendipine</td>
<td>10</td>
<td>20</td>
<td>1-2</td>
</tr>
<tr>
<td>Thiazide-type diuretics</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bendroflumethiazide</td>
<td>5</td>
<td>10</td>
<td>1</td>
</tr>
<tr>
<td>Chlorthalidone</td>
<td>12.5</td>
<td>12.5-25</td>
<td>1</td>
</tr>
<tr>
<td>Hydrochlorothiazide</td>
<td>12.5-25</td>
<td>25-100*</td>
<td>1-2</td>
</tr>
<tr>
<td>Indapamide</td>
<td>1.25</td>
<td>1.25-2.5</td>
<td>1</td>
</tr>
</tbody>
</table>

Abbreviations: ACE, angiotensin-converting enzyme; RCT, randomized controlled trial.

*Current recommended evidence-based dose that balances efficacy and safety is 25-50 mg daily.
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).

General population (no diabetes or CKD) → Diabetes or CKD present

- 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 ages
      - Diabetes present
        - No CKD
          - Blood pressure goal SBP <140 mm Hg DBP <90 mm Hg
            - Nonblack
              - Initiate ACEI or ARB, alone or in combination with other drug class.
            - Black
              - Initiate ACEI or ARB, alone or in combination.

Select a drug treatment titration strategy

A. Maximize first medication before adding second or
B. Add second medication before reaching maximum dose of first medication or
C. Start with 2 medication classes separately or as fixed-dose combination.

At goal blood pressure?
- Yes
  - Continue current treatment and monitoring.
- No
  - Reinforce medication and lifestyle adherence.
    - For strategies A and B, add and titrate thiazide-type diuretic or ACEI or ARB or CCB (use medication class not previously selected and avoid combined use of ACEI and ARB).
    - For strategy C, titrate doses of initial medications to maximum.

At goal blood pressure?
- Yes
  - Continue current treatment and monitoring.
- No
  - Reinforce medication and lifestyle adherence.
    - Add and titrate thiazide-type diuretic or ACEI or ARB or CCB (use medication class not previously selected and avoid combined use of ACEI and ARB).

At goal blood pressure?
- Yes
  - Continue current treatment and monitoring.
- No
  - Add additional medication class (eg, β-blocker, aldosterone antagonist, or others) and/or refer to physician with expertise in hypertension management.
SECONDARY HYPERTENSION

- Renal artery stenosis
- Coarctation of the aorta
- Primary aldosteronism
- Pheochromocytoma
- Use of NSAIDS
- Genetics
- Sleep apnea
- Thyroid disease
- Acromegaly
- Drugs/Alcohol
RED FLAGS FOR SECONDARY HYPERTENSION

- **Abdominal bruit**: renal artery stenosis
- **Palps, HA, pallor, perspiration**: pheochromocytoma
- **Obesity, moon face, purple striae**: Cushing’s
- **Abd mass**: polycystic kidney, hydronephrosis
- **Obesity, hypersomnolence**: OSA
- **Agitation, sweating**: cocaine, ethanol/narc w/d
- **Hypokalemia**: hyperaldosteronism
- **Hypercalcemia**: hyperparathyroidism
### TABLE 40–3 Overall Guide to Work-up for Identifiable Causes of Hypertension

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>Initial</th>
<th>Additional</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chronic renal disease</td>
<td>Urinalysis, serum creatinine, renal sonography</td>
<td>Isotopic renography, renal biopsy</td>
</tr>
<tr>
<td>Renovascular disease</td>
<td>Renal sonography</td>
<td>Magnetic resonance or computed tomography (CT) angiography, aortography</td>
</tr>
<tr>
<td></td>
<td>Duplex Doppler sonography</td>
<td></td>
</tr>
<tr>
<td>Coarctation</td>
<td>Blood pressure in legs</td>
<td>Echocardiography, magnetic resonance imaging, or contrast aortography</td>
</tr>
<tr>
<td>Primary aldosteronism</td>
<td>Plasma and urinary potassium, plasma renin</td>
<td>Urinary aldosterone after oral salt load, adrenal CT, adrenal venous</td>
</tr>
<tr>
<td></td>
<td>and aldosterone</td>
<td>sampling</td>
</tr>
<tr>
<td>Cushing syndrome</td>
<td>Morning plasma cortisol after 1 mg</td>
<td>Urinary cortisol after variable doses of dexamethasone, adrenal CT, and</td>
</tr>
<tr>
<td></td>
<td>dexamethasone at bedtime</td>
<td>scintiscans</td>
</tr>
<tr>
<td>Pheochromocytoma</td>
<td>Plasma-free metanephrine</td>
<td>Plasma normetanephrine (basal and after 0.3 mg clonidine)</td>
</tr>
<tr>
<td></td>
<td>Urine metanephrines and catechol</td>
<td>Adrenal CT and scintiscans</td>
</tr>
</tbody>
</table>

