

# Hypertension in the Elderly

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## Hypertension in the Elderly – Why Does it Matter?

- Aging Population
- Very high prevalence of HTN
- Risk: In older Americans, HTN is a major risk factor for CVD – MI, stroke, CHF – present in roughly 2/3 of new cases. It is also a major risk factor for AFib and CKD.
- In 2009, total direct and indirect costs attributable to HTN were estimated to be \$73.4 billion.

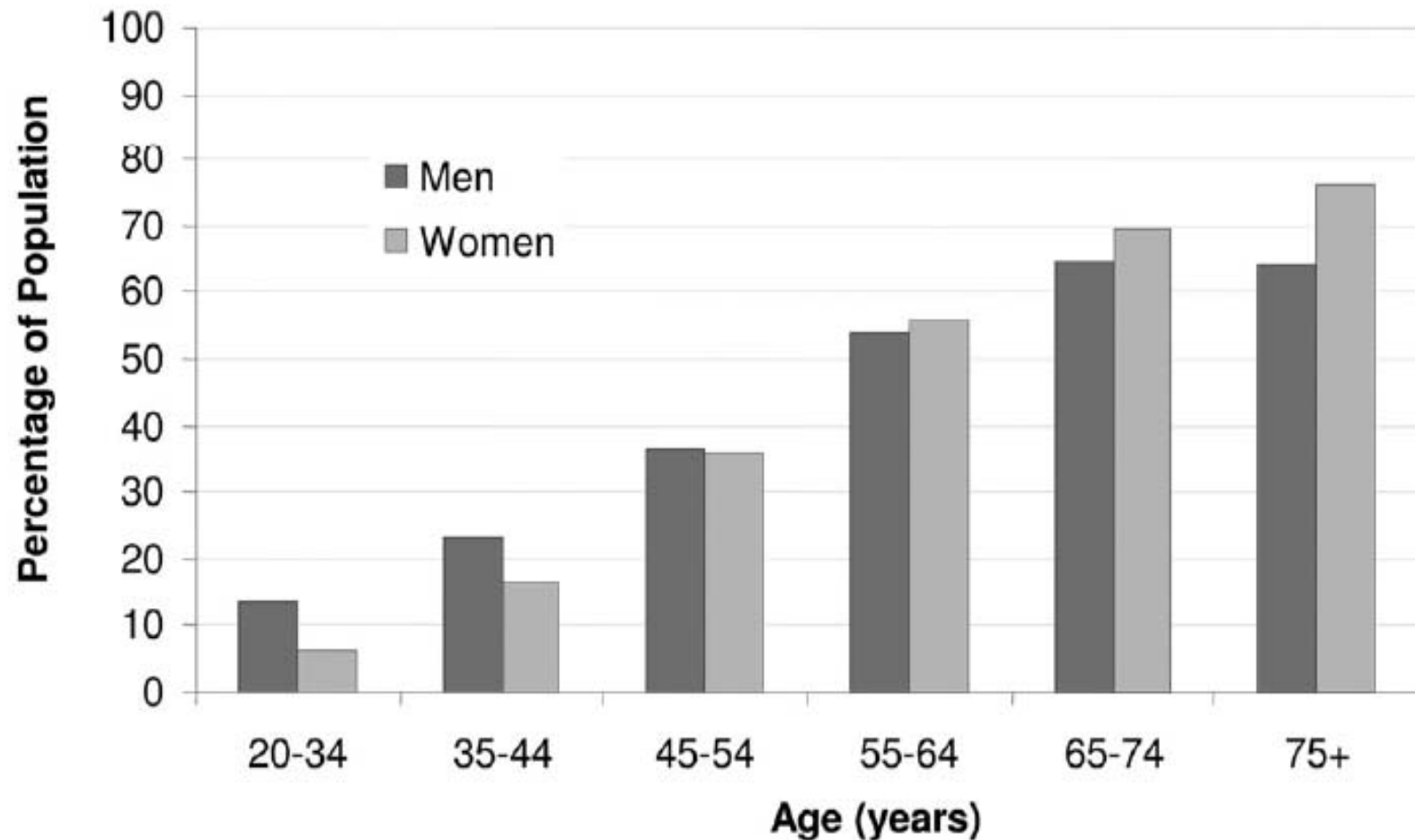
# Aging Population

**Table 3. Population Projections by Selected Age Groups and Sex for the United States: 2010 to 2050 (in 1000 s)**

Population	Year 2010	Year 2030	Year 2050
<b>Both sexes</b>			
≥65 y of age	40 229 (13.0%)	72 092 (19.3%)	88 547 (20.2%)
≥85 y of age	5751 (1.9%)	8745 (2.3%)	19 041 (4.3%)
<b>Total</b>	<b>310 233</b>	<b>373 504</b>	<b>439 010</b>
<b>Men</b>			
≥65 y of age	17 292 (11.3%)	32 294 (17.6%)	39 917 (18.5%)
≥85 y of age	1893 (1.2%)	3284 (1.8%)	7458 (3.5%)
<b>Total</b>	<b>152 753</b>	<b>183 870</b>	<b>215 825</b>
<b>Women</b>			
≥65 y of age	22 937 (14.6%)	39 798 (21.0%)	48 630 (21.8%)
≥85 y of age	3859 (2.5%)	5461 (2.9%)	11 583 (5.2%)
<b>Total</b>	<b>157 479</b>	<b>189 634</b>	<b>223 185</b>

