Hypertension Treatment: Current Guidelines and Future Directions

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Federally funded program to produce hypertension guidelines
- Latest iteration was JNC 7 published in 2003

NHLBI announced in June 2013 that it is withdrawing from guideline development, which would then be performed by "partner organizations"

In August 2013, NHLBI established a "partnership" with AHA and ACC to develop hypertension, cholesterol, and obesity guidelines.
- While the cholesterol and obesity guidelines were released in November 2013, the hypertension guidelines were never developed.

JNC panel wasn’t comfortable with shopping guidelines around for endorsements, so they published their work (unendorsed) in JAMA on-line in December 2013 (JAMA 2014;311:507-520) as the document we now call JNC 8.

Once it became clear that AHA and ACC could not reach an agreement with the JNC panel, the former felt compelled to release some form of updated guideline for hypertension management, leading to an AHA-ACC Scientific Advisory Report released on-line November 15, 2013 (J Am Coll Cardiol 2014;63:1230-1238.)

This document is NOT a guideline, however, but more of a treatment algorithm which doesn’t really differ much from the 2003 JNC-7 recommendations.

Further complicating matters is the release of hypertension guidelines by the American Society of Hypertension & International Society of Hypertension in December 2013 (Available at: http://www.ash-us.org/documents/ASH_ISH-Guidelines_2013.pdf)

2013 HTN Guidelines
Major Change #1: BP Goals

<table>
<thead>
<tr>
<th>JNC-8</th>
<th>ASH/ISH</th>
<th>JNC-7 or ADA*</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 60 yrs. old, no comorbidities</td>
<td>&lt;140/90 mmHg</td>
<td>&lt;140/90 mmHg</td>
</tr>
<tr>
<td>60-79 yrs. old, no comorbidities</td>
<td>&lt;150/90 mmHg</td>
<td>&lt;140/90 mmHg</td>
</tr>
<tr>
<td>≥ 80 yrs. old, no comorbidities</td>
<td>&lt;150/90 mmHg</td>
<td>&lt;150/90 mmHg</td>
</tr>
<tr>
<td>Kidney disease</td>
<td>&lt;140/90 mmHg</td>
<td>&lt;140/90 mmHg</td>
</tr>
<tr>
<td>Diabetes</td>
<td>&lt;140/90 mmHg</td>
<td>&lt;140/90 mmHg</td>
</tr>
</tbody>
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“A consensus means that everyone agrees to say collectively what no one believes individually.”
- Abba Eban, Israeli diplomat and politician

2013 HTN Guidelines
Major Change #2: Drug of choice for treating uncomplicated HTN

<table>
<thead>
<tr>
<th>JNC-8</th>
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<th>JNC-7</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 60 yrs. old</td>
<td>Thiazide, CCB, or ACEI/ARB</td>
<td>Thiazide</td>
</tr>
<tr>
<td>≥ 60 yrs. old</td>
<td>Thiazide, CCB, or ACEI/ARB</td>
<td>Thiazide</td>
</tr>
</tbody>
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2013 HTN Guidelines
Major Change #3: Drug of choice for treating HTN in a patient with diabetes (and no kidney disease)

<table>
<thead>
<tr>
<th>JNC-8</th>
<th>ASH/ISH</th>
<th>JNC-7</th>
<th>ADA 2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-African-American</td>
<td>Thiazide, CCB, or ACEI/ARB</td>
<td>ACEI/ARB</td>
<td>ACEI/ARB</td>
</tr>
<tr>
<td>African-American</td>
<td>Thiazide or CCB</td>
<td>ACEI/ARB or Thiazide</td>
<td>ACEI/ARB</td>
</tr>
</tbody>
</table>

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### 2013 HTN Guidelines

**Major change #3: Drug of choice differs based on race**

- **Stage 1**: SBP > 120 mmHg or DBP > 80 mmHg
- **Stage 2**: SBP > 140 mmHg or DBP > 90 mmHg

#### African American patients
- Start with 1 drug: CCB or thiazide

#### Non-African American patients
- Start with 1 drug: ACEI or ARB
  - < 60 yrs.: ACEI or ARB
  - ≥ 60 yrs.: thiazide or CCB

