The New Cardiovascular Guidelines: What’s All the Controversy?

- Lori H. Dupree, Pharm.D., BCPS
- Clinical Assistant Professor
- UF College of Pharmacy
Disclosure

I do not have a vested interest in or affiliation with any corporate organization offering financial support or grant monies for this continuing education activity, or any affiliation with an organization whose philosophy could potentially bias my presentation.
Accreditation

University of Florida is accredited by the Accreditation Council for Pharmacy Education as a provider of continuing pharmacy education.
Objectives

• Identify guideline expectations in clinical practice

• Review highlights of the cardiovascular guidelines for the treatment of hypertension (JNC 8) and cholesterol (ACC/AHA)

• Analyze guideline controversies and evaluate supporting clinical evidence

• Discuss the clinical implications of the new cardiovascular guidelines on the treatment of hypertension and cholesterol
Hypertension

- Effects **78 million** adults in US
- Lowering BP by **10 mmHg** can reduce risk of cardiovascular & stroke death by **25-40%**

Hyperlipidemia

- Effects **73.5 million** adults in US
- **Twice the risk** of heart disease, the **leading cause of death** for men & women
Guideline Expectations

• What is a guideline?
  – Suggests a safe direction when managing difficult clinical situations
  – Credibility depends on thoroughness of external reviewers and integrity of panel responding to concerns

• Deviations from guidelines less tolerated
  – Performance metrics linked to public reporting and pay-for-performance

JAMA 2014;311:474-476
JNC 7 published by NHLBI

2003

Institute of Medicine report “Clinical Practice Guidelines We Can Trust”

2011

NHLBI announced turning guideline development over to AHA/ACC

June 2013

ASH and ISH published Clinical Practice Guidelines for HTN

Dec 2013

Draft JNC 8 revised after sent to 20 reviewers, 16 fed agencies

2011

JNC 8 published online in JAMA with no affiliation

Dec 2013

NHLBI convened JNC 8 panel

2008
• Questions guiding evidence review
  – Does initiating antihypertensive pharmacologic therapy at specific BP thresholds improve health outcomes?

  – Does treatment with antihypertensive pharmacologic therapy to a specified BP goal lead to improvements in health outcomes?

  – Do various antihypertensive drugs or drug classes differ in comparative benefits and harms on specific health outcomes?

JAMA 2014;311:507-520
JNC 8 Overview

• 6146 articles screened, 126 used (2.05%)
• 9 recommendations
  – 5 approved/graded using systemic evidence review
    • 1 strong grade A
    • 1 split grade A and E
    • 2 moderate grade B
    • 1 split grade B and C
  – 4 based on expert opinion only
# The Differences

<table>
<thead>
<tr>
<th>JNC 7</th>
<th>JNC 8</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Nonsystematic review of literature (included observational studies)</td>
<td>• Evidence from randomized, controlled trials (Institute of Medicine)</td>
</tr>
<tr>
<td>• Included treatment recs/classification/diagnosis</td>
<td>• Limited to 5 of 9 recs which were “expert opinion”</td>
</tr>
<tr>
<td>• Recommended 5th drug class (beta blockers) &amp; thiazides as 1st line therapy</td>
<td>• Recommended 4 types of drug classes</td>
</tr>
<tr>
<td>• Treatment recs for compelling indications (HF, MI, stroke, high CV risk)</td>
<td>• Treatment recs according to race, CKD, DM</td>
</tr>
</tbody>
</table>

JNC 8

Recommendation 1

General population aged ≥ 60 years:
Initiate pharmacologic treatment at systolic blood pressure (SBP) ≥ 150 mmHg or diastolic blood pressure (DBP) ≥ 90 mmHg and
treat to goal SBP < 150 mmHg and goal DBP < 90 mmHg

Strong Recommendation – Grade A

JAMA 2014;311:507-520
JNC 8

Corollary Recommendation

General population aged ≥ 60 years:
Pharmacologic treatment for high BP results in lower achieved SBP (< 140 mmHg) and treatment not associated with adverse effects on health or quality of life, treatment does not need to be adjusted.

