

**A 35 year old man reporting high blood pressure readings outside of the office: Does this patient have hypertension?**

## Introduction

A 35-year-old male has come for a routine exam.. First, you see that your nurse has recorded his height at 172cm, and his weight at 82 kg giving a Body Mass Index of 30. He is stocky but not obese, rather muscular.

His blood pressure is recorded as 135/85 mmHg.

As the history unfolds, the patient recounts that he is concerned about his blood pressure because his father died of a stroke at age 72 and had high blood pressure.

He works as an Emergency Medical Technician (EMT) and has had blood pressure checks by his colleagues with readings in the 130-160/80-100 mmHg range.

He exercises at home twice a week. He smokes one pack of cigarettes a day and has been unable to stop.

He is otherwise healthy as far as you can determine from your history, is married and has a stable and satisfactory job and living situation.

# What would you like to say to your patient to obtain additional information?

20%

1. "When did you last smoke a cigarette?"

20%

2. "Describe your exercise routine."

20%

3. "Are you taking any over the counter medication or using any nutritional supplements or recreational drugs?"

20%

4. "Did you have coffee, tea or caffeinated soda before your visit today?"

20%

5. All of the above.

## **Correct Choice:**

**E. All of the above.**

## **Incorrect choices:**

**A. "When did you last smoke a cigarette?"**

**Partially correct,**

**Smoking can acutely raise the blood pressure  
and the effect can last for 20-30 minutes.**

b

.

c

.

**B. “ Describe your exercise routine.”**

**Partially correct,**

**Exercise itself has differential effects on the blood pressure.**

**Anaerobic or isometric exercise such as weight lifting or the use of resistance weight training machinery has no beneficial effect on the blood pressure. (Some of the highest recorded blood pressures have been found in weight lifters).**

**Aerobic exercise such as power walking, jogging, biking, and swimming lowers the blood pressure.**

**C. Are you taking any over the counter medications or using any nutritional supplements or recreational drugs?"**

Partially correct,

A variety of over the counter medications can cause blood pressure elevations

The over the counter cold, flu and coryza medications are common possible causes.

In addition, a variety of "recreational" drugs including stimulants such as dextroamphetamine (Dexedrine), methylphenidate (Ritalin), and cocaine can elevate blood pressures

**Table 02: Over the counter products which can elevate blood pressure readings**

- Non steroidal anti inflammatory (NSAID) medications, Cox 1
- Sympathomimetics, over the counter decongestants (Sudafed, Claritin D, etc.)
- Natural licorice, chewing tobacco

**Table 03: Nutritional products and recreational drugs that can elevate blood pressure readings**

- Cocaine and cocaine withdrawal
- Ma huang, "herbal ecstasy," and other phenylpropanolamine analogs
- Ephedra
- Nicotine and withdrawal
- Anabolic steroids, androgens
- Narcotic withdrawal
- Methylphenidate
- Phencyclidine
- Ketamine
- Ergotamine and other ergot-containing herbal preparations
- St. John's wort

**Chobanian AV, Bakris GL, Black HR, et al. Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure. Hypertension December 2003;1206-1252.**

**TABLE 24. Common Substances Associated With Hypertension in Humans**

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**Prescription Drugs**

**Cortisone and other steroids** (both cortico- and mineralo-), ACTH

**Estrogens** (usually just oral contraceptive agents with high estrogenic activity)

**Nonsteroidal anti-inflammatory drugs**

**Phenylpropanolamines and analogues**

**Cyclosporine and tacrolimus**

**Erythropoietin**

**Sibutramine**

Ketamine

Desflurane

Carbamazepine

Bromocryptine

Metoclopramide

Antidepressants (especially venlafaxine)