#### JNC-8 stance: Evidence-based medicine
- Evidence-based medicine
- Other guidelines do not consider medication adverse effects
- Greatest number of side effects is with thiazides, incl. impotence and questionable issue of increasing sudden cardiac death

#### ASH stance:
- JNC report relied almost entirely on RCT results; did not include all available evidence
- Other guidelines do not consider medication adverse effects
- ACEI/ARBs considered the safest

#### ESH stance: Getting BP to goal is what's important, regardless of how one gets there

### SBP goals for elderly

#### JNC–8 perspective

<table>
<thead>
<tr>
<th>Study</th>
<th>Age (yrs.)</th>
<th>Treatment (placebo control)</th>
<th>Mean treatment SBP</th>
<th>Primary Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>SHEP (1991)</td>
<td>≥ 60</td>
<td>Chlorthalidone +/- atenolol</td>
<td>143 mmHg</td>
<td>36% reduction in stroke</td>
</tr>
<tr>
<td>Syst-Eur (1997)</td>
<td>≥ 60</td>
<td>Nitrendipine +/- Enalapril +/- HCTZ</td>
<td>151 mmHg</td>
<td>42% reduction in stroke</td>
</tr>
<tr>
<td>HYVET (2008)</td>
<td>≥ 80</td>
<td>Indapamide + perindopril</td>
<td>144 mmHg</td>
<td>30% stroke reduction</td>
</tr>
</tbody>
</table>

There is no compelling evidence that patients over 60 years old benefit from SBP lowered below 140 mmHg.

### Guideline Discord

- **JNC–8 stance**: Evidence-based medicine
- **ASH stance**:
  - JNC report relied almost entirely on RCT results; did not include all available evidence
  - Other guidelines do not consider medication adverse effects
  - Greatest number of side effects is with thiazides, incl. impotence and questionable issue of increasing sudden cardiac death
  - ACEI/ARBs considered the safest
- **ESH stance**: Getting BP to goal is what’s important, regardless of how one gets there

### SBP goals for elderly

#### ASH/ISH perspective

<table>
<thead>
<tr>
<th>Study</th>
<th>Age (yrs.)</th>
<th>Treatments</th>
<th>Treatment SBP (mean)</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALLHAT (2002)</td>
<td>≥ 55</td>
<td>Chlorthalidone vs. amlopidine vs. lisinopril</td>
<td>134-136 mmHg</td>
<td>In 19,173 patients ≥ 65 yo: Lower risk of HF with thiazide vs. CCB &amp; Lower risk of HF, CVD, CHD with thiazide vs. ACEI</td>
</tr>
<tr>
<td>VALUE (2004)</td>
<td>≥ 50</td>
<td>Valsartan vs. amloidipine</td>
<td>138-139 mmHg</td>
<td>In 9566 patients ≥ 65 yo: No difference between ARB &amp; CCB</td>
</tr>
<tr>
<td>ACCOMPLISH (2008)</td>
<td>≥ 55</td>
<td>Benazepril + amloidipine vs. Benazepril + HCTZ</td>
<td>132 mmHg</td>
<td>In 7,640 patients ≥ 65 yo: 19% reduction in CV events with ACEI+CCB</td>
</tr>
</tbody>
</table>

There is enough evidence to suggest that patients between 60–79 years old benefit from SBP lowered below 140 mmHg.
Initial therapy for patients ≥60

*Uncomplicated HTN*

<table>
<thead>
<tr>
<th>Study</th>
<th>Age (yrs.)</th>
<th>Treatment (placebo control)</th>
<th>% of patients receiving step 1 therapy ONLY</th>
</tr>
</thead>
<tbody>
<tr>
<td>SHEP (1991)</td>
<td>≥ 60</td>
<td>Step 1: Chlorthalidone</td>
<td>46%</td>
</tr>
<tr>
<td>Syst-Eur (1997)</td>
<td>≥ 60</td>
<td>Step 1: Nitrendipine, Step 2: Enalapril, Step 3: HCTZ</td>
<td>46%</td>
</tr>
<tr>
<td>HYVET (2008)</td>
<td>≥ 80</td>
<td>Step 1: Indapamide, Step 2: Perindopril</td>
<td>26%</td>
</tr>
</tbody>
</table>

While most antihypertensive trials in the elderly utilized thiazide and CCB–based initial regimens, ACEIs were frequently used as add on therapy.

