What’s In the New Hypertension Guidelines?

Max C. Reif, MD, FACP
Objectives:

At the end of the presentation, the participant will:

1. Be updated on the current recommendations for diagnosis and treatment of hypertension

2. Be able to make optimal treatment decisions for hypertensive patients

3. Be aware of the comprehensive approach needed to prevent cardiovascular disease
Disclosures:

None
JNC-8: Main Points

Goal blood pressure:  
- <60 years: <140/90 mmHg  
- ≥60 years: <150/90 mmHg

CKD: <140/90 mmHg  
Diabetes: <140/90 mmHg

Therapy:  
- Nonblack: Thiazides, ACEI, ARB or CCB  
- Black: Thiazides, CCB first

CKD: ACEI or ARB first

Do not combine ACEI and ARB. Beta blockers are not first line therapy

Assess treatment effect monthly until goal BP is reached

If goal BP cannot be reached, consider adding other classes of drugs or referral to a hypertension specialist

JAMA 311:507-520, 2014
The SPRINT Trial
Systolic Blood Pressure Intervention Trial

Intensive treatment lowered cardiovascular events by 25%
and all cause mortality by 27% (relative risk)

American College of Cardiology
American Heart Association
American Academy of Physician Assistants
Association of Black Cardiologists
American College of Preventive Medicine
American Geriatric Society
American Society of Hypertension
American Pharmacists Association
American Society for Preventive Cardiology
National Medical Association
Preventive Cardiovascular Nurses Association
1. Classification of Blood Pressure:

Normal: < 120 mmHg SBP and < 80 mmHg DBP

Elevated: 120-129 mmHg SBP and < 80 mmHg DBP

Stage 1 Hypertension: 130-139 mmHg SBP or 80-89 mmHg DBP

Stage 2 Hypertension: ≥ 140 mmHg SBP or ≥ 90 mmHg DBP

SBP = Systolic blood pressure
DBP = Diastolic blood pressure

American College of Cardiology/American Heart Association
Whelton PK et al, JACC, published Nov 13, 2017
2. Prevalence of High Blood Pressure (HBP):

46% of U.S. Adults vs. 36% based on JNC 7 definition.

Most people between 130-139 mmHg SBP or 80-89 mmHg DBP will NOT require medication.
Changes in Systolic & Diastolic BP with Age

![Graph showing changes in systolic and diastolic blood pressure with age.](image)

Lifetime Risk for Developing Hypertension

Residual lifetime risk of developing hypertension among people with BP <140/90, ages 55 to 65 years.

Vasan RS et al. JAMA 287:1003-1010, 2002
3. Treatment of High Blood Pressure:

All patients with blood pressures above normal should be treated with non-pharmacological interventions:

Heart-healthy diet, reducing sodium intake, potassium supplementation, increasing physical activity, limiting alcohol consumption and losing body weight for those who are overweight.

Pharmacological intervention for individuals with stage 1 or 2 hypertension and/or high risk for cardiovascular disease (10-year CVD risk $\geq 10\%$).
4. Blood Pressure Treatment Threshold for People with High Blood Pressure:

For adults with confirmed HBP and no known CVD and a 10-year risk of atherosclerotic cardiovascular disease of less than 10%: BP lowering medication is recommended for BP $\geq 140/90$ mmHg.

For adults with clinical CVD, start medication for BP $\geq 130/80$ mmHg or higher. A target close to 120/80 mmHg is generally better than a higher BP target.

CVD = Cardiovascular disease
American College of Cardiology/American Heart Association
Whelton PK et al, JACC 71:e127-e248, 2018
5. Use Self-measured Blood Pressure Monitoring (SMBP) to Diagnose, Reassess, and Activate Patients with High Blood Pressure:

SMBP refers to the regular measurement of BP by an individual outside the clinic setting.

SMBP can help differentiate between sustained, white coat and masked hypertension.
Checklist for Accurate Blood Pressure Measurement

Prepare the patient
Use proper technique
Take the appropriate measurements
Document
Provide readings to the patient

Use an average of ≥2 readings obtained on ≥2 occasions to estimate the individual’s level of blood pressure

American College of Cardiology/American Heart Association
Whelton PK et al, JACC 71:e127-e248, 2018
Initial Laboratory Tests for Primary Hypertension

Fasting blood glucose
Complete blood count
Lipid profile
Serum creatinine with eGFR
Serum sodium, potassium, calcium
Thyroid-stimulating hormone
Urinalysis
Electrocardiogram

Optional:
Echocardiogram
Uric acid
Urinary albumin to creatinine ratio

American College of Cardiology/American Heart Association
Whelton PK et al, JACC 71:e127-e248, 2018
ACC/AHA ASCVD Risk Calculator

10-year risk of heart disease or stroke

2013 ACC/AHA Guidelines on the Assessment of Cardiovascular Risk
Long Term Results of Weight Loss

Salt: The Creation of a Myth

Endorsed by:

- United States Department of Agriculture
- American Heart Association
- Academy of Nutrition and Dietetics
- American Diabetes Association
Daily Sodium Intake In the Adult U.S. Population: 3.4 gm

Men: 3.9 gm sodium (170 mmol)
Women: 2.9 gm sodium (130 mmol)

Ayala C et al. JAMA 301:1759-1760, 2009
Urinary Sodium and Risk for Cardiovascular Events

ONTARGET and TRANSCEND trials (n=28,880, median follow-up 56 months)
24 h urine sodium extrapolated from one fasting morning urine sample

Composite of CV Death, Stroke, MI and Hospitalization for CHF

Urinary Sodium Excretion and Cardiovascular Events

Prospective population study (n=2,591, no CV disease)
Two 24-hour urine collections for each participant

No difference in all-cause mortality; Low-sodium tertile vs. other two tertiles had significantly more CV events and CV deaths.