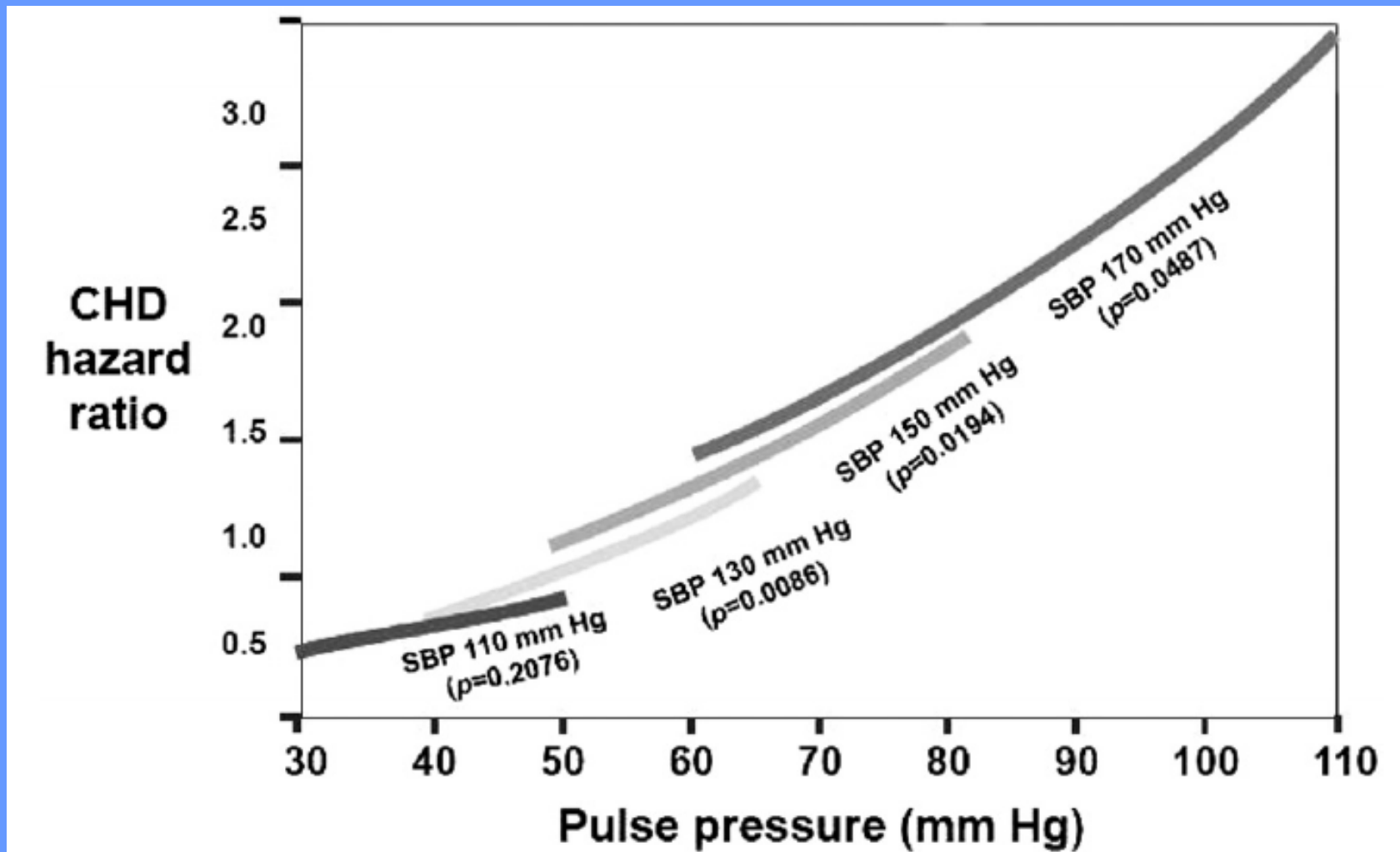
Modified from US Census Bureau.<sup>38</sup>

# Prevalence of Hypertension



**Figure 1.** Prevalence of high blood pressure in adults by age and sex (NHANES: 2005–2006). NHANES indicates The National Health and Nutrition Examination Survey. Modified from Lloyd-Jones et al.<sup>34</sup>

