Blood Pressure Guidelines: Using Science for Integrated Public Health and Clinical Care Systems

National Forum and ASTHO Webinar Series
April 11, 2014

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Deputy Chief Medical Officer
American Heart Association
2010 Leading Causes of Death in the United States

1. Heart disease
2. Cancer
3. Lower respiratory diseases
4. Stroke and related diseases
5. Accidents
6. Alzheimer’s disease
7. Diabetes
8. Kidney diseases
9. Influenza, pneumonia
10. Suicide
11. Septicemia
12. Chronic liver disease and cirrhosis
13. Hypertension and related renal disease
14. Parkinson’s disease
15. Pneumonitis

CDC
Shorter Lives, Poorer Health

• **Heart disease:** The US death rate from ischemic heart disease is the second highest among peer countries. Americans reach age 50 with a less favorable cardiovascular risk profile than their peers in Europe, and adults over age 50 are more likely to develop and die from cardiovascular disease than are older adults in other high-income countries.

• **Obesity and diabetes:** The US has the highest obesity rate among high-income countries. U.S. adults have among the highest prevalence rates of diabetes (and high plasma glucose levels) among peer countries.
Top 10 risk factors for health loss in 2010 and the number of deaths attributable to each

<table>
<thead>
<tr>
<th>Rank</th>
<th>Risk Factor</th>
<th>Deaths</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Dietary risks</td>
<td>678,282</td>
</tr>
<tr>
<td>2.</td>
<td>Smoking</td>
<td>465,651</td>
</tr>
<tr>
<td>3.</td>
<td>High blood pressure</td>
<td>442,656</td>
</tr>
<tr>
<td>4.</td>
<td>High body mass index</td>
<td>363,991</td>
</tr>
<tr>
<td>5.</td>
<td>Physical inactivity</td>
<td>234,022</td>
</tr>
<tr>
<td>6.</td>
<td>High blood sugar</td>
<td>213,669</td>
</tr>
<tr>
<td>7.</td>
<td>High total cholesterol</td>
<td>158,431</td>
</tr>
<tr>
<td>8.</td>
<td>Ambient air pollution</td>
<td>103,027</td>
</tr>
<tr>
<td>9.</td>
<td>Alcohol use</td>
<td>88,587</td>
</tr>
<tr>
<td>10.</td>
<td>Drug use</td>
<td>25,430</td>
</tr>
</tbody>
</table>

Institute for Health Metrics and Evaluation (IHME), 2013


US Census data (2012)

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Whites</strong></td>
<td>78.1%</td>
</tr>
<tr>
<td>Non Hispanic Whites</td>
<td>63.4%</td>
</tr>
<tr>
<td>Blacks</td>
<td>13.1%</td>
</tr>
<tr>
<td>American Indian/Alaska Natives</td>
<td>1.2%</td>
</tr>
<tr>
<td>Asians</td>
<td>5.0%</td>
</tr>
<tr>
<td>Hawaiian/Pacific Islanders</td>
<td>0.2%</td>
</tr>
<tr>
<td>Hispanic or Latino Origin</td>
<td>16.7%</td>
</tr>
</tbody>
</table>
## Projected Population

<table>
<thead>
<tr>
<th></th>
<th>2000</th>
<th>2010</th>
<th>2020</th>
<th>2030</th>
<th>2040</th>
<th>2050</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total Pop</strong></td>
<td>282 M</td>
<td>309 M</td>
<td>336 M</td>
<td>364 M</td>
<td>392 M</td>
<td>420 M</td>
</tr>
<tr>
<td><strong>White</strong></td>
<td>69.4%</td>
<td>65.1%</td>
<td>61.3%</td>
<td>57.5%</td>
<td>53.7%</td>
<td>50.1%</td>
</tr>
<tr>
<td><strong>Hispanic</strong></td>
<td>12.6%</td>
<td>15.5%</td>
<td>17.8%</td>
<td>20.1%</td>
<td>22.3%</td>
<td>24.4%</td>
</tr>
<tr>
<td><strong>Black</strong></td>
<td>12.7%</td>
<td>13.1%</td>
<td>13.5%</td>
<td>13.9%</td>
<td>14.3%</td>
<td>14.6%</td>
</tr>
<tr>
<td><strong>Asian</strong></td>
<td>3.8%</td>
<td>4.6%</td>
<td>5.4%</td>
<td>6.2%</td>
<td>7.1%</td>
<td>8.0%</td>
</tr>
</tbody>
</table>
Healthy Aging is Dependent on a Lifetime of Healthy Living

