Hypertension: How New Guidelines Should Change Your Practice?

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Overview of Presentation

- Hypertension Current Landscape
- Do we really need guidelines, are there unanswered questions?
- How Much Should Clinical Practice Change in Response to New Guidelines?
Global Burden of Hypertension
2025 Projection

Year 2000
- 26.4% of world’s adults had hypertension
- A total of 972 million adults
- Highest prevalence in established market economies (eg, North America, Europe)

Year 2025
- 29.2% of world’s adults will have hypertension
- A total of 1.56 billion adults
- 60% increase overall
- developed nations—24% increase
- developing nations—80% increase
- Highest prevalence will be in economically developing continents (eg, Asia, Africa)
- will account for 75% of hypertensive patients

Clinical Epidemiology of Hypertension in the U.S. 1988–2008 by Race / Ethnicity

Aware, %

Treated, %

Controlled / Treated, %

JAMA 2010;303:2043–2050
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Hypertension Detection and Follow-up Program: Mortality Improves With Stepped Care

*P<0.01.

Un-answered Questions in Hypertension

- When should we initiate drug treatment?

- Are some drugs better than others?
  - General population and sub-populations

- How low should we go?
  - General population and sub-populations
Questions Guiding the Evidence Review

• In adults with hypertension, does initiating antihypertensive pharmacologic therapy at specific BP thresholds improve health outcomes? **Goals**

• In adults with hypertension, does treatment with antihypertensive pharmacologic therapy to a specified BP goal lead to improvement in health outcomes? **Targets**

• In adults with hypertension, do various antihypertensive drugs or drug classes differ in comparative benefits and harms on specific health outcomes? **Impacts of drugs**
Recommendation 1

General population aged 60 years or older

Initiate Treatment at:

SBP ≥ 150 mmHg or DBP ≥ 90 mmHg

Goal of Treatment:

SBP < 150 mmHg or DBP < 90 mmHg
HYVET (threshold for initiation of >160 mmHg): the basis for the new 80+ recommendation

Recommendation 3

General population < 60 years

Initiate Treatment at:

SBP > 140 mmHg

Goal of Treatment:

DBP < 140 mmHg
Recommendation 2

General population < 60 years

Initiate Treatment at: DBP > 90 mmHg

Goal of Treatment: DBP < 90 mmHg
Recommendation 4

Population aged 18 years or older with CKD

Initiate Treatment at:

SBP ≥ 140 mmHg
or
DBP ≥ 90 mmHg

Goal of Treatment:

DBP < 140 mmHg
or
DBP < 90 mmHg
Recommendation 5

Population aged 18 years or older with diabetes

Initiate Treatment at:

- SBP $\geq$ 140 mmHg
- DBP $\geq$ 90 mmHg

Goal of Treatment:

- DBP $<$ 140 mmHg
- DBP $<$ 90 mmHg
Systolic Pressures (mean ± 95% CI)

Mean # Meds
- Intensive: 3.2, 3.4, 3.5, 3.4
- Standard: 1.9, 2.1, 2.2, 2.3

Average after 1st year: 133.5 Standard vs. 119.3 Intensive, Delta = 14.2
## Primary & Secondary Outcomes

<table>
<thead>
<tr>
<th></th>
<th>Intensive Events (%/yr)</th>
<th>Standard Events (%/yr)</th>
<th>HR (95% CI)</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary</td>
<td>208 (1.87)</td>
<td>237 (2.09)</td>
<td>0.88 (0.73-1.06)</td>
<td>0.20</td>
</tr>
<tr>
<td>Total Mortality</td>
<td>150 (1.28)</td>
<td>144 (1.19)</td>
<td>1.07 (0.85-1.35)</td>
<td>0.55</td>
</tr>
<tr>
<td>Cardiovascular</td>
<td>60 (0.52)</td>
<td>58 (0.49)</td>
<td>1.06 (0.74-1.52)</td>
<td>0.74</td>
</tr>
<tr>
<td>Deaths</td>
<td>126 (1.13)</td>
<td>146 (1.28)</td>
<td>0.87 (0.68-1.10)</td>
<td>0.25</td>
</tr>
<tr>
<td>Nonfatal MI</td>
<td>34 (0.30)</td>
<td>55 (0.47)</td>
<td>0.63 (0.41-0.96)</td>
<td>0.03</td>
</tr>
<tr>
<td>Nonfatal Stroke</td>
<td>36 (0.32)</td>
<td>62 (0.53)</td>
<td>0.59 (0.39-0.89)</td>
<td>0.01</td>
</tr>
<tr>
<td>Total Stroke</td>
<td>36 (0.32)</td>
<td>62 (0.53)</td>
<td>0.59 (0.39-0.89)</td>
<td>0.01</td>
</tr>
</tbody>
</table>