JAMA 2014;311:507-520
In the general population < 60 years:
Initiate pharmacologic treatment to lower BP at
DBP $\geq 90$ mmHg and
treat to a goal DBP $< 90$ mmHg

Strong Recommendation – Grade A (ages 30-59 y)
Expert Opinion – Grade E (ages 18-29 y)
# National/International Goals

**General Population > 60 years old**

<table>
<thead>
<tr>
<th>Guideline</th>
<th>Target BP (mmHg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>JNC 8 (2014)</td>
<td>&lt; 150/90</td>
</tr>
<tr>
<td>Canadian Hypertension Ed Program (2013) NICE (2011)</td>
<td>&lt; 80 yo: &lt; 140/90, &gt; 80 yo: &lt; 150/90</td>
</tr>
<tr>
<td>ESH/ESC Guidelines (2013)</td>
<td>&lt; 80 yo: 140-150/90, &lt; 140/90 if tolerated</td>
</tr>
<tr>
<td></td>
<td>&gt; 80 yo: 140-150/90</td>
</tr>
<tr>
<td>ASH/ISH (2014)</td>
<td>≥ 80 yo: &lt; 150/90</td>
</tr>
</tbody>
</table>

JAMA 2014;311:507-520
Patient Scenario

- 70 yo frail patient at risk for falls who is taking 2 antihypertensive meds and BP 148/85

<table>
<thead>
<tr>
<th>Age</th>
<th>Comorbidities</th>
<th>Goal BP 2003</th>
<th>Goal BP 2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt; 60 yo</td>
<td>None</td>
<td>&lt; 140/90</td>
<td>&lt; 150/90</td>
</tr>
</tbody>
</table>

JAMA 2003;289:2560-72
JAMA 2014;311:507-520
## Trial Spotlight

<table>
<thead>
<tr>
<th>Trial</th>
<th>Age (mean)</th>
<th>Goal SBP</th>
<th>Endpoints</th>
<th>Results</th>
</tr>
</thead>
</table>
| JATOS | 65 – 85 (74) | 1) < 140 (strict)  
        |            | 2) 140-160 (mild) | Cerebrovascular Dz  
        |            | Cardiac Dz        | Vascular Dz         |
|       |            |          | Renal Failure | NO difference between strict & mild treatment despite final BP difference after 2 year follow-up |

**Of Note:**
- Baseline drug: dihydropyridine CCB
- Among the exclusions
  - Type 2 DM (FBG >200 or HgA1C ≥ 8%)
  - Renal disease (SCr > 1.5)
- Study limitation: lack of power, Japanese pts

Hypertens Res 2008;31:2115-2127
## Trial Spotlight

<table>
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2) 140-160 (mild) | Cerebrovascular Dz  
Cardiac Dz  
Vascular Dz  
Renal Failure | NO difference |
| VALISH | 70-84 (76) | 1) < 140 (strict)  
2) 140-150 (moderate) | Composite of CV events  
Renal Failure | NO difference between moderate & strict groups although difference in SBP after 3 year f/u |

**Of Note:**
- Baseline drug: ARB
- Among the exclusions
  - Renal disease (SCr > 2)
- Study limitation: lack of power, Japanese pts

Hypertens Res 2008;31:2115-2127  
Hypertension 2010;56:196-202
## Trial Spotlight

<table>
<thead>
<tr>
<th>Trial</th>
<th>Age (mean)</th>
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2) 140-160 (mild) | Cerebrovascular Dz  
Cardiac Dz  
Vascular Dz  
Renal Failure | NO difference |
| VALISH | 70-84 (76) | 1) < 140 (strict)  
2) 140-150 (moderate) | Composite of CV events  
Renal Failure | NO difference |
| HYVET | > 80 (84) | 1) < 150  
(+ DBP < 80) | Fatal or nonfatal stroke | Significant ↓ in risk of death from stroke or from any cause |

**Of Note:**
- Baseline drug: TZ diuretic +/- ACEI
- Among the exclusions
  - Renal disease (SCr > 1.7)

Hypertens Res 2008;31:2115-2127  
Hypertension 2010;56:196-202  
## HYVET

**Table 2. Main Fatal and Nonfatal End Points in the Intention-to-Treat Population.**

<table>
<thead>
<tr>
<th>End Point</th>
<th>Rate per 1000 Patient-Yr (No. of Events)</th>
<th>Unadjusted Hazard Ratio (95% CI)</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Active (no. (%))</td>
<td>Placebo (no. (%))</td>
<td></td>
</tr>
<tr>
<td><strong>Stroke</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fatal or nonfatal</td>
<td>12.4 (51)</td>
<td>17.7 (69)</td>
<td>0.70 (0.49–1.01)</td>
</tr>
<tr>
<td>Death from stroke</td>
<td>6.5 (27)</td>
<td>10.7 (42)</td>
<td>0.61 (0.38–0.99)</td>
</tr>
<tr>
<td><strong>Death</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>From any cause</td>
<td>47.2 (196)</td>
<td>59.6 (235)</td>
<td>0.79 (0.65–0.95)</td>
</tr>
<tr>
<td>From noncardiovascular or unknown causes</td>
<td>23.4 (97)</td>
<td>28.9 (114)</td>
<td>0.81 (0.62–1.06)</td>
</tr>
<tr>
<td>From cardiovascular cause</td>
<td>23.9 (99)</td>
<td>30.7 (121)</td>
<td>0.77 (0.60–1.01)</td>
</tr>
<tr>
<td>From cardiac cause*</td>
<td>6.0 (25)</td>
<td>8.4 (33)</td>
<td>0.71 (0.42–1.19)</td>
</tr>
<tr>
<td>From heart failure</td>
<td>1.5 (6)</td>
<td>3.0 (12)</td>
<td>0.48 (0.18–1.28)</td>
</tr>
<tr>
<td><strong>Fatal or nonfatal</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Any myocardial infarction</td>
<td>2.2 (9)</td>
<td>3.1 (12)</td>
<td>0.72 (0.30–1.70)</td>
</tr>
<tr>
<td>Any heart failure</td>
<td>5.3 (22)</td>
<td>14.8 (57)</td>
<td>0.36 (0.22–0.58)</td>
</tr>
<tr>
<td>Any cardiovascular event†</td>
<td>33.7 (138)</td>
<td>50.6 (193)</td>
<td>0.66 (0.53–0.82)</td>
</tr>
</tbody>
</table>