Stolarz-Skrzypek K et al. JAMA 305:1777-1785, 2011
The available evidence on associations between sodium intake and direct health outcomes is consistent with population-based efforts to lower excessive dietary sodium intakes.

The evidence on direct health outcomes does NOT support recommendations to lower sodium intake within these subgroups* from 2,300 mg (100 mmol) to or even below 1,500 mg (65 mmol) daily.

(* diabetes, kidney disease, heart disease, hypertension, borderline hypertension, 51 years of age and older, African Americans)
Change in Mean Systolic Blood Pressure per 1 g/day Increase in Sodium Intake

Prospective Urban Rural Epidemiology Study (PURE). *Lancet* 392:496-506, 2018
Incidence of Stroke per 1 g/day Increase in Sodium Intake

Prospective Urban Rural Epidemiology Study (PURE). *Lancet* 392:496-506, 2018

Events per 1000 years

(5.1 gm sodium = 13 gm salt)
Cardiovascular Events or Death per 1 g/day Increase in Sodium Intake

Prospective Urban Rural Epidemiology Study (PURE). *Lancet* 392:496-506, 2018
24-Hour Ambulatory Blood Pressure Monitoring (ABPM)

Recommended Thresholds for ABPM in Adults:

- 24-hour average \( \geq 140/80 \text{ mmHg} \)
- Daytime average \( \geq 135/85 \text{ mmHg} \)
- Nighttime average \( \geq 120/70 \text{ mmHg} \)

The absence of a nocturnal decrease of at least 10% (of the daytime value) is associated with higher cardiovascular mortality.

24-Hour Ambulatory Blood Pressure Monitoring (ABPM)

Recommended Thresholds for ABPM in Adults:

24-hour average \( \geq 130/80 \) mmHg

Daytime average \( \geq 135/85 \) mmHg

Nighttime average \( \geq 120/70 \) mmHg

*Based on observational studies only*

American College of Cardiology/American Heart Association
Whelton PK et al, *JACC* 71:e127-e248, 2018
Principles of Antihypertensive Drug Therapy

Do not delay drug treatment.

Life style changes often do not succeed.

Follow the patient at 6-week intervals until control is achieved.

A six-month period of undertreated hypertension increases cardiovascular morbidity.¹

## Selection of an Initial Antihypertensive Agent

<table>
<thead>
<tr>
<th>Agent</th>
<th>Advantages</th>
<th>Poss. Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thiazides</td>
<td>Black patients, elderly</td>
<td>Gout, lithium therapy, hyponatremia</td>
</tr>
<tr>
<td>ACEI/ARB</td>
<td>Heart failure, post MI DM, proteinuria</td>
<td>Pregnancy, hyperkalemia</td>
</tr>
<tr>
<td>CCB</td>
<td>Black patients, elderly</td>
<td>Avoid non-dihydropyridines</td>
</tr>
<tr>
<td>Beta-blockers</td>
<td>Post MI, heart failure, angina</td>
<td>COPD, peripheral artery disease</td>
</tr>
</tbody>
</table>

ACEI = angiotensin converting enzyme inhibitor; ARB = angiotensin receptor blocker; CCB = calcium channel blocker; MI = myocardial infarction; COPD = chronic obstructive pulmonary disease
CV Mortality 1900-1996

FIGURE 1. Age-adjusted death rates* for total cardiovascular disease, diseases of the heart, coronary heart disease, and stroke,† by year — United States, 1900-1996

Rates are per 100,000 population

CDC: MMWR 48:649-656, 1999
Top Ten Leading Risk Factors for Global Mortality (millions of deaths), 2004

Leading risk factors for global mortality, 2004

- High blood pressure: 7.5
- Tobacco use: 5.1
- High blood glucose: 3.4
- PHYSICAL INACTIVITY: 3.2
- Overweight and obesity: 2.8
- High Cholesterol: 2.6
- Unsafe sex: 2.4
- Alcohol use: 2.3
- Childhood underweight: 2.2
- Indoor smoke from solid fuels: 2.0

World Health Organization, 2009
Classification of Blood Pressure in Adults:

Normal: <120/80 mmHg
Elevated: 120-129/<80 mmHg
Stage 1 Hypertension: 130-139/80-89 mmHg
Stage 2 Hypertension: ≥140/≥90 mmHg

Initial Drug Therapy: ACEI, ARB, CCB (dihydropyridine) and/or thiazide diuretics

Black patients: Start with thiazide or CCB

Patients with CKD: Initial therapy should include ACEI or ARB
Guidelines for Treatment

- \( \geq 120/80 \text{ mmHg} \): Non-pharmacological interventions for everyone
- \( 120-129/<80 \text{ mmHg} \): Drug therapy in special cases
- \( 130-139/80-89 \text{ mmHg} \): Drug therapy for high CVD risk patients
- \( \geq 140/\geq 90 \text{ mmHg} \): Drug therapy for everyone

Adapted from: American College of Cardiology/American Heart Association
Whelton PK et al, JACC 71:e127-e248, 2018
Individualize Therapy!