Antihypertensive Efficacy of HCTZ monotherapy as assessed by 24–hr ABPM

HCTZ dose 12.5–25 mg; p < 0.001 vs. other antihypertensives.

N = number of studies

Not All Thiazides Are Equal

25 mg HCTZ = 8.0 mg chlorthalidone = 1.5 mg bendroflumethiazide

Chlorthalidone vs. HCTZ

Office BP measurements

Chlorthalidone vs. HCTZ

Relative risk of CV Events

Not All Thiazides Are Equal

Thiazides

Balancing Risks and benefits

25 mg HCTZ = 8.0 mg chlorthalidone = 1.5 mg bendroflumethiazide

Hypertension 2012:59:1104-1109.
The Pharmacist's Role in the CONTROL of Hypertension

Joe R. Anderson, PharmD, PhC, BCPS
Associate Professor, University of New Mexico College of Pharmacy and School of Medicine

Consequences of HTN

- 70 million adults in the USA have HTN
- 1 in 5 adults are unaware that they have HTN
- Responsible for 360,000 deaths per year
- 1,000 deaths per day!
- Indirect and direct costs estimated $46 Billion

Prevalence and Control of HTN

Control of HTN

Based on Gender & Age

Based on Gender & Race/Ethnicity


Pharmacist’s Potential Role

- Identify individuals with hypertension (controlled & uncontrolled)
- Screenings
- Counsel/Educate regarding risks of HTN and benefits of treatment
- Counsel/Educate regarding lifestyle modifications and medications
- Review current treatment for appropriateness
- Encourage self-monitoring of blood pressure (SMBP)
- Follow-up with patient
- Review BP readings
- Assess adherence to medication and lifestyle modifications
- Follow-up with patient’s primary care provider when necessary
- If PhC, develop protocol to manage HTN

Evidence of Pharmacist Benefit

- Santschi V, et al. Meta-analysis of Randomized Controlled Trials (J Am Heart Assoc 2014;3:e000718.)
  - Included 39 RCTs with 14,224 patients
  - Compared with usual care, RPh interventions reduced SBP by -7.6mmHg (95% CI: -9.0 to -6.3mmHg) and DBP by -3.9mmHg (95% CI: -5.1 to -2.8mmHg).
  - RPh interventions: patient education, feedback to MD, and medication management

  - Included 11 RCTs with 2,240 patients
  - Compared with usual care, Community RPh decreased SBP -6.1mmHg (95% CI: -3.8 to -8.4mmHg; P<0.0001) and DBP decreased -2.5mmHg (95% CI: -1.5 to -3.4mmHg; P<0.0001).
Evidence of Pharmacist Benefit

- Tsuyuki, R. et al. RCT of Effect of Community RPh Prescribing on BP control (Circulation 2015;132:93-100.)
  - 23 communities in Alberta, Canada enrolled 248 pts.
  - 1st EP: % at goal BP at 6 months
  - 58% in RPh group vs 37% in usual care; P=0.02.


Call for Pharmacists Help

- Several organizations and programs have recognized the important role RPhs can play in improving control of HTN
  - US Department of Health and Human Services
  - The Center for Disease Control (CDC)
  - Centers for Medicare & Medicaid Services (CMS)
  - The American Heart Association
  - Check. Change Control.
  - Community Preventive Services Task Force
  - The Institute of Medicine

Be one in a Million Hearts®
millionhearts.hhs.gov

Million Hearts®

Goal: Prevent 1 million heart attacks and strokes by 2017

- US Department of Health and Human Services initiative, co-led by:
  - Centers for Disease Control and Prevention (CDC)
  - Centers for Medicare & Medicaid Services (CMS)
- Partners across federal and state agencies and private organizations

The ABCS to Prevent Heart Attacks and Strokes

**Aspirin**
People who have had a heart attack and stroke who are taking aspirin

**Blood pressure**
People with hypertension who have adequately controlled blood pressure

**Cholesterol**
People with high cholesterol who are effectively managed

**Smoking**
People trying to quit smoking who get help

Sources: National Ambulatory Medical Care Survey, National Health and Nutrition Examination Survey