Also examined Fatal/Nonfatal HF (HR=0.94, p=0.67), a composite of fatal coronary events, nonfatal MI and unstable angina (HR=0.94, p=0.50) and a composite of the primary outcome, revascularization and unstable angina (HR=0.95, p=0.40)
Primary Outcome
Nonfatal MI, Nonfatal Stroke or CVD Death

HR = 0.88
95% CI (0.73-1.06)
Recommendation 6

- In general non-black populations, including those with diabetes

- Initial antihypertensive treatment should include any of the following:
  - A thiazide-type diuretic
  - Calcium channel blocker (CCB)
  - Angiotensin-converting enzyme inhibitor (ACEI) or
  - Angiotensin receptor blocker (ARB)
Recommendation 7

- In general black populations, including those with diabetes:
  - Initial antihypertensive treatment should include:
    - Thiazide-type diuretics
    - CCB
The Problem
Adding Fat Inflames the Fat: Adipose Tissue Angiotensin

Obesity in Normotensive African-American Women
Inflammation and Oxidative Stress

Biomarker Profile of Obesity

- Isoprostanes
- CRP
- Adiponectin

Pemu, Ofili Gibbons 2007
Cumulative Event Rates for the Primary Outcome (Fatal CHD or Nonfatal MI) by ALLHAT Treatment Group

<table>
<thead>
<tr>
<th>ALLHAT Treatment Group</th>
<th>RR (95% CI)</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>A/C</td>
<td>0.98 (0.90-1.07)</td>
<td>0.65</td>
</tr>
<tr>
<td>L/C</td>
<td>0.99 (0.91-1.08)</td>
<td>0.81</td>
</tr>
</tbody>
</table>

Number at Risk:

- **Chlorthalidone**: 15,255 14,477 13,820 13,102 11,362 6,340 2,956 209
- **Amlodipine**: 9,048 8,576 8,218 7,843 6,824 3,870 1,878 215
- **Lisinopril**: 9,054 8,535 8,123 7,711 6,662 3,832 1,770 195
Kaplan Meier for Primary Endpoint

- **Cumulative event rate**
  - HR (95% CI): 0.80 (0.72, 0.90)
  - 20% Risk Reduction
  - Time to 1st CV morbidity/mortality (days)
  - ACEI / HCTZ
  - CCB / ACEI
  - p = 0.0002

**ACC March 08**
Primary Endpoint by subgroup in ACCOMPLISH

- All ITT patient
- Age: <65
- ≥65
- <70
- ≥70
- Sex: Male
- Female
- Race: Black
- Non-Black
- Region: US
- Nordic
- Diabetes at baseline: Yes
- No
- CAD at baseline: Yes
- No
- Baseline GFR <60
- ≥60

ACCOMPLISH CV Outcomes, African Americans versus non-African Americans

Log rank p-value < 0.001

Number at risk
US Non-AA 6738
US AA 1413

Time to 1st Event (Months)
0 6 12 18 24 30 36 42

US Non-AA (816 Events)
US AA (110 Events)
Recommendation 8

- Population aged 18 years or older with CKD and hypertension
  Initial (or add-on) antihypertensive treatment should include an ACEI or ARB to improve kidney outcomes

