

Lab 4 Heart Rate & Blood Pressure

I. Attendance – Cards

II. Heart Rate?

What? # beats per min

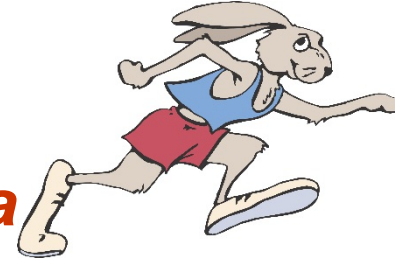


< 60 (slow)
bradycardia

Wide range!

60-100
normal

> 100 (fast)
tachycardia



Where? heart or peripheral arteries

How? palpation *to feel* vs. auscultation *to hear* vs. EKG...

Why? vital sign "Vital signs are vital!" Pilar Bradshaw, MD

III. Blood Pressure?

What? force exerted by blood on large systemic arteries

Where? peripheral/systemic, large arteries

How? direct (cannula) vs. indirect (external cuff, P meter = sphygmomanometer + stethoscope/sensor)

Why? vital sign + CVD risk indicator low < 120/<80 mm Hg
Hypertension $\geq 140/90$ mm Hg. See LLM pp 4-5, 4-6

IV. Practice Tests

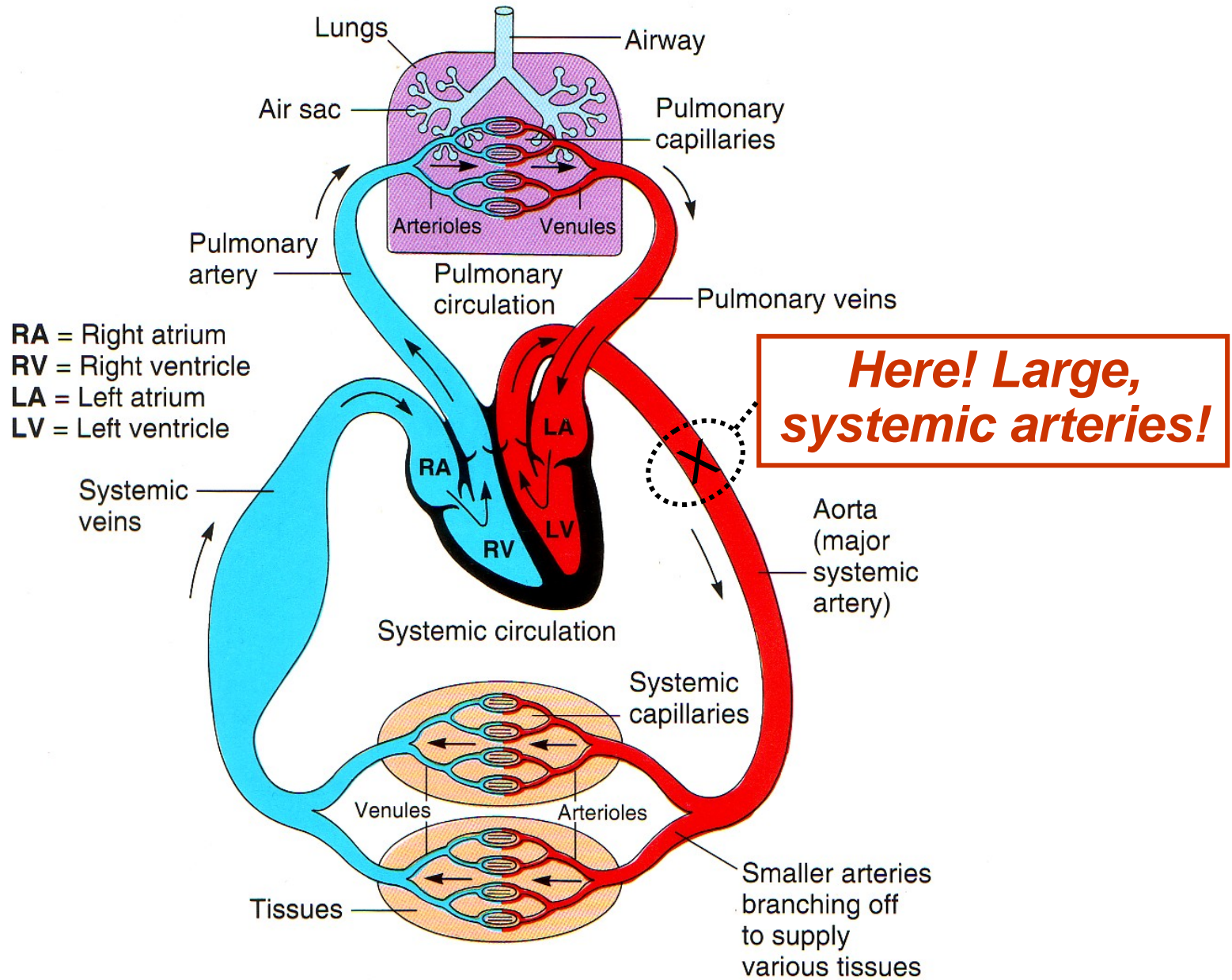
V. High Blood Pressure at Time of Diagnosis Time-Life