* Death from cardiac causes was defined as fatal myocardial infarction, fatal heart failure, and sudden death.
† Any cardiovascular event was defined as death from cardiovascular causes or stroke, myocardial infarction, or heart failure.
Annals of Internal Medicine

Evidence Supporting a Systolic Blood Pressure Goal of Less Than 150 mm Hg in Patients Aged 60 Years or Older: The Minority View

Jackson T. Wright, Jr., MD, PhD; Lawrence J. Fine, MD, DrPH; Daniel T. Lackland, PhD; Gbenga Ogedegbe, MD, MPH, MS; and Cheryl R. Dennison Himmelfarb, PhD, RN, ANP

The “2014 Evidence-Based Guideline for the Management of High Blood Pressure in Adults: Report from the Panel Members Appointed to the Eighth Joint National Committee (JNC 8)” recommends several major changes from the JNC 7 report (1, 2). The 2014 guideline is based on a systematic review of randomized, controlled trials (RCTs) by a multidisciplinary panel using a process informed by Institute of Medicine recommendations for guideline development (3). Although there was almost unanimous agreement on nearly all recommendations, a minority of the panel (the authors of this commentary) disagreed with the recommendation to increase the target goal of less than 140 mm Hg, particularly in persons aged 80 years or younger (5–9).

PERSONS AGED 60 YEARS OR OLDER WITH HYPERTENSION AND SBP CONTROLLED TO 140 MM HG OR LOWER

More than half of the 72 million persons with hypertension in the United States are aged 60 years or older (10, 11). Among these individuals, the 2014 guideline recommends the SBP goal of 140 mm Hg or lower only for those

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<tr>
<th>Age</th>
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<th>Goal BP</th>
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<tbody>
<tr>
<td>≥ 60 yo</td>
<td>None</td>
<td>&lt; 150/90</td>
</tr>
<tr>
<td>60-79 yo</td>
<td>None</td>
<td>&lt; 140/90</td>
</tr>
<tr>
<td>≥ 80 yo</td>
<td>None</td>
<td>&lt; 150/90</td>
</tr>
</tbody>
</table>

“Proposed” Changes to Goals

Impact of JNC 8

• 2005-2010 NHANES of non-pregnant adults aged 18 or older

• Treatment-eligible HTN
  – Age 18-59 yr → 20.3% per JNC 7, 19.2% per JNC 8
  – Age 60 yrs or older → 68.9% per JNC 7, 61.2% per JNC 8

• US population
  – 6 million adults no longer classified as needing antihypertensive treatment
  – Almost 13.5 million adults not meeting previous guideline goal would now be considered in reasonable BP range

JAMA 2014;311:1403-1405
Impact of JNC 8

• 2005-2010 NHANES
  – eGFR < 60 ml/min/1.73 m² was prevalent in pts with HTN ≥ 140/90

• Kidney Early Education Program (KEEP)
  – Mean age 69 yrs
    • Hazard ratio for ESRD = 1.72 (1.21-2.45) when SBP ≥ 140
    • Hazard ratio for ESRD = 3.30 (2.51-4.49) when SBP ≥ 150
    • Higher hazard ratio for ESRD with DBP > 90

Retrospective cohort study
• Inclusion
  • Members of Kaiser Permanente
  • > 18 yo HTN on anti-HTN agent(s) & 1 outpt BP measurement
• Exclusion
  • Dialysis, renal TXP, CHF
Sim JJ et al.
Ideal BP for Those Treated with HTN

- 398,419 treated HTN pts
- Mean age = 64 yrs
- 30% DM, 24% CKD
- Nadir BP for best outcome = 137/71 mmHg
Trial Spotlight