– Ideal cardiovascular health (defined as the absence of established risk factors at 50) is associated with very low lifetime risk for CVD and markedly longer survival

– These results should promote efforts aimed at preventing development of risk factors in young individuals

– The higher lifetime risks of CVD and lower survival in those with intermediate or high risk factor burden at 50 years of age should be used to in communicate risks and support intensive preventive therapy

Prediction of Lifetime Risk for Cardiovascular Disease by Risk Factor Burden at 50 Years of Age,
Lloyd-Jones, et al, Circulation 2006;113;791-798
By 2020, to improve the cardiovascular health of all Americans by 20%, while reducing deaths from cardiovascular disease and stroke by 20%.

### AHA 2020 Strategic Impact Goals

**HEALTH BEHAVIORS**
- Smoking
- Diet
- Physical Activity
- Body Weight

**HEALTH FACTORS**
- Glucose
- Cholesterol
- Blood Pressure
# Ideal Cardiovascular Health - AHA

<table>
<thead>
<tr>
<th>LIFE'S SIMPLE 7</th>
<th>POOR</th>
<th>INTERMEDIATE</th>
<th>IDEAL</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Smoking Status</strong></td>
<td>Current Smoker Tried prior 30 days</td>
<td>Former ≤ 12 mos</td>
<td>Never /quit ≥ 12 mos</td>
</tr>
<tr>
<td>Adults &gt;20 years of age</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Children (12–19)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Physical Activity</strong></td>
<td>None</td>
<td>1-149 min/wk mod or 1-74 min/wk vig or 1-149 min/wk mod + vig</td>
<td>150+ min/wk mod or 75+ min/wk vig or 150+ min/wk mod + vig</td>
</tr>
<tr>
<td>Adults &gt; 20 years of age</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Children 12-19 years of age</td>
<td></td>
<td>&gt;0 and &lt;60 min of mod or vig every day</td>
<td>60+ min of mod or vig every day</td>
</tr>
<tr>
<td><strong>Healthy Diet</strong></td>
<td>0-1 components 0-1 components</td>
<td>2-3 components 2-3 components</td>
<td>4-5 components 4-5 components</td>
</tr>
<tr>
<td>Adults &gt;20 years of age</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Children 5-19 years of age</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Healthy Weight</strong></td>
<td>≥30 kg/m$^2$ &gt;95th percentile</td>
<td>25-29.9 kg/m$^2$ 85th-95th percentile</td>
<td>&lt;25 kg/m$^2$ &lt;85th percentile</td>
</tr>
<tr>
<td>Adults &gt; 20 years of age</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Children 2-19 years of age</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Blood Glucose</strong></td>
<td>126 mg/dL or more 126 mg/dL or more</td>
<td>100-125 mg/dL or treated to goal 100-125 mg/dL</td>
<td>Less than 100 mg/dL Less than 100 mg/dL</td>
</tr>
<tr>
<td>Adults &gt;20 years of age</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Children 12-19 years of age</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Cholesterol</strong></td>
<td>≥240 mg/dL ≥200 mg/dL</td>
<td>200-239 mg/dL or treated to goal 170-199 mg/dL</td>
<td>&lt;170 mg/dL</td>
</tr>
<tr>
<td>Adults &gt;20 years of age</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Children 6-19 years of age</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Blood Pressure</strong></td>
<td>SBP ≥140 or DBP ≥90 mm Hg</td>
<td>SBP 120-139 or DBP 80-89 mm Hg or treated to goal</td>
<td>&lt;120/&lt;80 mm Hg</td>
</tr>
<tr>
<td>Adults &gt;20 years of age</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Children 8-19 years of age</td>
<td>&gt;95th percentile</td>
<td>90th-95th percentile or SBP ≥120 or DBP ≥80 mm Hg</td>
<td>&lt;90th percentile</td>
</tr>
</tbody>
</table>
Simple 7™ Heart Health Factors that Reduce Mortality

- No Tobacco use
- Physical activity
- Healthy eating
- Healthy Weight
- Normal Blood pressure
- Normal Cholesterol
- Normal Hemoglobin A1c (normal blood glucose levels)

Age-standardized prevalence estimates of US adults aged ≥20 years meeting different numbers of criteria for ideal cardiovascular health, overall and in selected race subgroups from National Health and Nutrition Examination Survey 2009 to 2010.