Factors that Influence Heart Rate (HR, b/min) & Blood Pressure (BP, mm Hg)

Short list of individual, exercise & environmental variables (superimposed upon genetics) that alter HR & BP:

1. **arousal state** (asleep, awake, drowsy, unconscious...BI 121 lecture!)
2. **bladder and/or bowel distention** (if > semi-filled, higher BP!)
3. **exercise** (mode, frequency, intensity, duration, distribution)
4. **illness** (type, current, past...)
5. **menstrual phase** (follicular, ovulatory, luteal)
6. **nutritional status** (alcohol, caffeine, H₂O, meal composition & time)
7. **pets** (on lap? may lower BP!)
8. **posture** (supine, seated, standing)
9. **sleep** (less elevates!)
10. **smoking status** (# & time)
11. **temperature** (ambient & body)
12. **white-coat effect or white-coat syndrome,...**

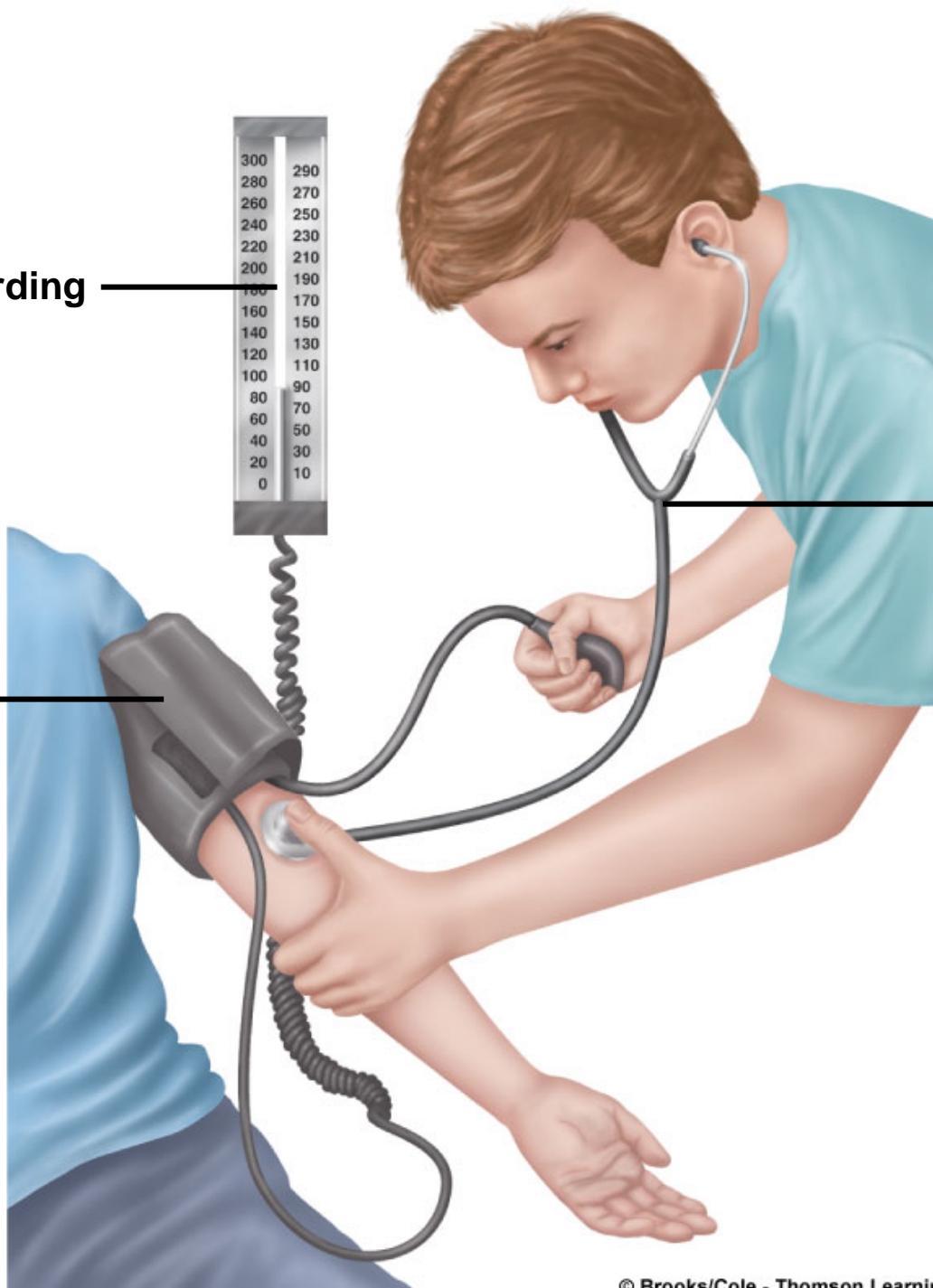
Where is BP measured?



