Hypertension Control: The Pharmacist’s Perspective

Joe R. Anderson, PharmD, PhC, BCPS
Associate Professor of Pharmacy Practice and Administrative Sciences
College of Pharmacy, University of New Mexico
Objectives

• Discuss the current hypertension guidelines as they relate to goals of therapy
• Recognize the importance of proper BP assessment
• Review the role of the pharmacist in team-based management of hypertension
Joint National Committee (JNC)

- 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.
# 2013 HTN Guidelines

## Major Change #1: BP Goals

<table>
<thead>
<tr>
<th>Age Group</th>
<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>
<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>
<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>
<td>&lt;140/90 mmHg</td>
</tr>
<tr>
<td>Kidney disease</td>
<td>&lt;140/90 mmHg</td>
<td>&lt;140/90 mmHg</td>
<td>&lt;130/80 mmHg</td>
</tr>
<tr>
<td>Diabetes</td>
<td>&lt;140/90 mmHg</td>
<td>&lt;140/90 mmHg</td>
<td>&lt;140/80 mmHg*</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>&lt;130/80 mmHg</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>optional goal*</td>
</tr>
</tbody>
</table>
# 2013 HTN Guidelines

*Major change #2: Drug of choice for treating uncomplicated HTN*

<table>
<thead>
<tr>
<th></th>
<th>JNC-8</th>
<th>ASH/ISH</th>
<th>JNC-7</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>&lt; 60 yrs. old</strong></td>
<td>Thiazide, CCB, or ACEI/ARB</td>
<td>ACEI/ARB</td>
<td>Thiazide</td>
</tr>
<tr>
<td><strong>≥ 60 yrs. old</strong></td>
<td>Thiazide, CCB, or ACEI/ARB</td>
<td>Thiazide or CCB</td>
<td>Thiazide</td>
</tr>
</tbody>
</table>
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></th>
<th>JNC-8</th>
<th>ASH/ISH</th>
<th>JNC-7</th>
<th>ADA 2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-African-American</td>
<td>Thiazide, CCB, or ACEI/ARB</td>
<td>ACEI/ARB</td>
<td>ACEI/ARB or Thiazide</td>
<td>ACEI/ARB</td>
</tr>
<tr>
<td>African - American</td>
<td>Thiazide or CCB</td>
<td>ACEI/ARB or Thiazide or CCB</td>
<td>ACEI/ARB or Thiazide</td>
<td>ACEI/ARB</td>
</tr>
</tbody>
</table>
Uncomplicated HTN

- Stage 1
  - African-American patients
    - Start with 1 drug: CCB or thiazide
  - non-African American patients
    - Start with 1 drug:
      - ASH: < 60 yrs. old: ACEI or ARB
      - > 60 yrs. old: thiazide or CCB
      - JNC-8: ACEI/ARB, CCB or thiazide

- Stage 2 or SBP >20 mmHg above goal or DBP > 10 mm Hg above goal
  - Start with 2 drugs:
    - CCB or thiazide + ACEI or ARB

If Not at BP goal:
- Increase dosage
- or
- Add a drug from one of the classes not previously selected above; may use ACEI or ARB at this time for African-American patients
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
Guideline Discord
• Await results of The Systolic Blood Pressure Intervention Trial (SPRINT)
  – 9,250 participants aged ≥ 50 years with SBP ≥130 mm Hg and at least one additional CVD risk factor.
  – Randomized to target SBP goals of <120 or <140 mm Hg
  – Primary endpoint: first occurrence of a MI, acute coronary syndrome (ACS), stroke, HF, or CVD death
  – Expected duration 6 years (~ 2018)
Assessing Blood Pressure

• AHA BP monitoring recommendations
  – Remove clothing from upper arm
  – Sit quietly for 5 minutes
  – Legs uncrossed, back and arm supported
  – Mid-point of cuff even with mid-point of sternum
  – Cuff size determined by arm circumference
  – Lower end of cuff 2-3 cm above antecubital fossa
  – Cuff inflated to 30 mmHg above the point when the radial pulse disappears/ deflated at a rate of 2-3 mmHg/second
  – Bilateral measurement, the higher of the two arms should be used