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RESISTANT HYPERTENSION

• JNC 7
  • BP >140/90
  • 3 Medications (including diuretic) at max tolerated doses
• AHA
  • Uncontrolled on 3 medications
  • Controlled on 4 medications
CAUSES OF RESISTANT HYPERTENSION

- Compliance
- 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 HTN
TREATMENT OF RESISTANT HYPERTENSION

• 3 STEP APPROACH
• Optimize Diuretic
  • Thiazide
  • Thiazide Like (Chlorthalidone; Metolazone; Indapamide)
  • Loop diuretics
• Optimize ACE-I/ARB and CCB
• Mineralocorticoid Antagonist
  • Spironolactone/Eplerenone (12.5 – 50 mg/day)

JAMA. 2014;311(21):2216-2224
MANAGEMENT OF HYPERTENSION IN PATIENTS WITH ACUTE ICH

Acute (<6 h from symptom onset) spontaneous ICH

SBP 150–220 mm Hg

SBP lowering to <140 mm Hg (Class III:Harm)

SBP >220 mm Hg

SBP lowering with continuous IV infusion and close BP monitoring (Class IIa)
MANAGEMENT OF HYPERTENSION IN PATIENTS WITH ACUTE ISCHEMIC STROKE

Acute (<72 h from symptom onset) ischemic stroke and elevated BP

Patient qualifies for IV thrombolysis therapy

Yes

Lower SBP to <185 mm Hg and DBP <110 mm Hg before initiation of IV thrombolysis (Class I)

And

Maintain BP <180/105 mm Hg for first 24 h after IV thrombolysis (Class I)

No

BP ≤220/110 mm Hg

BP >220/110 mm Hg

Initiating or reinitiating treatment of hypertension within the first 48–72 hours after an acute ischemic stroke is ineffective to prevent death or dependency (Class III: No Benefit)

Lower BP 15% during first 24 h (Class IIb)

For preexisting hypertension, reinitiate antihypertensive drugs after neurological stability (Class IIa)

For preexisting hypertension, reinitiate antihypertensive drugs after neurological stability (Class IIa)
ADDITIONAL CONSIDERATIONS IN ANTIHYPERTENSIVE DRUG CHOICES

• Potential unfavorable effects

  ▪ Thiazide diuretics should be used cautiously in gout or a history of significant hyponatremia.

  ▪ BBs should be generally avoided in patients with asthma, reactive airways disease, or second- or third-degree heart block.

  ▪ ACEIs and ARBs are contraindicated in pregnant women or those likely to become pregnant.

  ▪ ACEIs should not be used in individuals with a history of angioedema.

  ▪ Aldosterone antagonists and potassium-sparing diuretics can cause hyperkalemia.
BENEFITS OF LOWERING BP