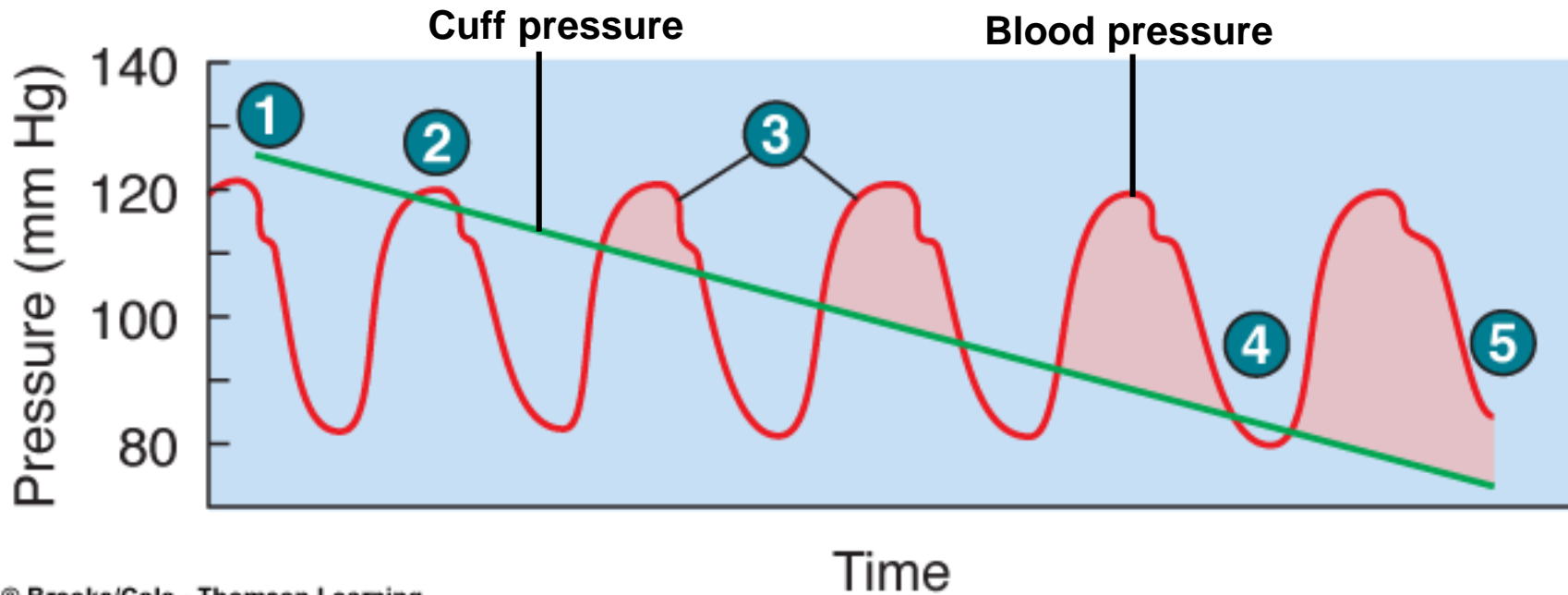
Pressure-recording device

Inflatable cuff

Stethoscope

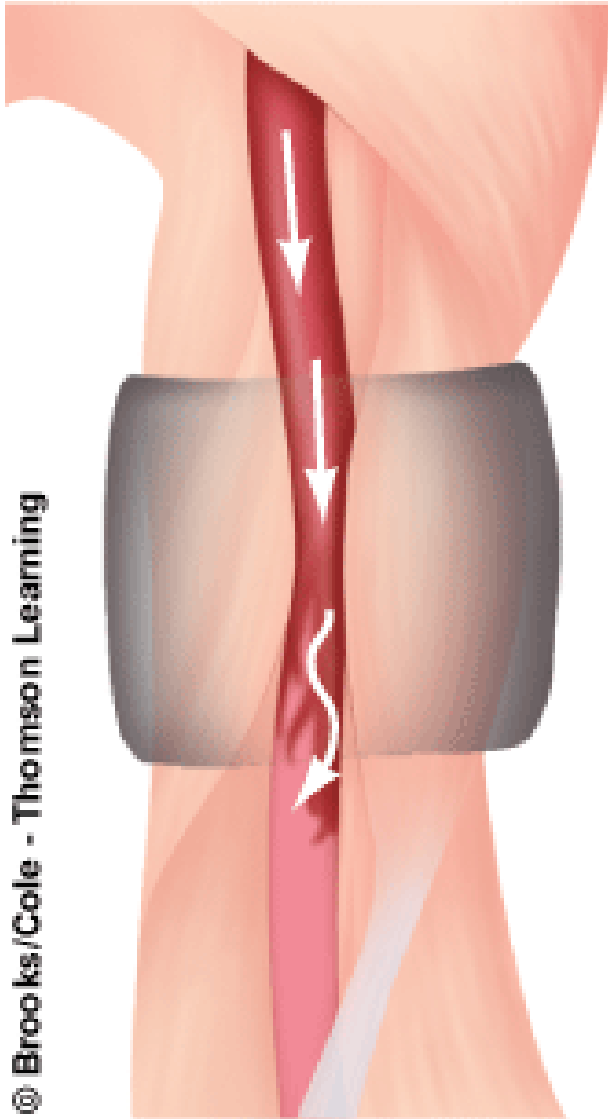


LS 2006 fig 10-7a p 282.



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Sounds are heard only when blood jets through a partially occluded artery.



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When cuff pressure is between 120 and 80 mm Hg:

Blood flow through the vessel is turbulent whenever blood pressure exceeds cuff pressure.

Intermittent sounds are heard as blood pressure fluctuates throughout the cardiac cycle.

Personal Measurements

Heart Rate (HR): Record on p 4-3, Q 1.

6-sec → add 0 to end or multiply by 10

15-sec → multiply by 4

60-sec → record as is; seated resting HR

Each of you place stethoscope over your heart to detect *lub-dup, lub-dup...*

Blood Pressure (BP): Record on p 4-3, Q 2.