Relationship between Social Determinants and Mortality (2000)

- Low education level
- Racial segregation
- Low social support
- Individual poverty
- Income inequality
- Area level poverty

Deaths (1000s)

Improved Blood Pressure Control Associated With a Large-Scale Hypertension Program

Marc G. Jaffe, MD; Grace A. Lee, MD; Joseph D. Young, MD; Stephen Sidney, MD, MPH; Alan S. Go, MD

Million Hearts® 2013 Hypertension Control Challenge Champions

Hypertension

Improved Blood Pressure Control Associated With a Large-Scale Hypertension Program

1. Comprehensive hypertension registry
2. Development and sharing of performance metrics
3. Evidence-based guidelines
4. Medical assistants for blood pressure monitoring
5. Simplified pharmacotherapy – single-pill combination

Hypertension

An Effective Approach to High Blood Pressure Control: A Science Advisory From the American Heart Association, the American College of Cardiology, and the Centers for Disease Control and Prevention

– Alan S. Go, MaryAnn Bauman, Sallyann M. Coleman King, Gregg C. Fonarow, Willie Lawrence, Kim A. Williams and Eduardo Sanchez

Hypertension. published online November 15, 2013;
Hypertension Algorithm

Systolic 140–159 or diastolic 90–99 (Stage 1 hypertension)
- Lifestyle modifications as a trial
- Consider adding thiazide

Recheck and review readings in 3 months

BP at Goal?

NO
- Thiazide for most patients or ACEI, ARB, COX, or combo
- If currently on BP meds, titrate and/or add drug from different class

Recheck and review readings in 2–4 weeks

YES
- BP at Goal?

NO
- Encourage self-monitoring and adherence to meds
- Advise patient to alert critical health issues by noticing BP elevation or side effects
- Continue office visits as clinically appropriate

YES
- Optimize doses/eval of and modifications
- Address adherence, advise on self-monitoring, and request readings from home and other settings
- Consider secondary causes

Consider referral to HTN specialist

Systolic >160 or diastolic >100 (Stage 2 hypertension)
- Two drugs preferred
- Lifestyle modifications and
- Thiazide and ACEI, ARB, or COX
- Or consider ACE and COX

Recheck and review readings in 2–4 weeks

Available for download at: www.heart.org/HBPtoolkit
Community Preventive Services Task Force Recommendations for Cardiovascular Disease (CVD) Prevention and Control

- Clinical decision support systems (Apr 2013)
  - Patient data (from EHR) to inform clinical care
- Reducing out-of-pocket costs for patients with high blood pressure and high cholesterol (Nov 2012)
  - For medications and lifestyle management services
- Team-based care to improve blood pressure control (Apr 2012)
  - True care coordination, for example

thecommunityguide.org
Hypertension

E-care for Heart Wellness: A Feasibility Trial to Decrease Blood Pressure and Cardiovascular Risk

— BB Green, ML Anderson, AJ Cook, S Catz, PA Fishman, JB McClure, RJ Reid

Web-based dietician-led tem care interventions are feasible and resulted in decreased weight, blood pressure, and cardiovascular disease risk

Volunteers serve as Community Health Mentors

Based on Best Practice Models

Innovative Approaches Across Top Markets

Heart360 as central tool for participant engagement and data collection

Multicultural Program Update
More than 15,000 participants recruited for the program

Early analysis shows **BPs trending down** among participants with elevated readings at baseline

Local Community-Based Pilot
ASTHO Million Hearts Learning Collaborative

Funding and technical support for nine states and the District of Columbia (D.C.)

– Quality improvement across sectors [systems approach] to find and control high blood pressure

– Alabama, D.C., Illinois, Maryland, Minnesota, New Hampshire, New York, Ohio, Oklahoma, Vermont

ASTHO, 10/2013.
The Guideline Advantage

Program Model

1. Providers can use several different technology platforms

2. Practices submit collective clinical data to Forward Health Group for The Guideline Advantage

3. Data are processed, analyzed and provided back to the practice via a practice portal

4. Performance is measured, professionals can set measureable goals and chart improvements in performance

www.guidelineadvantage.org
• Relevant AHA Reports, Statements, or Guidelines
  – Heart Disease and Stroke Statistics—2014 Update
  – AHA/ACC/CDC Science Advisory: An Effective Approach to HBP Control
QUESTIONS.