Buspirone

Clonidine, BB combination

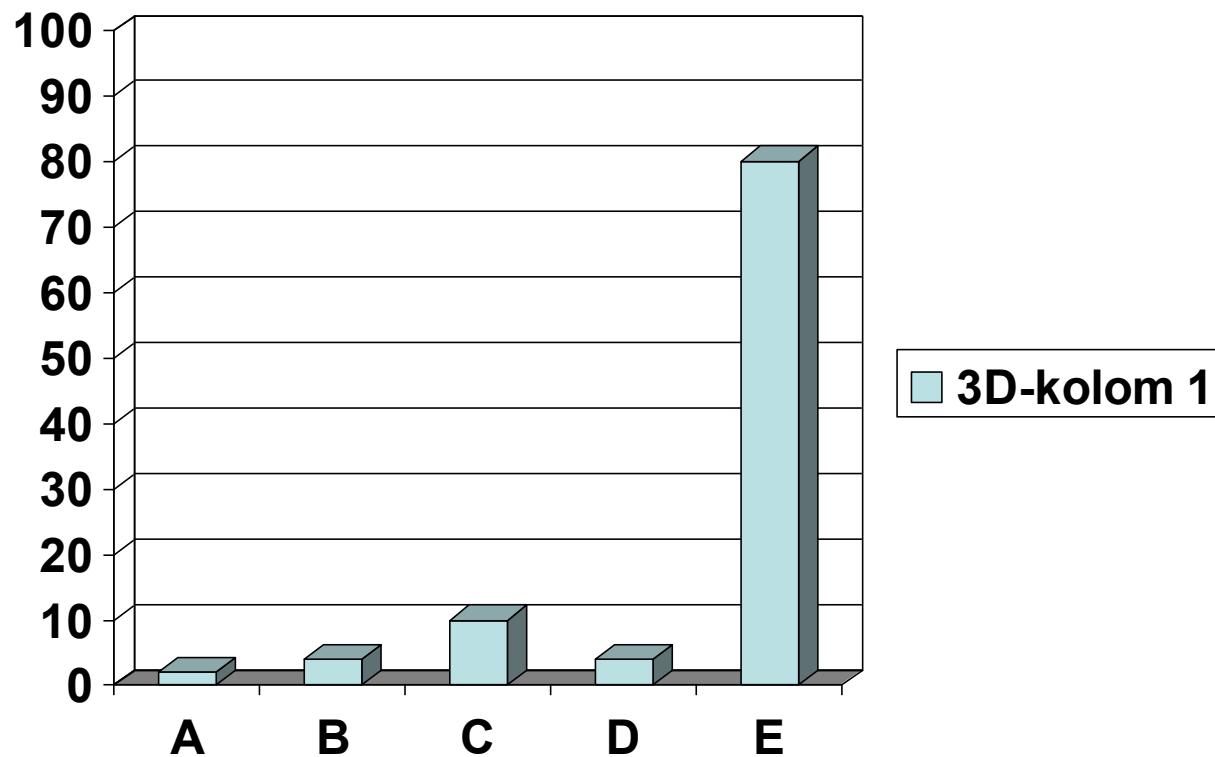
Pheochromocytoma: BB without  $\alpha$ -blocker first; glucagon

Clozapine

**D. "Did you have coffee, tea or caffeinated soda before your visit today?"**

**Partially correct,**

**Caffeinated coffee and other beverages, such as caffeinated soda or tea, can elevate blood pressure for 20-30 minutes.**



## **Further Information**

**He last smoked about two hours ago, is not taking any over the counter or recreational drugs and exercises using light weights and an exercise machine at home. His pattern of workouts is irregular, once or twice a week.**

**He follows a mixed dietary pattern meaning that he has an evening meal at home on most nights.**

**He frequently depends on a variety of local "take out" restaurants in the neighborhood for evening meals, gets a sandwich for lunch at a local delicatessen, and rarely eats breakfast.**

**He usually drinks two cups of coffee a day and has wine with some evening meals, usually sharing a bottle with his wife once or twice a week.**

# As you begin your assessment of this patient, which of these statements would apply?

25%

1. He is unlikely at this point to have hypertension because his smoking has elevated his blood pressure. The principal focus should be smoking cessation.

25%

2. His alcohol intake is likely helping to lower his blood pressure.

25%

3. He may have hypertension.

25%

4. This patient has hypertension. He will need medication to lower his blood pressure when he leaves the office today.

## **Correct Choice:**

**cC. He may have hypertension.**

.