Targets for the ABCS

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<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>Aspirin when appropriate</td>
<td>54%</td>
<td>65%</td>
<td>70%</td>
</tr>
<tr>
<td>Blood pressure control</td>
<td>52%</td>
<td>65%</td>
<td>70%</td>
</tr>
<tr>
<td>Cholesterol management</td>
<td>33%</td>
<td>65%</td>
<td>70%</td>
</tr>
<tr>
<td>Smoking cessation</td>
<td>22%</td>
<td>65%</td>
<td>70%</td>
</tr>
</tbody>
</table>
**Excelling in the ABCS**

**Optimizing care: Care Innovations**

- Team-based care
  - Utilizing full scope of practice
  - Collaborative Drug Therapy Management
- Self-measured BP monitoring with clinical support
- Payment for improved health outcomes from innovative models of care

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**Pharmacists** are a key member of the health care team for people with chronic conditions such as hypertension!

- Start a relationship – get to know your patients
- Talk about their medications
- Discuss a plan for patients to regularly monitor BP
- Educate patients about helpful lifestyle changes
  - healthy eating, physical activity, tobacco & alcohol use
- Keep it simple but direct

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**Resources**

- Hypertension Treatment Protocols
- Hypertension Control: Action Steps for Employers
- Hypertension Control Champions
- Self-Measured Blood Pressure Monitoring Guide
- Grand Rounds
  - Million Hearts® Grand Rounds
  - Detect, Connect, and Control
- Cardiovascular Health: Action Steps for Employers
  - Million Hearts® E-update
  - Spanish language website
- 100 Congregations for Million Hearts®
  - Team up, Pressure down program
  - Visit [http://millionhearts.hhs.gov/](http://millionhearts.hhs.gov/) to find other useful Million Hearts® resources.

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**NM DOH Contact Information**

- Bambi Bevill MPH, CHES
  - Heart Disease and Stroke Prevention Coordinator,
  - Office - 505-383-0158
  - Email: bambi.bevill@state.nm.us
- Jennifer Marberry, MS, CHES
  - Heart Disease and Stroke Prevention Health Educator,
  - Office - 505-222-8610
  - Email: Jennifer.Marberry@state.nm.us

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**Check. Change Control.**

Our Mission, Our Goal

**Our mission is to build healthier lives, free of cardiovascular diseases and stroke.**

By 2020, our goal is to improve the cardiovascular health of all Americans by 20% while reducing deaths from cardiovascular diseases and stroke by 20%.
Introducing...

**Check. Change. Control.**

A blood pressure management program to help build healthier lives free of cardiovascular disease and stroke.

For more information log on to WWW.HEART360.ORG/NEWMEXICO

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Check. Change. Control.

- Participants must register in the www.heart360.org/newmexico or unique URL if applicable.
- Participants must check and enter their BP reading and weight, twice a month x 4 months into Heart360.org (the expectation is that they should check and enter it weekly to ensure that they will meet the status of complete).
- Option to host a monthly health education session done at each site for example: physical activity class, cooking demonstration, diabetes education, etc.,

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Heart360: Patient Dashboard

- My Life Check
- Your Heart Score
- Blood Pressure
- Healthy Diet
- Physical Activity
- Smoking Status

You're doing well, but consider all the aspects of your behaviors that lead to good health. Make adjustments to strengthen your position.

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Heart360: Provider Dashboard

- Patients
- Meds
- MyLifeCheck
- MyLifeCheck

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**Pharmacist-led SMBP Program**

- Kaiser Permanente Colorado
- Randomized 348 pts with uncontrolled HTN to UC or RPh-led HBPM group utilizing Heart360 web application
  - https://www.heart360.org
- Primary outcome BP control at 6 months
- BP control improved as well as greater decrease in SBP and DBP in RPh-led group

Summary

- In order to improve their patient’s degree of BP control, the pharmacist should:
  - Identify the appropriate BP goal based on patient’s age and comorbid conditions
  - Determine appropriate initial pharmacologic therapy
  - Empower the patient to self-monitor BP and follow therapeutic plan
  - Help choose a BP monitor & educate in the proper use
  - Encourage the patient to register with Heart360
  - Follow-up with patient on a routine basis