Hypertension Update
What’s New in Prevention

Joshua Wynne, MD, MBA, MPH
Vice President for Health Affairs and Dean, UND SMHS
Disclosure

• I have no relevant conflicts of interest
• I do not receive funding from any company associated with any of the pharmaceutical or other products I will discuss
• I do not receive any commercial funding – period!
Goals

• Discuss the risk factors for developing high blood pressure
• Review its symptoms
• Outline the impact of hypertension
• Review the new HBP guidelines
• Discuss the benefit of treatment
Why High Blood Pressure Matters

- **First heart attack**: About 7 of every 10 people having their first heart attack have high blood pressure.
- **Heart failure**: About 7 of every 10 people with chronic heart failure have high blood pressure.
- **First stroke**: About 8 of every 10 people having their first stroke have high blood pressure.

Source: http://www.cdc.gov/bloodpressure/facts.htm
Why High Blood Pressure Matters

• More than **360,000** deaths in 2013 in the US included high blood pressure as a primary or contributing cause. That is about **1,000 deaths each day**.

Source: [http://www.cdc.gov/bloodpressure/facts.htm](http://www.cdc.gov/bloodpressure/facts.htm) and AHA
High Blood Pressure (HBP)

- Almost a billion people have HBP globally
- Almost half (46%) of US adults have hypertension (32% under the old guidelines)
- Only about half of people with HBP have their condition under good control (61% under old and 47% under new guidelines)
- Hypertension costs the nation $46 billion annually

Source: [http://www.cdc.gov/bloodpressure/facts.htm](http://www.cdc.gov/bloodpressure/facts.htm) and AHA
Common Symptoms With High Blood Pressure
Symptoms That May be Seen With High Blood Pressure

- Headaches
- Shortness of breath, especially with exertion
- Symptoms related to complications
  - Chest discomfort
  - Stroke
  - Kidney failure
<table>
<thead>
<tr>
<th>Age</th>
<th>Men (%)</th>
<th>Women (%)</th>
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<td>6.8</td>
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<td>35-44</td>
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<td>78.5</td>
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<tr>
<td>All</td>
<td>34.1</td>
<td>32.7</td>
</tr>
</tbody>
</table>

Source: http://www.cdc.gov/bloodpressure/facts.htm
Risk Factors for and Causes of HBP

- Genetic predisposition (probably polygenetic for most)
- Life-style
  - Obesity
  - High sodium intake
  - Excessive alcohol consumption
- Medications (NSAIDs, stimulants, decongestants, illicit drugs)
- Secondary causes
  - Endocrine
  - Renal/renovascular
Causes of HBP

• Essential
Prevalence of Hypertension, 2011
U.S. Adults Ages 20 and Older (Percentage)

Data Source: BRFSS - Behavioral Risk Factor Surveillance System; CDC.
Self-report: “Have you ever been told by a doctor, nurse, or other health professional that you have high blood pressure?” Excludes women who reported being told only during pregnancy and respondents who reported they had been told that their blood pressure was borderline high or pre-hypertensive.
Classification of Blood Pressure

- Four new BP categories based on the average of two or more in-office blood pressure readings:
  - Normal: < 120 mm Hg systolic BP (SBP) and < 80 mm Hg diastolic BP (DBP)
  - Elevated: 120-129 mm Hg SBP and < 80 mm Hg DBP
  - Stage 1 Hypertension: 130-139 mm Hg SBP or 80-89 mm Hg DBP
  - Stage 2 Hypertension: ≥ 140 mm Hg SBP or ≥ 90 mm Hg DBP
Prevalence of High Blood Pressure

- Substantially higher prevalence of HBP under the new guideline (46% vs. 32% of adults)
- Some of the additional adults meeting the new definition of HBP will require only nonpharmacological treatment (people with BPs between 130-139 mm Hg SBP or 80-89 mm Hg DBP may respond to only lifestyle changes)
- However, it remains unclear as to the percentage of adults newly classified as hypertensive for whom a medication will be needed
Blood Pressure Goals for HBP