# Blood Pressure and CHD Risk



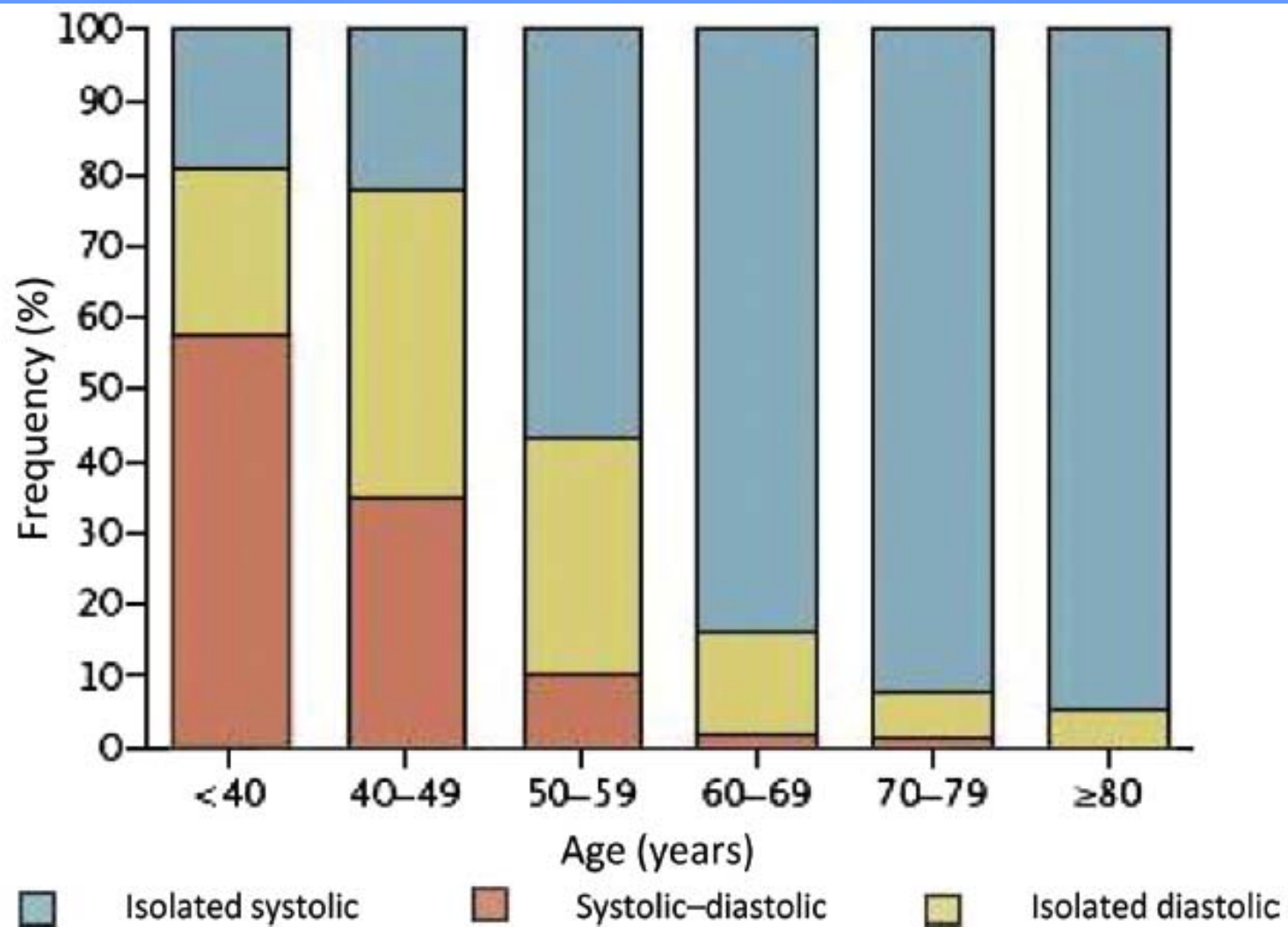
**Figure 5.** Joint influences of systolic blood pressure and pulse pressure on coronary heart disease. Joint influences of SBP and pulse pressure on CHD risk, from the Framingham Heart Study.