2014 Eighth Joint National Committee Panel Recommendation for Blood Pressure Targets Revisited

Results From the INVEST Study

Sripal Bangalore, MD, MHA,* Yan Gong, PhD,† Rhonda M. Cooper-DeHoff, PharmD, MS,‡ Carl J. Pepine, MD,‡ Franz H. Messerli, MD§

• HTN patients with CAD
8,345 Patients in INVEST ≥ 60 years with a baseline systolic BP > 150mmHg

Achieved systolic BP at follow-up

- Systolic BP <140mmHg (n = 4,787)
- Systolic BP 140-<150mmHg (n = 1,747)
- Systolic BP ≥150mmHg (n = 1,820)

Adverse Outcomes

First Occurrence of Death, MI or Stroke, %

- Fatal and Nonfatal Stroke
- CV Mortality

Log-rank p<0.0001

Time to Event, y
• “Tempest in the Teapot”
  – HTN pts ≥ 60 yo with CAD
    • SBP < 140: LOWEST rate of primary outcome, all-cause mortality, CV mortality, total MI, nonfatal MI, total stroke and nonfatal stroke (vs. SBP ≥ 140)
    • SBP 140-150: INCREASE risk for CV mortality, total stroke and nonfatal stroke (vs. SBP < 140)
  – Is lower better?
    • For stroke-related endpoints
    • Nadir BP for lowest event rate: 130-140 mmHg
“**Raising the threshold** for treatment of hypertension in patients 60 years of age or older with coronary artery disease may be **detrimental** to the best interest of patients and the public. ACC and AHA, working with the National Heart, Lung and Blood Institute, are in the process of assembling the writing panel that will evaluate evidence from a variety of sources and provide a comprehensive update of the hypertension guidelines.”

American Heart Association President Elliot Antman, M.D., and American College of Cardiology President Patrick O’Gara, M.D.
<table>
<thead>
<tr>
<th>Recommendation</th>
<th>Grade</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 General population <strong>&lt; 60 years:</strong> Initiate pharmacologic treatment at SBP ≥ 140 mmHg and treat to a goal SBP &lt; 140 mmHg</td>
<td>E</td>
<td></td>
</tr>
<tr>
<td>4 <strong>Chronic Kidney Disease and ≥ 18 years:</strong> Initiate pharmacologic treatment at SBP ≥ 140 mmHg or DBP ≥ 90 mmHg and treat to goal SBP &lt; 140 mmHg and goal DBP &lt; 90 mmHg</td>
<td>E</td>
<td>KDIGO† (2012): &lt; 140/90 if ACR* &lt; 30 &lt; 130/80 if ACR* &gt; 30</td>
</tr>
</tbody>
</table>

† Kidney Disease Improving Global Outcomes

*ACR – albumin/creatinine ratio

JAMA 2014;311:507-520
JNC 8

Recommendation 5

Aged ≥ 18 years with diabetes:
Initiate pharmacologic treatment to lower BP at SBP ≥ 140 mmHg or DBP ≥ 90 mmHg and treat to a goal SBP < 140 mmHg and goal DBP < 90 mmHg

Expert Opinion – Grade E

JAMA 2014;311:507-520
### National/International Goals

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<tr>
<td>ASH/ISH (2014)</td>
<td>&lt; 140/90</td>
</tr>
<tr>
<td>ADA (2015)</td>
<td>&lt; 140/90</td>
</tr>
</tbody>
</table>

**Diabetes Target BP**

JAMA 2014;311:507-520  
Diabetes Care 2015;38(Suppl 1):S1-S94
Trial Spotlight

- **ACCORD BP**
  - 4,733 pts with T2DM (mean age = 62 yrs)
  - Intensive Tx (Goal SBP < 120 mmHg) vs. Standard Tx (Goal SBP < 140 mmHg)
  - Results
    - NO difference in composite outcome of nonfatal MI, nonfatal stroke or cardiovascular death after 4.7 year follow-up
    - Total stroke lower in intensive (0.32%) vs. standard (0.53%) \( [p=0.01] \)
    - Rate of nonfatal stroke lower in intensive (0.30%) vs. standard (0.47%) \( [p=0.03] \)
    - Adverse events more significant with intensive \( [p<0.001] \)

*NEJM 2010;362:1575-85*
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 blocker (ARB)

Moderate Recommendation – Grade B

JAMA 2014;311:507-520
JNC 8

Recommendation 7

In the general black population, including those with diabetes:
Initial antihypertensive treatment should include a thiazide-type diuretic or CCB

Moderate Recommendation – Grade B (black)
Weak Recommendation – Grade C (black with DM)