**This patient may have hypertension.**

**The accurate and reliable diagnosis of hypertension depends of the correct and reproducible measurement of the blood pressure itself.**

**The blood pressure determination upon which a treating physician or non-physician provider makes clinical decisions should be made by the provider him or herself.**

## **Incorrect Choices:**

**A. He is unlikely at this point to have hypertension because his smoking has elevated his blood pressure. The principal focus should be smoking cessation.**

**Smoking raises the blood pressure acutely and the effect is over within 20-30 minutes.**

**In fact, if anything, chronic cigarette smoking may lower blood pressure.**

**B. His alcohol intake is likely helping to lower his blood pressure.**

**There is no benefit to sporadic low-level alcohol intake.**

**Regular, daily low levels of alcohol intake are associated with lower blood pressure readings and may be beneficial.**

**The alcohol level associated with this benefit is two beers/day for men, one beer/day for women,  
2 glasses of wine/day for men, 1 glass of wine/day for women,  
3 oz. 80 % liquor/day for men, 1.5 oz. 80% liquor/day for women.**

Incorrect Choice :

**D. This patient has hypertension. He will need medication to lower his blood pressure when he leaves the office today.**

At worst, this patient has "pre-hypertension" as defined by the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC 7).

He may need blood pressure medication in the future but the initial treatment should be non-pharmacologic.

The successful management of his blood pressure will require combined non-pharmacologic and possibly pharmacologic intervention.

Virtually all medications used in the treatment of hypertension are more effective in the context of non-pharmacologic therapy.

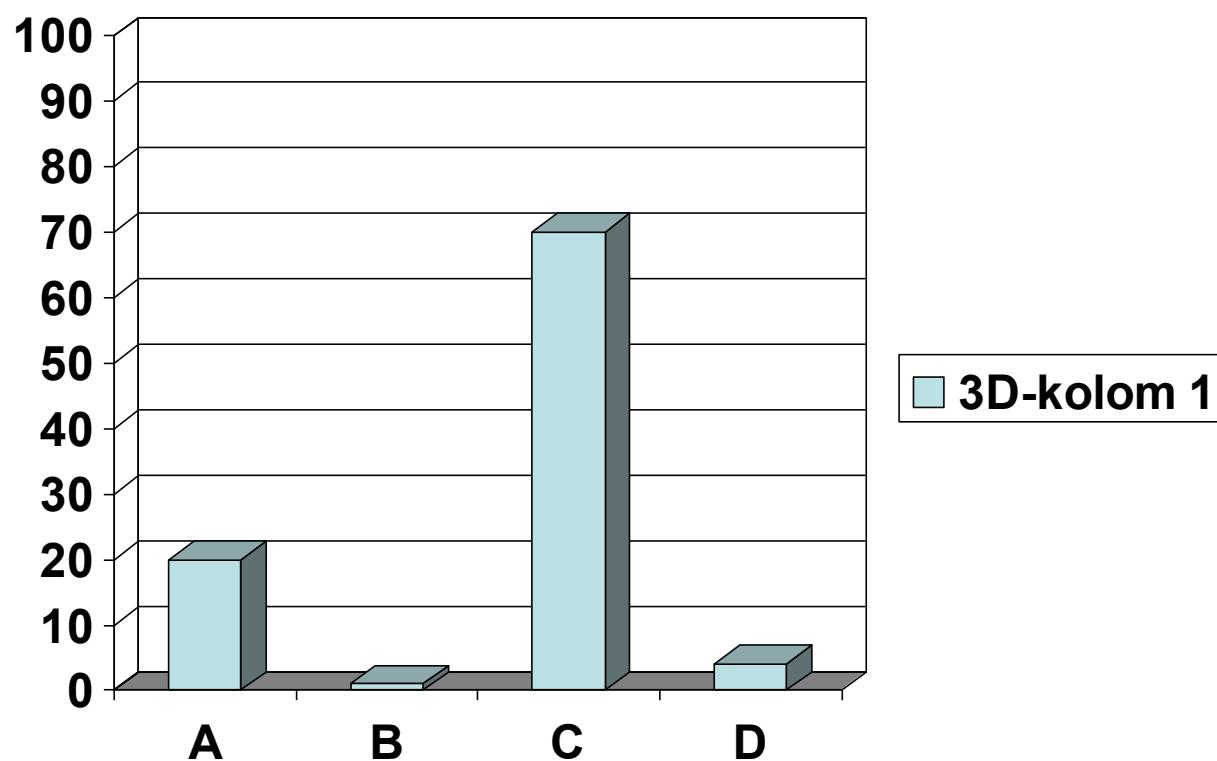
Furthermore, you should not imply early in this patient's care that a pill will "fix" his problem.