<table>
<thead>
<tr>
<th></th>
<th>Average Percent Reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stroke incidence</td>
<td>35–40%</td>
</tr>
<tr>
<td>Myocardial infarction</td>
<td>20–25%</td>
</tr>
<tr>
<td>Heart failure</td>
<td>50%</td>
</tr>
<tr>
<td>Modification</td>
<td>Recommendation</td>
</tr>
<tr>
<td>------------------------------------</td>
<td>-------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Weight reduction</td>
<td>Maintain normal body weight (body mass index 18.5–24.9 kg/m²).</td>
</tr>
<tr>
<td>Adopt DASH eating plan</td>
<td>Consume a diet rich in fruits, vegetables, and lowfat dairy products with a reduced content of saturated and total fat.</td>
</tr>
<tr>
<td>Dietary sodium reduction</td>
<td>Reduce dietary sodium intake to no more than 100 mmol per day (2.4 g sodium or 6 g sodium chloride).</td>
</tr>
<tr>
<td>Physical activity</td>
<td>Engage in regular aerobic physical activity such as brisk walking (at least 30 min per day, most days of the week).</td>
</tr>
<tr>
<td>Moderation of alcohol consumption</td>
<td>Limit consumption to no more than 2 drinks (1 oz or 30 mL ethanol; e.g., 24 oz beer, 10 oz wine, or 3 oz 80-proof whiskey) per day in men and to no more than 1 drink per day in women and lighter weight persons.</td>
</tr>
</tbody>
</table>

DASH, Dietary Approaches to Stop Hypertension.

* For overall cardiovascular risk reduction, stop smoking.

† The effects of implementing these modifications are dose and time dependent, and could be greater for some individuals.
• In adults (general population) greater than 60 years of age:
  • SBP<150, DBP<90
• In adults (general population) less than 60 years of age:
  • SBP<140, DBP<90
• In adults with diabetes or chronic kidney disease:
  • SBP<140, DBP<90
RECOMMENDED TREATMENT MEDS

- Nonblack population
  - Thiazide diuretic
  - Calcium-channel blocker
  - ACE-I/ARB

- Black population
  - Thiazide diuretic
  - Calcium-channel blocker

- CKD
  - ACE-I/ARB
PHARMACOLOGIC TREATMENT

- Heart failure: ACE-I, ARB, diuretics, BB
- Diabetes: ACE-I, ARB, CCB, Thiazide diuretics
- CAD/post-MI: BB, ACE-I, (CCB for intol.)
- Systolic HTN: ACE-I/ARB, diuretic, CCB
- Pregnancy: labetalol, methyldopa, CCB
- Prostate enlargement: alpha blocker
- Renal disease: ACE-I or ARB
AHA/ACC/ASH STATEMENT

- Ischemic systolic HF
  - avoid CCB’s s/a diltiazem/verap.....dihydropyridine CCB’s ok (amlodipine/felodipine)...PRAISE and V-HEFT trials
  - Avoid clonidine
  - Avoid doxazosin (ALLHAT trial)
<table>
<thead>
<tr>
<th>Guideline</th>
<th>Population</th>
<th>Goal BP, mm Hg</th>
<th>Initial Drug Treatment Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014 Hypertension guideline</td>
<td>General ≥60 y</td>
<td>&lt;150/90</td>
<td>Nonblack: thiazide-type diuretic, ACEI, ARB, or CCB; black: thiazide-type diuretic or CCB</td>
</tr>
<tr>
<td></td>
<td>General &lt;60 y</td>
<td>&lt;140/90</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Diabetes</td>
<td>&lt;140/90</td>
<td></td>
</tr>
<tr>
<td></td>
<td>CKD</td>
<td>&lt;140/90</td>
<td></td>
</tr>
<tr>
<td>ESH/ESC 2013³⁷</td>
<td>General nonelderly</td>
<td>&lt;140/90</td>
<td>Diuretic, β-blocker, CCB, ACEI, or ARB</td>
</tr>
<tr>
<td></td>
<td>General elderly &lt;80 y</td>
<td>&lt;150/90</td>
<td></td>
</tr>
<tr>
<td></td>
<td>General ≥80 y</td>
<td>&lt;150/90</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Diabetes</td>
<td>&lt;140/85</td>
<td></td>
</tr>
<tr>
<td></td>
<td>CKD no proteinuria</td>
<td>&lt;140/90</td>
<td></td>
</tr>
<tr>
<td></td>
<td>CKD + proteinuria</td>
<td>&lt;130/90</td>
<td></td>
</tr>
<tr>
<td>CHEP 2013³⁸</td>
<td>General &lt;80 y</td>
<td>&lt;140/90</td>
<td></td>
</tr>
<tr>
<td></td>
<td>General ≥80 y</td>
<td>&lt;150/90</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Diabetes</td>
<td>&lt;130/80</td>
<td></td>
</tr>
<tr>
<td></td>
<td>CKD</td>
<td>&lt;140/90</td>
<td></td>
</tr>
<tr>
<td></td>
<td>CKD no proteinuria</td>
<td>&lt;140/80</td>
<td></td>
</tr>
<tr>
<td></td>
<td>CKD + proteinuria</td>
<td>≤130/80</td>
<td></td>
</tr>
<tr>
<td>ADA 2013³⁹</td>
<td>Diabetes</td>
<td>&lt;140/80</td>
<td></td>
</tr>
<tr>
<td>KDIGO 2012⁴⁰</td>
<td>CKD no proteinuria</td>
<td>≤140/90</td>
<td></td>
</tr>
<tr>
<td></td>
<td>CKD + proteinuria</td>
<td>≤130/80</td>
<td></td>
</tr>
<tr>
<td>NICE 2011⁴¹</td>
<td>General &lt;80 y</td>
<td>&lt;140/90</td>
<td></td>
</tr>
<tr>
<td></td>
<td>General ≥80 y</td>
<td>&lt;150/90</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Black, lower risk</td>
<td>≤135/85</td>
<td></td>
</tr>
<tr>
<td>ISHIB 2010⁴²</td>
<td>Target organ damage or CVD risk</td>
<td>≤130/80</td>
<td></td>
</tr>
</tbody>
</table>