JAMA 2014;311:507-520
**ALLHAT**

- 33,357 pts 55 yrs and older with at least 1 additional CVD risk factor
- Chlorthalidone vs. amlodipine vs. lisinopril
- Results
  - Black pts: chlorthalidone superior in improving CV, cerebrovascular, HF
  - 51% higher rate of stroke for black pts on ACEI compared to CCB

*JAMA 2002;288:2981-2997*
**Trial Spotlight**

- **ACCOMPLISH**
  - 11,506 pts with HTN, high CV risk (mean age = 68 yrs, 60% DM)
  - Benazepril + amlodipine vs. benazepril + HCTZ
  - Mean BP 130’s/70’s
  - Results:

  ![Graph showing hazard ratios and P values for various outcomes](image)

  - **Composite of death from cardiovascular causes and cardiovascular events**: Hazard Ratio (95% CI) = 0.80 (0.72–0.90), P < 0.001
  - **Death from cardiovascular causes**: Hazard Ratio (95% CI) = 0.80 (0.62–1.03), P = 0.08
  - **Myocardial infarction (fatal or nonfatal)**: Hazard Ratio (95% CI) = 0.78 (0.62–0.99), P = 0.04
  - **Stroke (fatal or nonfatal)**: Hazard Ratio (95% CI) = 0.84 (0.65–1.08), P = 0.17
  - **Hospitalization for unstable angina**: Hazard Ratio (95% CI) = 0.75 (0.50–1.10), P = 0.14
  - **Coronary revascularization procedure**: Hazard Ratio (95% CI) = 0.86 (0.74–1.00), P = 0.05
  - **Resuscitation after sudden cardiac arrest**: Hazard Ratio (95% CI) = 1.75 (0.73–4.17), P = 0.20

NEJM 2008;359:2417-28
Which thiazide?

<table>
<thead>
<tr>
<th>Drug</th>
<th>Onset (hr)</th>
<th>Peak (hr)</th>
<th>Duration (hr)</th>
<th>Elimination</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chlorthalidone</td>
<td>2</td>
<td>2-6</td>
<td>48-72</td>
<td>Urine (50-74%)</td>
</tr>
<tr>
<td>Hydrochlorothiazide</td>
<td>2</td>
<td>4</td>
<td>6-12</td>
<td>Urine (unchg)</td>
</tr>
<tr>
<td>Indapamide</td>
<td>1-2</td>
<td>2-2.5</td>
<td>≤ 36</td>
<td>Urine (~60%)</td>
</tr>
</tbody>
</table>

Chlorthalidone Notes

- Reduce platelet aggregation and vascular permeability
- Stimulate angiogenesis
- Improve oxidative stress, endothelial function and antiplatelet activity
- More effective than HCTZ in reducing BP
- Superiority in reducing CV events

Integr Blood Press Control 2014:30;35-47
Recommendation 8

Aged ≥ 18 years with CKD:
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.

Moderate Recommendation – Grade B

JAMA 2014;311:507-520
JNC 8

Recommendation 9

If goal BP is not reached within a month of treatment:

1) **Increase dose** of initial drug *or add 2<sup>nd</sup> drug* from one of four classes

2) If goal BP cannot be reached with 2 drugs, add and titrate 3<sup>rd</sup> **drug**

3) If goal BP cannot be reached using only the drugs recommended because of contraindication *or need to use more than 3 drugs, use antihypertensive drugs from other classes*

Referral to a **hypertension specialist** may be indicated

**Expert Opinion – Grade E**

*JAMA 2014;311:507-520*
JNC 8: Missing Pieces

- Definition of HTN

- Clinical diagnosis of HTN
  - Ambulatory BP and home BP monitoring
  - White coat HTN

- Special populations
  - Obese, metabolic syndrome, OSA, women, Hispanics
**Lifestyle Modifications\(^3\) (LM)**

<table>
<thead>
<tr>
<th>Modification</th>
<th>Recommendation</th>
<th>Approximate SBP Reduction (Range)(^{**})</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Reduce weight</strong></td>
<td>Maintain normal body weight (body mass index 18.5–24.9 kg/m(^2))</td>
<td>5–20 mm Hg/10 kg</td>
</tr>
<tr>
<td><strong>Adopt DASH(^5)</strong> eating plan</td>
<td>Consume a diet rich in fruits, vegetables, and low-fat dairy products with a reduced content of saturated and total fat</td>
<td>8–14 mm Hg</td>
</tr>
<tr>
<td><strong>Lower sodium intake(^6)</strong></td>
<td>a. Consume no more than 2,400 mg of sodium/day;</td>
<td>2–8 mm Hg</td>
</tr>
<tr>
<td></td>
<td>b. Further reduction of sodium intake to 1,500 mg/day is desirable since it is associated with even greater reduction in BP; and</td>
<td></td>
</tr>
<tr>
<td></td>
<td>c. Reduce intake by at least 1,000 mg/day since that will lower BP, even if the desired daily sodium intake is not achieved</td>
<td></td>
</tr>
<tr>
<td><strong>Physical activity</strong></td>
<td>Engage in regular aerobic physical activity such as brisk walking (at least 30 min per day, most days of the week)</td>
<td>4–9 mm Hg</td>
</tr>
<tr>
<td><strong>Moderation of alcohol consumption</strong></td>
<td>Limit consumption to no more than 2 drinks (e.g., 24 oz beer, 10 oz wine, or 3 oz 80-proof whiskey) per day in most men, and to no more than 1 drink per day in women and lighter weight persons</td>
<td>2–4 mm Hg</td>
</tr>
</tbody>
</table>