**TABLE 2. Changes in Blood Pressure Classification**

| JNC 6 Category      | SBP/DBP         | JNC 7 Category    |
|---------------------|-----------------|-------------------|
| <b>Optimal</b>      | < 120/80        | → Normal          |
| <b>Normal</b>       | 120–129/80–84   | → Prehypertension |
| <b>Borderline</b>   | 130–139/85–89   |                   |
| <b>Hypertension</b> | ≥ 140/90        | → Hypertension    |
| Stage 1             | 140–159/90–99   | → Stage 1         |
| Stage 2             | 160–179/100–109 | → Stage 2         |
| Stage 3             | ≥ 180/110       |                   |

Sources: The sixth report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure. *Arch Intern Med* 1997;157:2413–46.

The seventh report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure. *JAMA* 2003;289:2560–2571.



## **Physical Examination**

**You ask the patient to assume a comfortable seated position on the exam table with his feet resting on a small stool.**

# Your planning for the rest of the physical examination for this patient should include the following:

**25%**

1. All the components of a usual examination. This patient does not have hypertension because his blood pressures outside of the office are normal.

**25%**

2. A determination of the blood pressure with a cuff covering 80% of the right arm, the arm relaxed and with his feet on a small stool and an assessment of the vascular system including evidence for hypertensive retinopathy and atherosclerosis, palpation of the neck and abdomen

**25%**

3. A brief exam so that there will be ample time to discuss lifestyle changes, such as smoking cessation and exercise.

**25%**

4. The focused exam, option (B) and the collection of laboratory data related to heart (EKG), lung (chest radiograph) and kidney function (BUN and creatinine) before making any further determination of blood pressure severity.

## **Correct Choice:**

- b** **B. A determination of the blood pressure with a cuff covering 80% of the right arm, the arm relaxed and with his feet on a small stool and an assessment of the vascular system including evidence for hypertensive retinopathy and atherosclerosis, palpation of the neck and abdomen.**

**The proper technique for blood pressure determination must be consistent for all patient encounters so that your clinical decisions are consistent.**

**The key components for accurate blood pressure determination are presented in the next table:**

**Table 05: Proper components of accurate office blood pressure determination**

- Patient seated quietly for 5 minutes or more
- Patient seated with the feet resting on the floor or a stool
- Arm supported at heart level
- The blood pressure cuff should encircle 80% of the arm
- Two readings should be made. If they differ by more than 3-5 mm Hg, then the process should be repeated
- Both arms should be checked at least once and the arm with the higher reading should be noted and followed for subsequent readings
- A mercury column should be used. Alternative measurement devices should be calibrated frequently and compared to a reliable standard.
- The cuff should be inflated 20-30 mm Hg above the highest auscultated reading
- The cuff should be deflated slowly, 2 mm Hg per second
- Systolic blood pressure is where the first Korotkoff sound is heard
- Diastolic blood pressure is where the last Korotkoff sound (the fifth) is last heard.
- If there is no loss of auscultated sound, then the pitch change, the fourth Korotkoff sound, is used for the diastolic level.

The blood pressure should be taken in both arms and the higher arm should be used for subsequent follow up and clinical decision-making. In most patients, the arms will be nearly equal but in an occasional patient there will be a 5-10 mmHg difference.

The arm must be relaxed so that you are aware of the full weight of the extremity. (When the patient holds the arm for the blood pressure exam, the reading can be elevated by 5-10 mmHg).

The vascular system should be assessed both for the effects of hypertension, best appraised by fundoscopic examination and concurrent vascular disease. The vascular exam should include auscultation for bruits at the neck, in the abdomen, at the groin and a palpation of distal pulses in the feet. As noted, both arms should be checked and if there is more than a 10 mmHg difference, subclavian stenosis should be considered.

The neck should be palpated for evidence of thyroid enlargement and the abdomen palpated for masses.