Abbreviations: ADA, American Diabetes Association; ACEI, angiotensin-converting enzyme inhibitor; ARB, angiotensin receptor blocker; CCB, calcium channel blocker; CHEP, Canadian Hypertension Education Program; CKD, chronic kidney disease; CVD, cardiovascular disease; DHPCCB, dihydropriridine calcium channel blocker; ESC, European Society of Cardiology; ESH, European Society of Hypertension; ISHIB, International Society for Hypertension in Blacks; JNC, Joint National Committee; KDIGO, Kidney Disease: Improving Global Outcome; NICE, National Institute for Health and Clinical Excellence.
BP THRESHOLDS FOR AND GOALS OF PHARMACOLOGICAL THERAPY IN PATIENTS WITH HYPERTENSION ACCORDING TO CLINICAL CONDITIONS

<table>
<thead>
<tr>
<th>Clinical Condition(s)</th>
<th>BP Threshold, mm Hg</th>
<th>BP Goal, mm Hg</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>General</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clinical CVD or 10-year ASCVD risk ≥10%</td>
<td>≥130/80</td>
<td>&lt;130/80</td>
</tr>
<tr>
<td>No clinical CVD and 10-year ASCVD risk &lt;10%</td>
<td>≥140/90</td>
<td>&lt;130/80</td>
</tr>
<tr>
<td>Older persons (≥65 years of age; noninstitutionalized, ambulatory, community-living adults)</td>
<td>≥130 (SBP)</td>
<td>&lt;130 (SBP)</td>
</tr>
<tr>
<td><strong>Specific comorbidities</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diabetes mellitus</td>
<td>≥130/80</td>
<td>&lt;130/80</td>
</tr>
<tr>
<td>Chronic kidney disease</td>
<td>≥130/80</td>
<td>&lt;130/80</td>
</tr>
<tr>
<td>Chronic kidney disease after renal transplantation</td>
<td>≥130/80</td>
<td>&lt;130/80</td>
</tr>
<tr>
<td>Heart failure</td>
<td>≥130/80</td>
<td>&lt;130/80</td>
</tr>
<tr>
<td>Stable ischemic heart disease</td>
<td>≥130/80</td>
<td>&lt;130/80</td>
</tr>
<tr>
<td>Secondary stroke prevention</td>
<td>≥140/90</td>
<td>&lt;130/80</td>
</tr>
<tr>
<td>Secondary stroke prevention (lacunar)</td>
<td>≥130/80</td>
<td>&lt;130/80</td>
</tr>
<tr>
<td>Peripheral arterial disease</td>
<td>≥130/80</td>
<td>&lt;130/80</td>
</tr>
</tbody>
</table>
COMPARING BP CONTROL –
JNC 7 TO JNC8