- This applies to all CKD patients with hypertension regardless of race or diabetes status
Recommendation 9

- If goal BP cannot be reached with 2 drugs:
  - Add and titrate a third drug from the list provided

- Do not use an ACEI and an ARB together in the same patient

- If goal BP cannot be reached using the drugs in recommendation 6 because of contraindication of the need to use more than 3 drugs to reach goal BP; antihypertensive drugs from other classes can be used
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Diagnostic algorithm for hypertension

**Hypertension Visit 1**
BP Measurement, History and Physical examination

**Hypertension Visit 2**
Target Organ Damage or Diabetes or BP ≥ 180/110?

- Yes
  - Diagnosis of HTN
- No
  - BP: 140-179 / 90-109

  - Office BPM
  - ABPM (If available)
  - Home BPM (If available)
Criteria for the diagnosis of hypertension and recommendations for follow-up

Office BP

Hypertension visit 3

- \( \geq 160 \) SBP or \( \geq 100 \) DBP
  - Diagnosis of HTN
- \(< 160 / 100 \)
  - ABPM or HBPM

Hypertension visit 4-5

- \( \geq 140 \) SBP or \( \geq 90 \) DBP
  - Diagnosis of HTN
- \(< 140 / 90 \)
  - Continue to follow-up

ABPM (If available)

Awake BP

- \(< 135/85 \) and 24-hour \(< 130/80 \)
  - Continue to follow-up
- \( \geq 135 \) SBP or \( \geq 85 \) DBP or 24-hour \( \geq 130 \) SBP or \( \geq 80 \) DBP
  - Diagnosis of HTN

Home BPM

- \(< 135/85 \)
  - Repeat Home BPM
- \( \geq 135/85 \)
  - Diagnosis of HTN
  - Continue to follow-up

Patients with high normal blood pressure (office SBP 130-139 and/or DBP 85-89) should be followed annually.
NICE 2011 Hypertension Guidelines’ Treatment Algorithm

Aged <55 years

ACE inhibitor or ARB

ACE inhibitor or ARB + CCB\(^a\)

ACE inhibitor or ARB + CCB + thiazide-like diuretic

ACE inhibitor or ARB + CCB + thiazide-like diuretic\(^b\) + consider further diuretic or \(\alpha\)- or \(\beta\)-blocker\(^c\)

Aged \(\geq 55\) years or black person of African or Caribbean family origin of any age

CCB\(^a\)

NICE = National Institute for Health and Clinical Excellence; ACE = angiotensin-converting enzyme; ARB = angiotensin receptor blocker; CCB = calcium channel blocker; HF = heart failure.

\(^a\)CCB is preferred, but consider a thiazide-like diuretic if CCB is not tolerated, or if the patient has edema, HF, or high risk of HF.

\(^b\)Consider low-dose spironolactone or higher doses of thiazide-like diuretic.

\(^c\)Consider \(\alpha\)- or \(\beta\)-blocker if further diuretic therapy is not tolerated, is contraindicated, or is ineffective.

ESH/ESC 2013 Guidelines
Algorithm for the Treatment of Hypertension

Figure 3 Monotherapy vs. drug combination strategies to achieve target BP. Moving from a less intensive to a more intensive therapeutic strategy should be done whenever BP target is not achieved.

ESH = European Society of Hypertension; ESC = European Society of Cardiology; BP = blood pressure; CV = cardiovascular.

2013 ESH/ESC Guidelines for the management of arterial hypertension: The Task Force for the management of arterial hypertension of the European Society of Hypertension (ESH) and of the European Society of Cardiology (ESC). Eur Heart J first published online June 14, 2013 doi:10.1093/eurheartj/eht151
Conclusion

- Guidelines offer clinicians an analysis of what is known and not known about BP treatment thresholds, goals and drug treatment strategies.

- Provides evidence-based recommendation for the management of high BP.

- Should meet the clinical needs of most patients.

- However, these recommendations are not a substitute for clinical judgment, and decisions must carefully consider and incorporate the clinical characteristics of each individual.
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