BP Assessment Study

• To determine difference in BP during triage versus AHA BP methods in HTN patients (n=40) presenting to UNMH IM clinic

• Results
  – No significant difference in mean SBP
  – DBP was significantly lower with the triage method (77.6 mmHg ± 11.9) compared to the AHA method (80.4 mmHg ± 10.5; p=0.02)
  – However, 93% (n=37/40) of patients’ SBP differed by ≥ 5 mmHg or DBP differed by ≥ 2 mmHg
  – Overall, 65% not at goal BP per AHA versus 52% with the triage method (p<0.001)
  – Importantly, these BP differences would have resulted in treatment differences (8 or 9 patients depending on provider)
Errors in BP Assessment

Table 2. Adherence to American Heart Association (AHA) Recommendations for Proper Blood Pressure Measurement for Each Measurement Technique

<table>
<thead>
<tr>
<th>Criterion</th>
<th>AHA Measurement (%)</th>
<th>Triage Measurement (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Legs Uncrossed</td>
<td>100</td>
<td>90</td>
</tr>
<tr>
<td>Feet Flat on Ground</td>
<td>100</td>
<td>52.5</td>
</tr>
<tr>
<td>Back Supported</td>
<td>100</td>
<td>80</td>
</tr>
<tr>
<td>Arm Supported</td>
<td>100</td>
<td>87.5</td>
</tr>
<tr>
<td>Arm at Heart Level</td>
<td>100</td>
<td>55</td>
</tr>
<tr>
<td>Bare Arm</td>
<td>100</td>
<td>7.5</td>
</tr>
<tr>
<td>Sat Quietly x 5 minutes</td>
<td>100</td>
<td>7.5</td>
</tr>
<tr>
<td>Before Measurement</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quiet During Measurement</td>
<td>100</td>
<td>75</td>
</tr>
<tr>
<td>Bilateral Measurement</td>
<td>100</td>
<td>0</td>
</tr>
<tr>
<td>Measurement Used: Right</td>
<td>52.5</td>
<td>85</td>
</tr>
<tr>
<td>Measurement Used: Left</td>
<td>47.5</td>
<td>15</td>
</tr>
<tr>
<td>Correct Cuff Size Used</td>
<td>100</td>
<td>60</td>
</tr>
<tr>
<td>Overcuffed</td>
<td>0</td>
<td>37.5</td>
</tr>
<tr>
<td>Undercuffed</td>
<td>0</td>
<td>2.5</td>
</tr>
</tbody>
</table>

Accuracy in BP measurement

Kaiser Permanente of Southern California

- Created HTN registry
- Standardized BP measurement
- Created internal treatment algorithm
- Embraced multidisciplinary approach including MA’s, RN’s, and RPh’s

“The easy access to nonphysician providers to help manage hypertension has been a cornerstone of the coordinated effort for hypertension control.”

Utilization of Pharmacists to Improve BP Control

• Margolis KL, et al. HealthPartners Med Group
  – Assessed home BP telemonitoring with RPh case management to usual care
  – 450 patients with uncontrolled BP
  – Case management
  • Initial 1 hr visit, phone f/u every 2 wks x until BP sustained x 6 weeks, then every 1 – 2 months x total 12 months
  – Primary outcome: Proportion of patients with controlled BP at 6 and 12 months and 6 months post-intervention