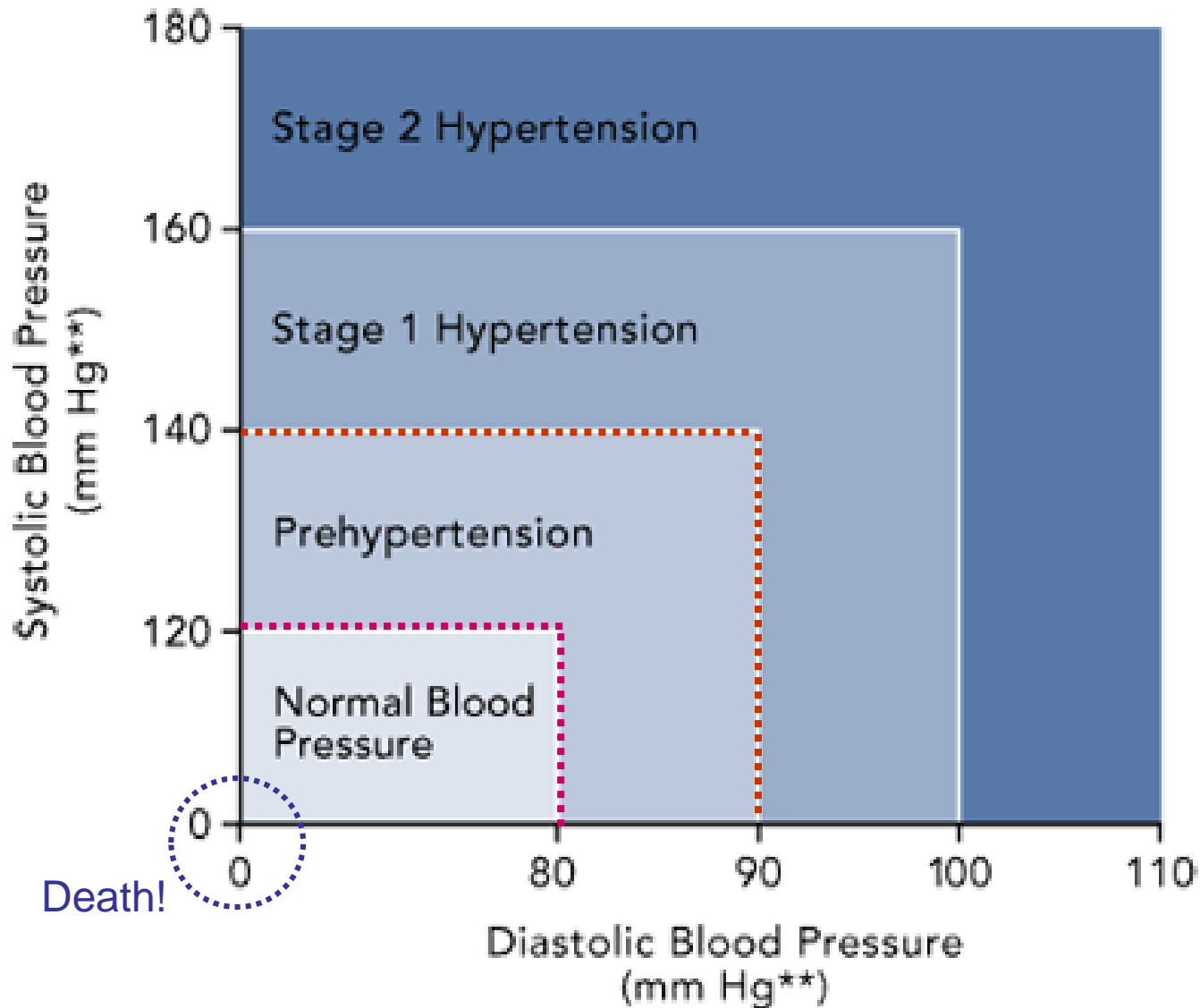
R arm x 2 → SBP/DBP & HR

L arm x 2 → SBP/DBP & HR

Try to detect Korotkoff sounds w/stethoscope during a few automated BP measurements.

Evaluate values & answer Q 3, p 4-3 @ later time.

Where does your pressure fall?



What can I do if I have prehypertension or hypertension?

1. See your doctor & have your BP checked regularly.
Also, see if it's safe to start an exercise program.
2. Exercise, exercise, exercise!
20-60 min of aerobic exercise on most days.
3. Lose weight, if overweight.
Exercise, exercise, exercise!
4. Add spice to your life, not salt.
Garlic, cilantro, oregano, pepper & onion instead of salt!
5. Do the *DASH*, don't overdo it!
[*Dietary Approaches to Stop Hypertension*](#), plant-based Mediterranean diet w/plenty of vegetables, fruits, whole grains & non-/low-fat dairy to ensure much Ca^{2+} , K^{+} & Mg^{2+} intake.
6. Limit alcohol intake.
No more than 1-2 drinks/d for ♀, 2-3 drinks/day for ♂.

*High Blood Pressure at the
Time of Diagnosis*

Time-Life Educational Videos