# Hypertension Classification

## JNC-7

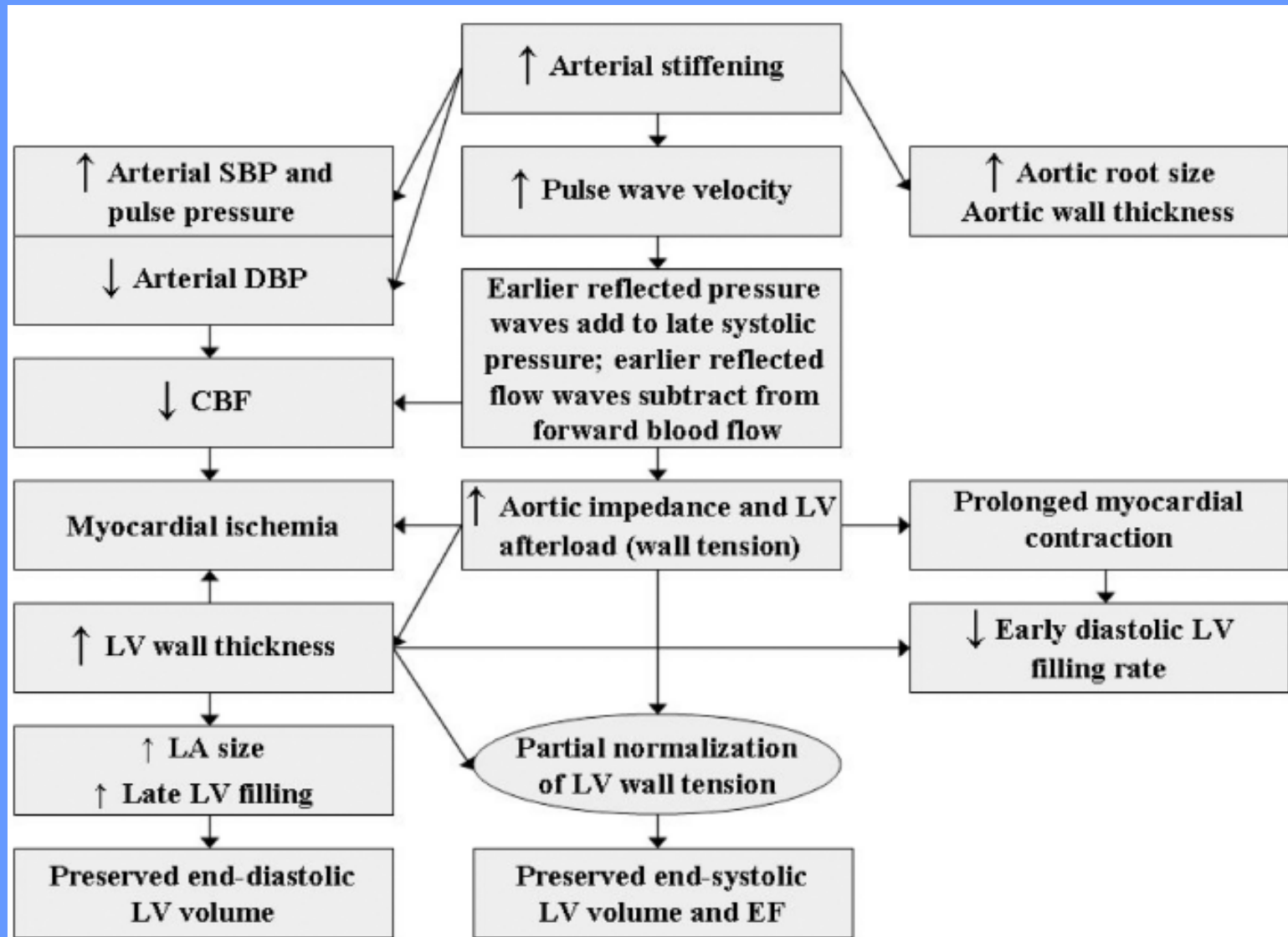
<b>BP Classification</b>	<b>SBP mmHg</b>		<b>DBP mmHg</b>
Normal	<120	and	<80
Prehypertension	120–139	or	80–89
Stage 1 Hypertension	140–159	or	90–99
Stage 2 Hypertension	≥160	or	≥100

## Type of Hypertension by Age



**Figure 4.** Frequency of untreated hypertension according to subtype and age. Reprinted from Chobanian et al.<sup>44</sup>

# Pathophysiology



# Pathophysiology

- It is becoming clear that many of these “normative” age-related changes can be diminished with improvements in lifestyle, such as lower salt intake, increased physical activity, and less weight gain.
- TOB, ETOH, Caffeine, and NSAID use can lead to an increase in BP in the elderly through increased vascular resistance.
- Renal Artery Stenosis is another potential cause of elevated BP.

# Benefit of Blood Pressure Control

	<u>Average Reduction</u>
Stroke*	35-40%
Heart Attack	20-25%

\*SHEP, PROGRESS, Syst-Eur,  
HYVET

# Benefit of Blood Pressure Control

- HYVET NEJM 2008
- randomized 3845 pts 80 y/o or older, SBP 160mmHg to Indapamide + Perindopril if necessary (75% given both).
- 2 years: Lower CVA 30%, CHF 64%, CV events 23%, and all-cause death 21%.
- Concerns: Recruitment outside US accounted for 98% of patients. Stage 1 HTN not included.