• For adults with confirmed hypertension and known CVD or 10-year ASCVD event risk of 10% or higher, a BP goal of less than 130/80 mm Hg is recommended

• For adults without additional markers of increased CVD risk, a BP goal of less than 130/80 mm Hg may be reasonable

• The totality of the available information provides evidence that a lower BP target is generally better than a higher BP target
Blood Pressure Goals for HBP

- The SBP target recommended in the new guideline (<130 mm Hg) is **higher** than was used in the SPRINT trial (<120 mm Hg)
- More about the SPRINT trial to follow!
• Evaluation
  – Confirm diagnosis with at least two BP measurements on at least two occasions
  – Standard approach – seated, legs uncrossed, back supported, after 5 minute rest, properly-sized cuff
  – Initial laboratory testing – renal, lipid and thyroid tests and an electrocardiogram

Source: Taler, NEJM 378:636-644, 2018
HBP Measurement

• Use self-measured blood pressure monitoring (SMBP) to diagnose and reassess HBP
• SMBP refers to the regular measurement of BP by the patient outside of the clinic setting.
• SMBP can be used to confirm the diagnosis of HBP based on elevated office readings and for titration of BP-lowering medication.
• SMBP can help differentiate between sustained, white coat, and masked hypertension.
HBP Management

• Lifestyle changes
  – Sodium restriction (<1500 mg/day)
  – Exercise
  – Moderation of alcohol intake
  – Enhanced intake of potassium-rich foods
  – Minimize use of NSAIDs
  – Cessation of tobacco use

• Medication
  – Most adults require more than one medication

Source: Taler, NEJM 378:636-644, 2018
Target-organ damage

Brain
- Stroke sequelae
- Multi-infarct dementia

Eye
- Retinopathy including cotton-wool exudates
- Hemorrhage
- Papilledema

Heart
- Diastolic dysfunction
- Left ventricular hypertrophy
- Obstructive cardiomyopathy
- Heart failure with preserved ejection fraction
- Accelerated coronary atherosclerosis
- Myocardial infarction
- Heart failure with reduced ejection fraction

Kidney
- Chronic kidney disease
- Albuminuria
- Reduced GFR
- End-stage kidney failure

Vascular
- Aortic aneurysm — ascending or descending
- Atherosclerotic occlusive disease with limb or organ ischemia
- Arterial or aortic dissection
What Is The Optimal Blood Pressure?

Systolic Blood Pressure Intervention Trial

SPRINT

UNIVERSITY OF NORTH DAKOTA
What Is The Optimal Blood Pressure?

• Study group in the SPRINT trial:
  – Age > 50 (average age 68) at increased CV risk but without DM or CVA
• Target of <140 systolic vs. <120 systolic
• Two drugs on average needed in standard BP group vs. 3 drugs in intensive group
• Study stopped early because of greater benefit in the intensive treatment group
SPRINT Trial Findings

- Composite endpoint lower by 25% in the intensive treatment group
- All-cause mortality lower by 27%
- Cardiovascular mortality lower by 43%
- Heart failure lower by 38%
The Bottom Line

• Don’t assume that “all is well” if your patient doesn’t have any symptoms – we don’t call hypertension the Silent Killer for nothing
• Don’t assume that “White Coat Hypertension” can be ignored
• Until proven otherwise, with the provisos mentioned, remember that “lower is better” for most patients (especially those ≥ 50 years) with high blood pressure
Wynne’s Blood Pressure Goals

• All other things being equal, the lower the better (remembering that this is controversial)
• Extra caution required in the truly elderly, frail, bed-ridden, and patients with multiple co-morbidities (especially prior stroke)
• Assumes that the patient does not have limiting symptoms due to medications
• Assumes that the patient has no biochemical or other signs of deleterious effects of treatment
Questions?