\(^{**}\) The effects of implementing these modifications are dose and time dependent, and could be greater for some individuals.
Clinical Application

70 yo frail patient at risk for falls who is taking 2 antihypertensive meds and BP 148/85

58 yo AA patient with HTN, DM and Stage 2 CKD on amlodipine and BP 149/92
KNOW YOUR CHOLESTEROL
Reduce Your Risk of Heart Attack and Stroke

STEP 1
Learn about your risk of heart attack and stroke.
Ask yourself...
Are you overweight? Do you exercise? Do you eat healthy? Do you smoke?
Do you have high blood pressure? Do you have diabetes?
Has anyone in your family had a heart attack or a stroke?

STEP 2
Talk to your healthcare provider.
Ask about your risk for heart disease and stroke.
Get your cholesterol checked.

STEP 3
Once you know your goal, take action!
Know your cholesterol goal.
Follow the diet you and your provider agreed to.
Keep a daily journal of what you eat and how many minutes you exercise.
Follow your provider's advice—if you are on medicine, take it.

STEP 4
Follow up with your provider to see if you're meeting your goals.
Get your cholesterol checked again.
If you eat healthy, exercise more and take your cholesterol medicine, you are less likely to have a heart attack or stroke.

www.learnyourlipids.com
Published October 2014

NLA
NATIONAL LIPID ASSOCIATION
ACC/AHA Cholesterol Guidelines

Clinical ASCVD

Primary elevations of LDL > 190 mg/dL

4 Statin Benefit Groups

40-75 yo with DM
LDL 70-189 mg/dL
NO clinical ASCVD

No clinical ASCVD
No DM
LDL 70-189 mg/dL
10-yr ASCVD risk > 7.5%

J Am Coll Cardiol 2014;63:2889-934
ACC/AHA Cholesterol Guidelines

**Pooled Cohort Equations**

- Developed to facilitate shared decision making between clinicians & patients
- Estimates 10-year ASCVD risk for ages 40-79 years & lifetime ASCVD risk
- Derived from 4 longitudinal community-based epidemiological cohort studies
- Representative of white and African American populations

www.my.americanheart.org
J Am Coll Cardiol 2014;63:2889-934
J Am Coll Cardiol 2014;65:1361-1368
# ACC/AHA Cholesterol Guidelines

## Statin Therapy

<table>
<thead>
<tr>
<th></th>
<th>High-Intensity</th>
<th>Moderate-Intensity</th>
<th>Low-Intensity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Daily Dose ↓ LDL</td>
<td>↓ LDL ~ &gt;50%</td>
<td>↓ LDL ~ 30% to &lt;50%</td>
<td>↓ LDL ~ &lt;30%</td>
</tr>
<tr>
<td>Atorvastatin 40 - 80 mg</td>
<td>Rosuvastatin 20 (40) mg</td>
<td>Atorvastatin 10 (20) mg Pravastatin 10 - 20 mg</td>
<td>Simvastatin 10 mg Lovastatin 20 mg</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Simvastatin 20 - 40 mg Pravastatin 40 (80) mg</td>
<td>Fluvastatin 20 - 40 mg Pitavastatin 1 mg</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lovastatin 40 mg Fluvastatin 40 mg bid</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pitavastatin 2 - 4 mg</td>
<td></td>
</tr>
</tbody>
</table>

*Statins and doses that are FDA-approved by not tested in RCTs are in *italics.*

J Am Coll Cardiol 2014;63:2889-934
### ACC/AHA vs. National Lipid Association (NLA)