# BP Treatment Goals

**Table 2. American Heart Association Recommendations for Prevention and Management of Ischemic Heart Disease: Blood Pressure Targets**

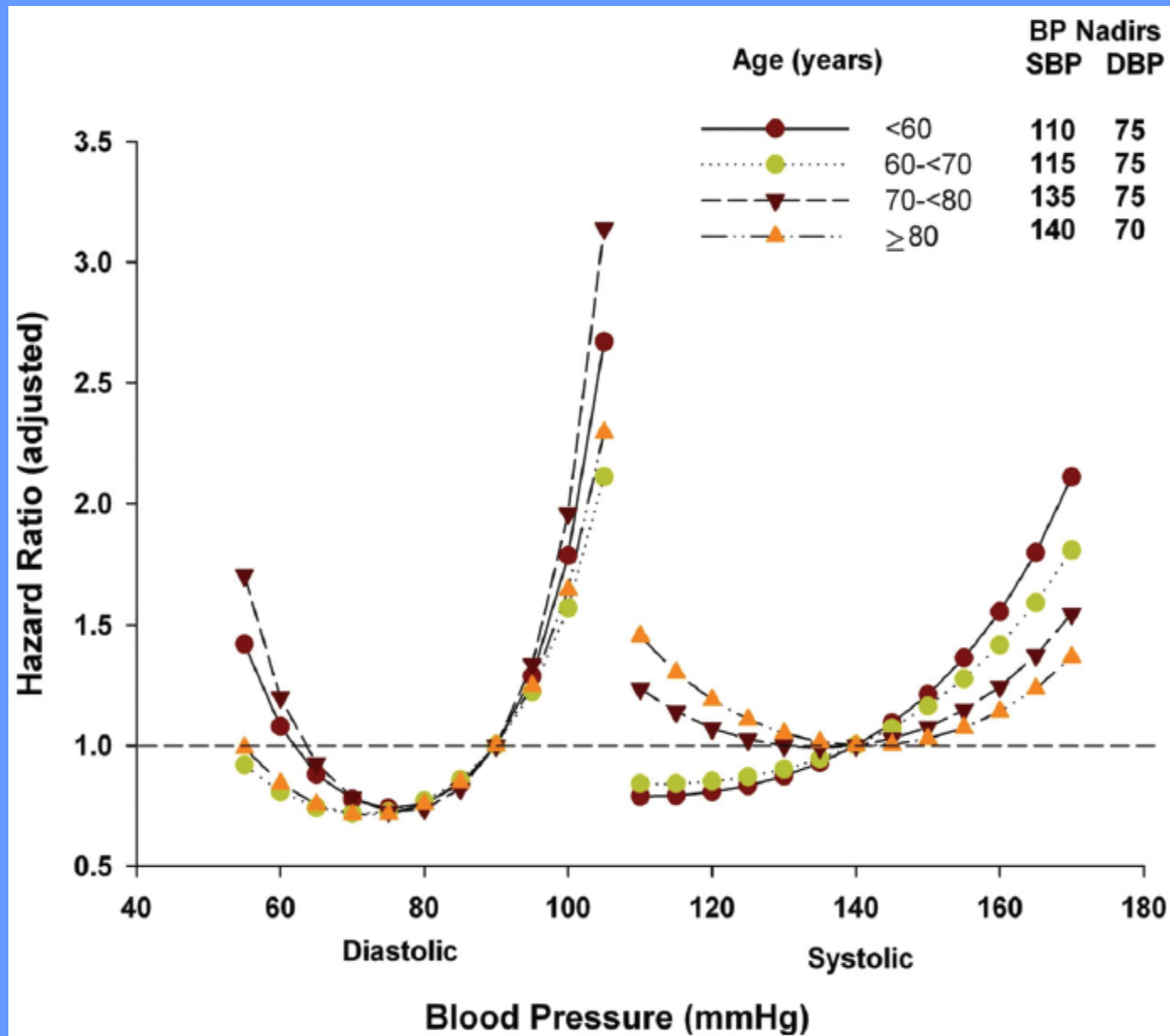
Patient Type	Goal BP (mm Hg)
Left ventricular dysfunction	<120/80
Diabetes mellitus	<130/80
Chronic renal disease	<130/80
CAD or CAD risk equivalents*	<130/80
Carotid artery disease	<130/80
Peripheral arterial disease	<130/80
Abdominal aortic aneurysm	<130/80
High-risk (10-y FRS $\geq$ 10%)	<130/80
Uncomplicated hypertension (none of above)	<140/90

BP indicates blood pressure; CAD, coronary artery disease; and FRS, Framingham Risk Score.

Modified from Rosendorff et al.<sup>26</sup>

\*CAD risk equivalents include diabetes mellitus, peripheral arterial disease, carotid arterial disease, and abdominal aortic aneurysm.

# BP Treatment Goals



# Clinical Evaluation of HTN

- History and Exam
- Urinalysis, especially for albuminuria
- Blood Chemistry for Na, K, renal function
- Fasting Cholesterol Profile and Glucose or HgbA1c (other CV risk factors)
- ECG
- Often a Transthoracic Echocardiogram for LVH and LV EF.
  