• Atherosclerosis Risk in Communities Study
  • 6088 participants
    • JNC 7 Prevalence: 82%
    • JNC 7 Controlled: 63%
    • JNC 8 Controlled: 79%

• Despite criteria used, >20% still uncontrolled.
  • Therapeutic Inertia
SPRINT TRIAL

• Systolic Blood Pressure Intervention Trial
  • NIH Sponsored Trial
  • Began Fall 2009
  • 9300 Participants aged 50 and over
  • 100 Centers in US and Puerto Rico
  • Excluded pts. with previously known DM, stroke, polycystic kidney disease
SPRINT TRIAL

- Compared CV events of SBP goal of 120mmHg to 140mmHg
- SBP goal of 140
  - 2 meds
- SBP goal of 120
  - 3 meds
- SBP goal of 120:
  - decrease in CV events (MI, HF, stroke) by 1/3
  - Decrease in death by 1/4
ACCORD TRIAL

- **Population**
  - 4,733 participants with T2D aged 40–79 years with prior evidence of CVD or multiple cardiovascular risk factors

- **Intensive**
  - Systolic blood pressure target: <120 mmHg
  - Achieved (mean) systolic/ diastolic: 119.3/64.4 mmHg

- **Standard**
  - Systolic blood pressure target: 130–140 mmHg
  - Achieved (mean) systolic/ diastolic: 133.5/70.5 mmHg

- **Outcomes**
  - No benefit in primary end point: composite of nonfatal MI, nonfatal stroke, and CVD death
  - Stroke risk reduced 41% with intensive control, not sustained through follow-up beyond the period of active treatment
  - Adverse events more common in intensive group, particularly elevated serum creatinine and electrolyte abnormalities

Diabetes Care 2019;42(Suppl. 1):S103–S123 | https://doi.org/10.2337/dc19S010
LR is a 50 year old black male with medical history of diabetes and dyslipidemia. His blood pressure is 160/90. Which agent is best for initial therapy?

A) Lisinopril
B) Amlodipine
C) Losartan
D) Carvedilol
LR is a 50 year old black male with medical history of diabetes and dyslipidemia. His blood pressure is 160/90. Which agent is best for initial therapy?

A) Lisinopril
B) **Amlodipine** (Correct)
C) Losartan
D) Carvedilol
LT is a 34 year old non-black female with a medical history of diabetes and dyslipidemia. Her blood pressure is 160/90. Which agent is best for initial therapy?

A) Lisinopril  
B) Nifedipine  
C) Losartan  
D) Clonidine
LT is a 34 year old non-black female with a medical history of diabetes and dyslipidemia. Her blood pressure is 160/90. Which agent is best for initial therapy?

A) Lisinopril
B) Nifedipine (Correct)
C) Losartan
D) Clonidine
QUESTION #3

TL is a 50 year old black male with a medical history of DM, dyslipidemia, and CKD2. His blood pressure is 160/90. Which agent is best for initial therapy?

A) Lisinopril
B) Amlodipine
C) Atenolol
D) Chlorthalidone
QUESTION #3

TL is a 50 year old black male with a medical history of DM, dyslipidemia, and CKD2. His blood pressure is 160/90. Which agent is best for initial therapy?

A) Lisinopril (Correct)
B) Amlodipine
C) Atenolol
D) Chlorthalidone
QUESTION #4

RT is a 54 year old female with a medical history of DM, dyslipidemia, and tobacco abuse. Her 10 year ASCVD risk is 11%. Which blood pressure prompts initiation of treatment?

A) >120/80
B) >130/80
C) >140/80
D) >140/90
RT is a 54 year old female with a medical history of DM, dyslipidemia, and tobacco abuse. Her 10 year ASCVD risk is 11%. Which blood pressure prompts initiation of treatment?

A) >120/80
B) >130/80 (Correct)
C) >140/80
D) >140/90