<table>
<thead>
<tr>
<th>ACC/AHA</th>
<th>NLA</th>
</tr>
</thead>
<tbody>
<tr>
<td>• RCT with ASCVD outcomes + meta-analyses of RCT</td>
<td>• RCT, meta-analyses &amp; post-hoc analyses of RCT, genetic/metabolic/mechanistic studies</td>
</tr>
<tr>
<td>• Statin Benefit Groups</td>
<td>• ASCVD risk based on clinical evidence and risk factors</td>
</tr>
<tr>
<td>• Initiate moderate- or high-intensity statins</td>
<td>• Initiate ASCVD risk based drug therapy</td>
</tr>
<tr>
<td>• No recommendations for lipid goals</td>
<td>• Lipid goals to assess reduction and enhance adherence</td>
</tr>
<tr>
<td>• Non-statin therapy not recommended in combination, consider if statin-intolerant</td>
<td>• Non-statin therapy with moderate- or high-intensity statin to achieve goals</td>
</tr>
</tbody>
</table>

J Am Coll Cardiol 2014;63:2889-934  
J Clin Lipidol 2014;8:473-488
### Risk Factors for ASCVD

- **Age** (Male ≥ 45 yrs, Female ≥ 55 yrs)
- **Family history of early CHD**
  - < 55 yrs in male 1st degree relative or
  - < 65 yrs in female 1st degree relative
- **Current cigarette smoking**
- **High blood pressure**
  - ≥ 140/90 mmHg or on BP med
- **Low HDL-C**
  - Male < 40 mg/dL, Female < 50 mg/dL

### Criteria for ASCVD Classification

- **Myocardial infarction or other ACS**
- **Coronary or revascularization procedure**
- **Transient ischemic attack**
- **Ischemic stroke**
- **Atherosclerotic peripheral arterial disease**
- **Other**: coronary atherosclerosis, renal atherosclerosis, aortic aneurysm secondary to atherosclerosis, carotid plaque (> 50% stenosis)

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J Clin Lipidol 2014;8:473-488
# Therapy Considerations Based on ASCVD Risk

<table>
<thead>
<tr>
<th>Risk Category</th>
<th>Criteria</th>
<th>Treatment Goal Non-HDL-C mg/dL</th>
<th>Consider Drug Therapy Non-HDL-C mg/dL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>0-1 major ASCVD risk factors; Consider other risk indicators if known</td>
<td>&lt;130</td>
<td>≥190</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&lt;100</td>
<td>≥160</td>
</tr>
<tr>
<td>Moderate</td>
<td>2 major ASCVD risk factors; Consider quantitative risk scoring; Consider other risk indicators</td>
<td>&lt;130</td>
<td>≥160</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&lt;100</td>
<td>≥130</td>
</tr>
<tr>
<td>High</td>
<td>≥3 major ASCVD risk factors; Diabetes mellitus (type 1 or 2) and No evidence of end-organ damage; Chronic kidney disease stage 3B or 4; LDL-C ≥190 mg/dL; Quantitative risk score reaching the high-risk threshold</td>
<td>&lt;130</td>
<td>≥130</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&lt;100</td>
<td>≥100</td>
</tr>
<tr>
<td>Very High</td>
<td>ASCVD; Diabetes mellitus (type 1 or 2) and ≥2 other major ASCVD risk factors and Evidence of end-organ damage</td>
<td>&lt;100</td>
<td>≥100</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&lt;70</td>
<td>≥70</td>
</tr>
</tbody>
</table>

**1st line Drug Therapy:**
- Moderate-intensity or High-intensity statin

J Clin Lipidol 2014;8:473-488
Controversy #1

**LDL-C vs. Non-HDL-C**

- LDL comprises 75% cholesterol carried by lipoprotein particles other than HDL
- Non-HDL-C = Total Cholesterol – HDL cholesterol
- Non-HDL-C represents both LDL and VLDL

**NLA →** Non-HDL-C better primary target than LDL-C & stronger predictor of ASCVD morbidity and mortality

**ACC/AHA →** ø RCTs identified treat-to-goal approach improved ASCVD outcomes

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Controversy #2

Calculating Risk

Framingham Risk Score
- Derived from white population
- Only includes MI and CHD death as end points
- *Underestimates* risk

Pooled Risk Cohort Equations
- Derived from non-Hispanic white & African American population
- Includes nonfatal MI, CHD death or stroke as end points
- *Overestimates* risk

J Am Coll Cardiol 2014;63:2889-934
J Am Coll Cardiol 2014;65:1361-1368
J Clin Lipidol 2014;8:473-488
REGARDS study

- Calibration and discrimination of pooled cohort risk equations
- ASCVD risk *overestimated* in black and white US adults
- ASCVD risk *overestimated less* in population considered for statin initiation

![Graph showing risk assessment](image)

Mean predicted risk, %
- Overall population: 1.4, 3.2, 5.1, 7.0, 9.2, 11.5, 14.5, 18.1, 23.4, 34.4
- Participants without diabetes, with LDL-C of 70 to 189 mg/dL, and not taking statins: 1.1, 2.5, 3.9, 5.6, 7.4, 9.4, 11.8, 14.6, 18.6, 26.3