- Consider home BP monitoring

# Blood Pressure Treatment Lifestyle Modification

<b>Modification</b>	<b>Approximate SBP reduction (range)</b>
Weight reduction	5–20 mmHg/10 kg weight loss
Adopt DASH eating plan	8–14 mmHg
Dietary sodium reduction	2–8 mmHg
Physical activity	4–9 mmHg
Moderation of alcohol consumption	2–4 mmHg

# Blood Pressure Treatment

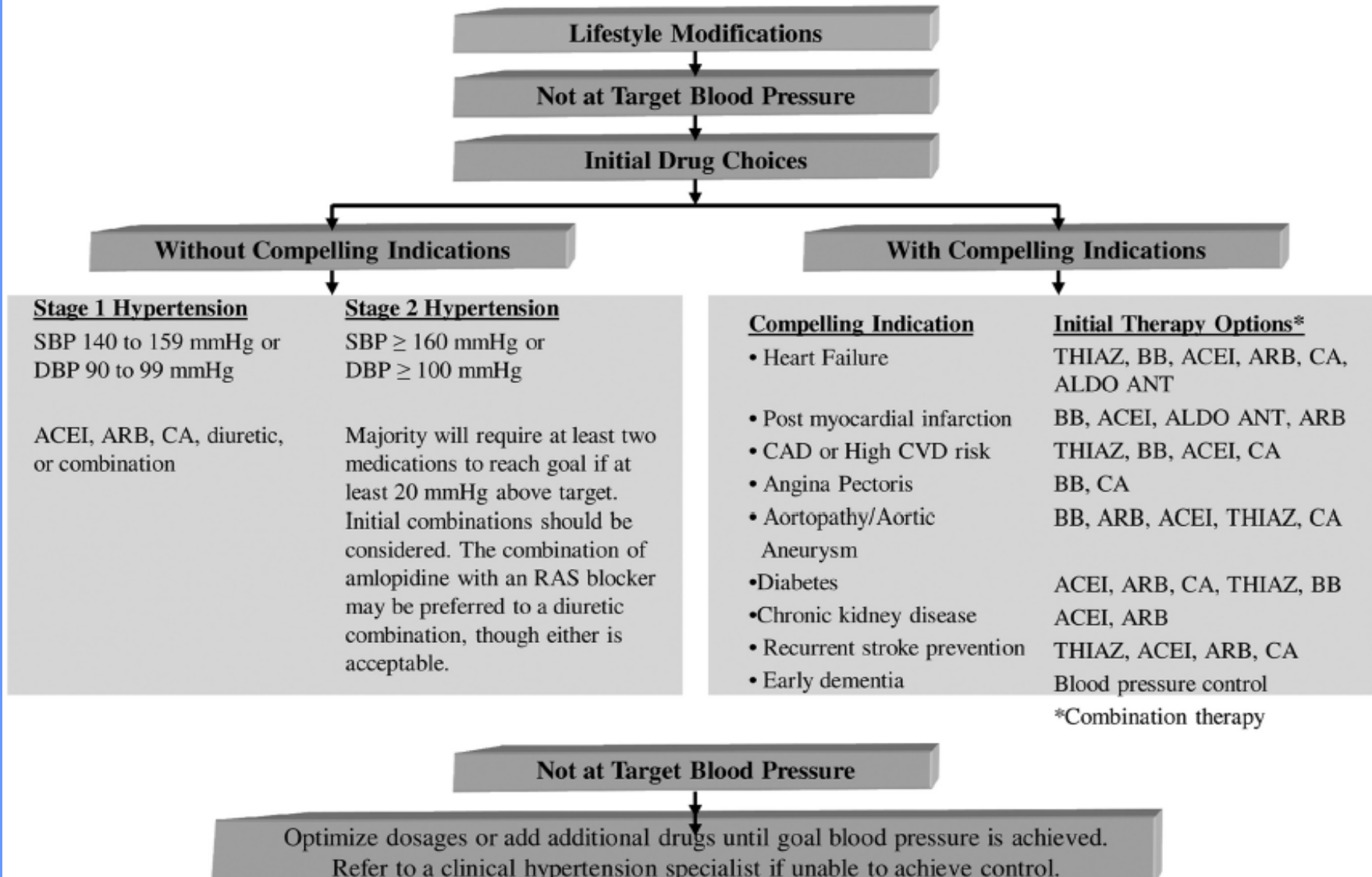
## Dietary Factors

The DASH diet:

- Low in Saturated Fat and Total Fat
- Low in added sugar and sweets
- Increase in Fruits, Vegetables, Whole Grains and Beans.
- Fat-free or Low-Fat Milk and Dairy Products
- Less Red-Meat, More Fish and Poultry (no skin)

# Blood Pressure Treatment: Drug Therapy

Target systolic blood pressure is  $\leq 140$  mmHg in patients aged 55 to 79  
 Target systolic blood pressure is  $\leq 140$  mmHg in patients  $\geq$  aged 80+  
 Achieved values  $< 140$  mmHg for those aged  $\leq 79$  are appropriate;  
 but for those aged  $\geq 80$ , 140 to 145 mmHg, if tolerated, can be acceptable.