JAMA 2013;310:46-56.
Utilization of Pharmacists to Improve BP Control


Table 2. Composite and Blood Pressure (BP) Control

<table>
<thead>
<tr>
<th></th>
<th>Telemonitoring Intervention</th>
<th></th>
<th>Usual Care</th>
<th></th>
<th>Differential Change From Baseline, % (95% CI)</th>
<th>P Value&lt;sup&gt;a&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No. of Patients</td>
<td>% (95% CI)</td>
<td>No. of Patients</td>
<td>% (95% CI)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Composite BP control</td>
<td>At 6 and 12 mo</td>
<td>113 (57.2 (44.8-68.7)</td>
<td>58 (30.0 (23.2-37.8)</td>
<td>27.2 (13.4-40.0)</td>
<td>.001</td>
<td></td>
</tr>
<tr>
<td></td>
<td>At 6, 12, and 18 mo</td>
<td>96 (50.9 (36.9-64.8))</td>
<td>42 (21.3 (14.4-30.4)</td>
<td>29.6 (13.1-46.0)</td>
<td>.002</td>
<td></td>
</tr>
<tr>
<td>BP control</td>
<td>At 6 mo</td>
<td>148 (71.8 (65.6-77.3)</td>
<td>89 (45.2 (39.2-51.3)</td>
<td>26.6 (19.1-33.1)</td>
<td>&lt;.001</td>
<td></td>
</tr>
<tr>
<td></td>
<td>At 12 mo</td>
<td>141 (71.2 (62.0-78.9)</td>
<td>102 (52.8 (45.4-60.2)</td>
<td>18.4 (7.9-27.0)</td>
<td>.005</td>
<td></td>
</tr>
<tr>
<td></td>
<td>At 18 mo</td>
<td>135 (71.8 (65.0-77.8)</td>
<td>104 (57.1 (51.5-62.6)</td>
<td>14.7 (7.0-21.4)</td>
<td>.003</td>
<td></td>
</tr>
</tbody>
</table>

<sup>a</sup> Study group difference for composite BP control and at each individual time point.
Pharmacist-led Home BP Monitoring 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](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

NM Advanced Pharmacist Practice: Pharmacist Clinician (PhC)

- Pharmacist prescriptive authority under collaborative drug therapy management protocol

- PhC requirements
  - NM Registered Pharmacist (RPh)
  - Completion of BOP-approved 60-hour physical assessment course
  - Completion of direct care preceptorship
    - 150 hours
    - 300 patient contacts
    - Supervised by practitioner with prescriptive authority (physicians, NPs, PAs, or PhCs)
Evidence of PhC Benefit

• Health Centers of Northern New Mexico (HCNNM) now El Centro Family Health
  – As part of a HRSA Clinical Pharmacy Demonstration Project, UNM COP partnered with HCNNM to conduct outcomes study
  – Objective: To document the impact of a PhC in the management of patients enrolled in DM disease state management program (DDSM)
    • Primary Endpoint: change in Hba1c
    • Secondary Endpoints: % of patients at goal for Hba1c, BP, lipids
  – Enrolled 50 patients in a pre/post design of 12 months duration

Evidence of PhC Benefit

• Health Centers of Northern New Mexico (HCNNM) now El Centro Family Health

Role for all Pharmacists: Adherence to BP medication

• Medication adherence to anti-hypertensives is poor
  – Primary non-adherence 29% (J Gen Intern Med 2010;25:284–90.)
  – 50% adherent to therapy after 1 year (Am J Hypertens 1997; 10: 697–704.)

• Reasons for non-adherence are multifactorial
  – Therefore, a successful intervention needs to identify each individual patient’s barriers to adherence
Are Patients Refractory or Non-adherent?

- 208 hypertensive patients with inadequate BP control referred to specialty clinic
- Analyzed urine using HPLC for presence of meds and compared to dose
- Differences in BP calculated for every unit change in differences between detected & prescribed meds
- Every unit difference associated with an increase of 3 and 3.1 mmHg in SBP & DBP, respectively.

Utilization of Pharmacist to Improve BP Control

• Improve medication adherence and utilization
  – Health plans can identify non-adherence from pharmacy claims data (Medication Possession Ratio or MPR)
    • MPR < 80% or perhaps < 50%
  – Refer to RPhs who can work with patient to identify and remove barriers

• Serve as case-manager for patient home BP monitoring program
  – Monitor response to therapy