No. of events
- Overall population: 4, 23, 27, 40, 42, 68, 78, 104, 110, 178
- Participants without diabetes, with LDL-C of 70 to 189 mg/dL, and not taking statins: 4, 6, 16, 18, 25, 28, 36, 38, 60, 107

No. of participants
- Overall population: 1849, 1850, 1850, 1850, 1850, 1850, 1850, 1850, 1850, 1849
- Participants without diabetes, with LDL-C of 70 to 189 mg/dL, and not taking statins: 1099, 1100, 1100, 1100, 1100, 1100, 1100, 1100, 1100, 1099

JAMA 2014;311:1406-1415
Impact of ACC/AHA

• 2005-2010 NHANES of 115 million Americans age 40-75 yrs
  – Eligibility for statin therapy rose from 37.5% to 48.6%
  – Patient population
    • Age 60 years or older
    • Men
    • Without CVD

Can J Cardiol 2015. doi: 10.1016/j.cjca.2014.11.007
Patient Application

New Patients

1) Screening & Risk Assessment
2) Lifestyle intervention
3) Risk/benefit discussion of drug therapy
4) Statin therapy & counsel on 5M’s
5) Lipid panel 4-12 wks after initiation

Patients on Statin

1) Assess current statin use
2) Assess lifestyle interventions
3) Check lipid levels
4) No therapeutic response → increase intensity or dose
5) Lipid panel 4-12 wks after change

J Am Coll Cardiol 2014;63:2889-934
J Clin Lipidol 2014;8:473-488
# Clinical Application

## To treat or **NOT** to treat?

<table>
<thead>
<tr>
<th>Age</th>
<th>Total cholesterol</th>
<th>HDL cholesterol</th>
<th>Systolic BP</th>
<th>Treatment for High BP</th>
<th>Diabetes</th>
<th>Smoker</th>
<th>10-year ASCVD risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>60 AA ♂</td>
<td>170</td>
<td>50</td>
<td>125</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>7.5%</td>
</tr>
<tr>
<td>65 AA ♀</td>
<td>178</td>
<td>50</td>
<td>130</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>7.5%</td>
</tr>
<tr>
<td>60 C ♂</td>
<td>170</td>
<td>47</td>
<td>125</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>7.5%</td>
</tr>
</tbody>
</table>
Critical Next Steps

- Larger RCT to compare different BP thresholds in diverse patient populations

- Test “lower is better” hypothesis when results released of nonstatins

- Further assess statin non-benefit groups (i.e., CKD, HF, elderly)

- Create national consensus group to draft updated comprehensive practice guidelines

- Patients and physicians work together to achieve new goals and identify risks

JAMA 2014;311:474-476
Curr Atheroscler Rep 2015;17:468-476
What Guidelines Mean to You

The **new cardiovascular prevention guidelines** were written based on years of scientific research to develop the best approaches to preventing heart disease and stroke—the leading causes of death in the world. Here's what you need to know about the guidelines, released Nov. 12 by the American Heart Association and American College of Cardiology:

**IT ALL STARTS WITH AN ASSESSMENT OF YOUR RISKS PERFORMED BY YOUR HEALTHCARE PROVIDER**

**DISCUSSIONS WITH YOUR HEALTHCARE PROVIDER WILL HELP YOU UNDERSTAND YOUR RISKS AND OVERALL HEALTH**

**THOSE DISCUSSIONS DRIVE PERSONALIZED TREATMENT FOR EACH PATIENT.**

The guidelines help healthcare providers provide the **best treatment** focused on four important areas:

**ASSESSMENT OF RISK** (for heart disease, stroke and other cardiovascular diseases.)
1. Calculators used to assess your personal risk set stage for discussions with healthcare provider
2. Risks for African-Americans specified for the first time
3. Stroke risks included for the first time

**OBESITY**
1. Team-based treatment
2. Weight-loss strategies based on body mass index
3. Diet, exercise still best bets

**CHOLESTEROL**
1. Overall health status and risks guide treatment
2. “Bad cholesterol number” no longer main factor guiding treatment
3. Decisions for drug treatment based on discussions with healthcare provider

**LIFESTYLE**
1. 40 minutes of exercise 3–4 days a week
2. Eat lots of fruit, veggies
3. Most Americans should reduce sodium intake

For more information, please visit [Heart.org](http://Heart.org)
References

- Ganda OP. Deciphering cholesterol treatment guidelines a clinician’s perspective. JAMA 2015;313:1009-1010.
References

- Peterson ED, Gaziano JM, Greenland P. Recommendations for the treatment of hypertension: what are the right goals and purposes? JAMA 2014;311:474-476.
The New Cardiovascular Guidelines: What’s All the Controversy?

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