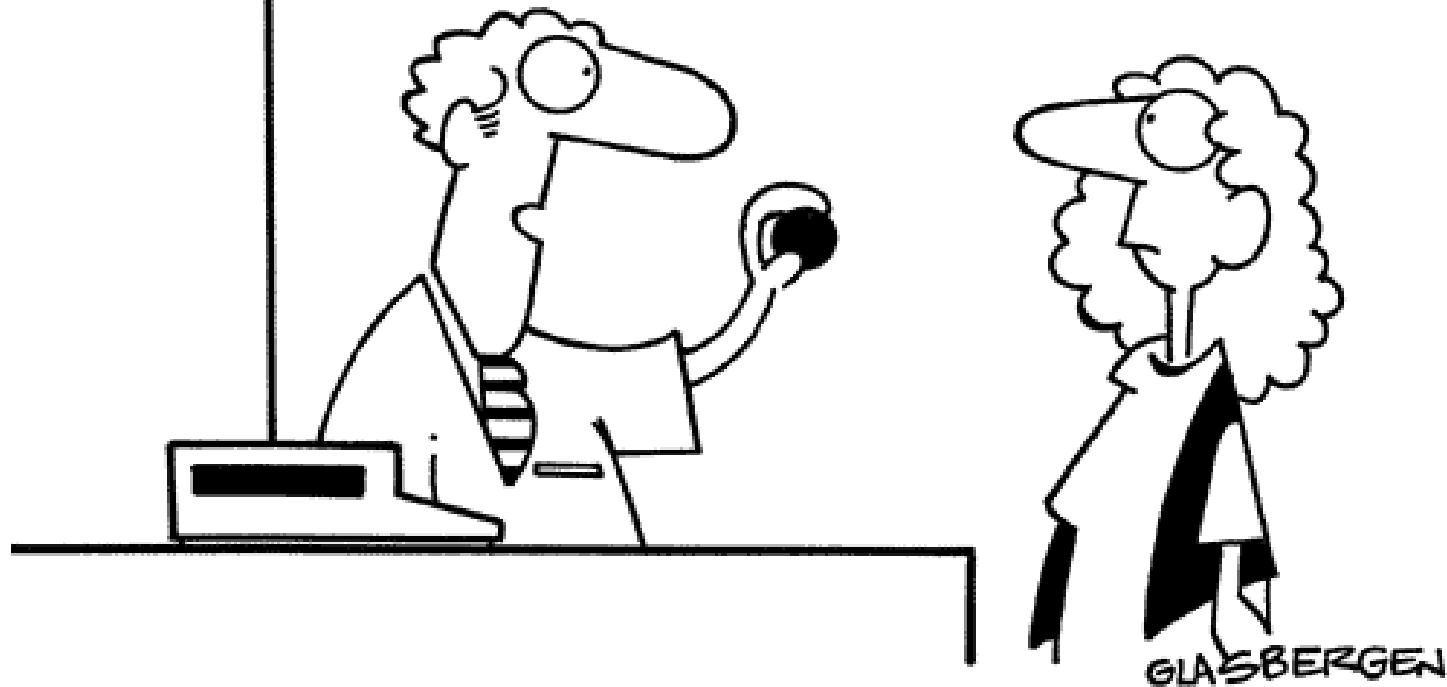


## Some Drug Therapy Issues

- Chlorthalidone has a longer duration of action and more potent than HCTZ. Diuretics can worsen orthostatic hypotension or cause hypokalemia. Consider Dyazide or Spironolactone.
- Alpha-blockers not first line (worse outcomes in ALLHAT).
- Good data with Ca Ch blockers, ACE inh, ARB.
- Verapamil and Diltiazem should not be used when LV EF is decreased.
- Beta-blockers are less effective, reserved for specific indications or second-line therapy.
- Aliskiren is effective but no outcomes data yet.
- No definitive role for renal artery stenting in RAS.
- Most pts with decreased renal function need a loop diuretic.
- Most patients need 2-4 medications, but compliance decreases as number of medications increases.

# PREVENTION of HTN

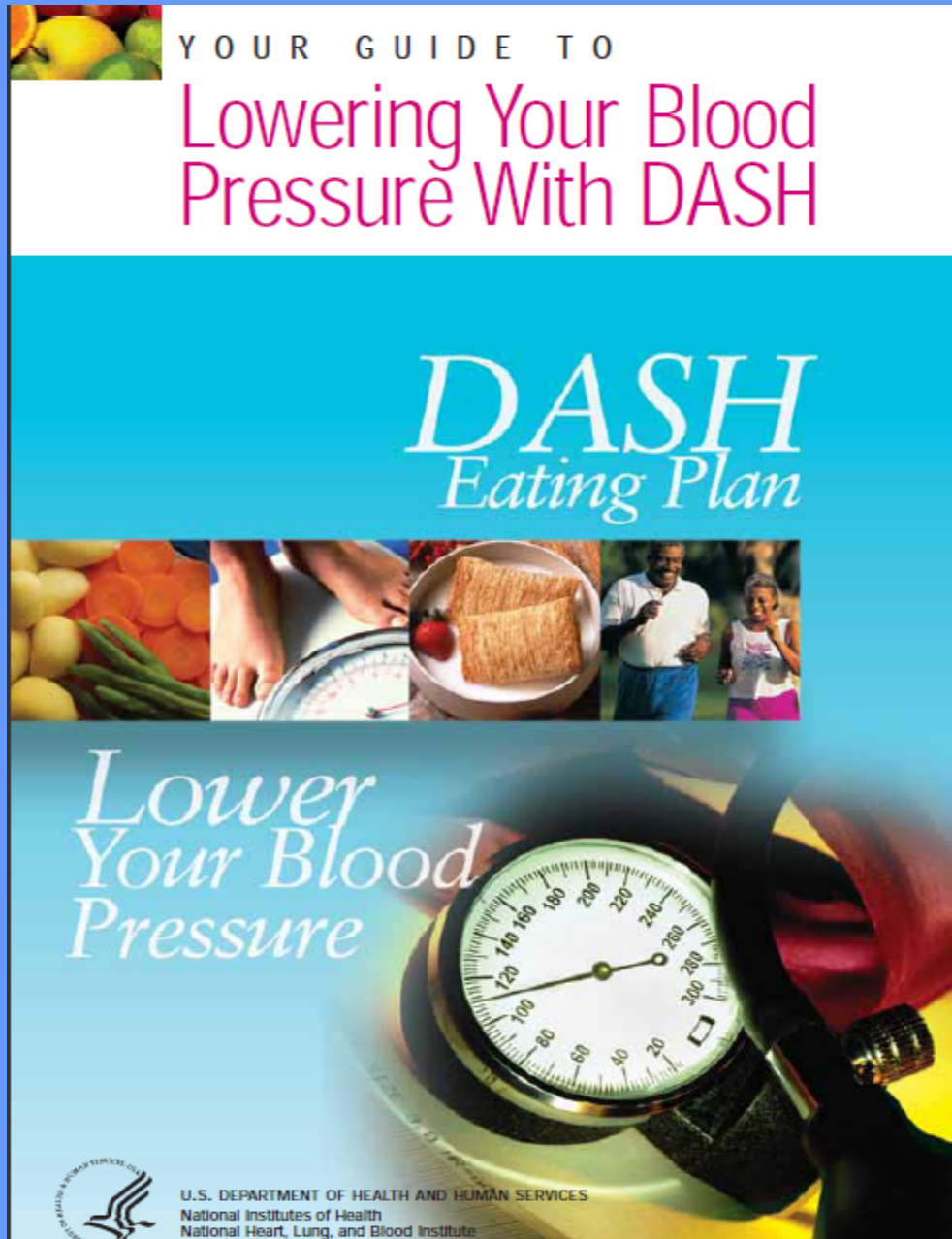
## Pharmacy



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**“It’s the most effective diet pill we sell.  
Chase it around a handball court for an hour a day.”**


# PREVENTION of HTN




YOUR GUIDE TO  
Lowering Your Blood Pressure With DASH

*DASH*  
*Eating Plan*

*Lower Your Blood Pressure*





U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES  
National Institutes of Health  
National Heart, Lung, and Blood Institute

# PREVENTION: REDUCE SALT

Food Groups	Sodium (mg)
<b>Whole and other grains and grain products*</b>	
Cooked cereal, rice, pasta, unsalted, 1/2 cup	0-5
Ready-to-eat cereal, 1 cup	0-360
Bread, 1 slice	110-175
<b>Vegetables</b>	
Fresh or frozen, cooked without salt, 1/2 cup	1-70
Canned or frozen with sauce, 1/2 cup	140-460
Tomato juice, canned, 1/2 cup	330
<b>Fruit</b>	
Fresh, frozen, canned, 1/2 cup	0-5
<b>Low-fat or fat-free milk and milk products</b>	
Milk, 1 cup	107
Yogurt, 1 cup	175
Natural cheeses, 1 1/2 oz	110-450
Process cheeses, 2 oz	600
<b>Nuts, seeds, and legumes</b>	
Peanuts, salted, 1/3 cup	120
Peanuts, unsalted, 1/3 cup	0-5
Beans, cooked from dried or frozen, without salt, 1/2 cup	0-5
Beans, canned, 1/2 cup	400
<b>Lean meats, fish, and poultry</b>	
Fresh meat, fish, poultry, 3 oz	30-90
Tuna canned, water pack, no salt added, 3 oz	35-45
Tuna canned, water pack, 3 oz	230-350
Ham, lean, roasted, 3 oz	1,020
* Whole grains are recommended for most grain servings.	