## **Incorrect Choices:**

- A. All the components of a usual examination. This patient does not have hypertension because his blood pressures outside of the office are normal.**

**You have neither excluded nor established that this patient has hypertension.**

**There are elements of his history such as his blood pressure readings and the family history that are worrisome.**

**Furthermore, you need to determine this patient's blood pressure yourself.**

**Incorrect Choice:**

- C. **A brief exam so that there will be ample time to discuss lifestyle changes, such as smoking cessation and exercise.**

**There is enough information to have a high suspicion that this patient either has hypertension or is at risk for the development of hypertension.**

**90% of adults are at lifetime risk for developing high blood pressure.**

**The family history as well as the possibly high readings by the technician are of concern.**

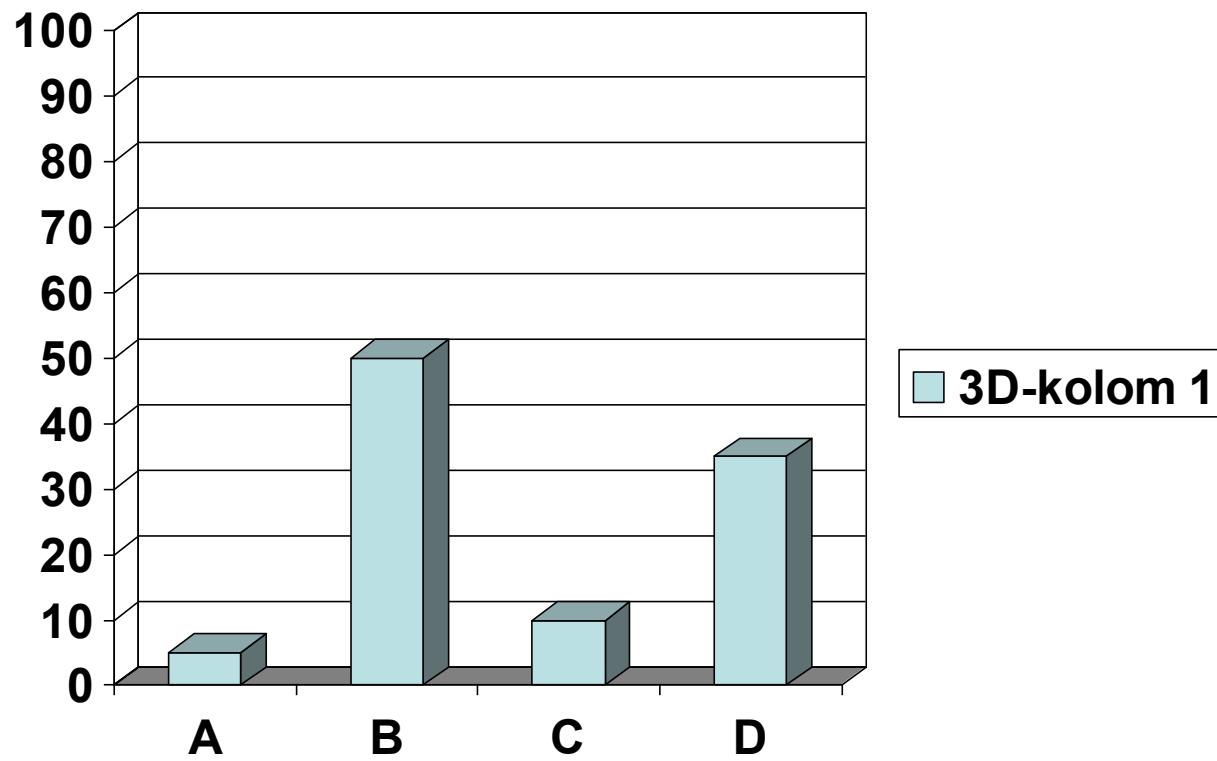
**Incorrect Choice:**

- D. **The focused exam, option (b) and the collection of laboratory data related to heart (EKG), lung (chest radiograph) and kidney function (BUN and creatinine) before making any further determination of blood pressure severity.**

**Blood pressure severity is determined by the clinical context.**

**Your decision to intervene is based on the level of the blood pressure, the concurrent risk factors and evidence of end organ damage.**

**Determining the level of the office blood pressure is the first step in the process of assessment and the only information needed to make the diagnosis.**



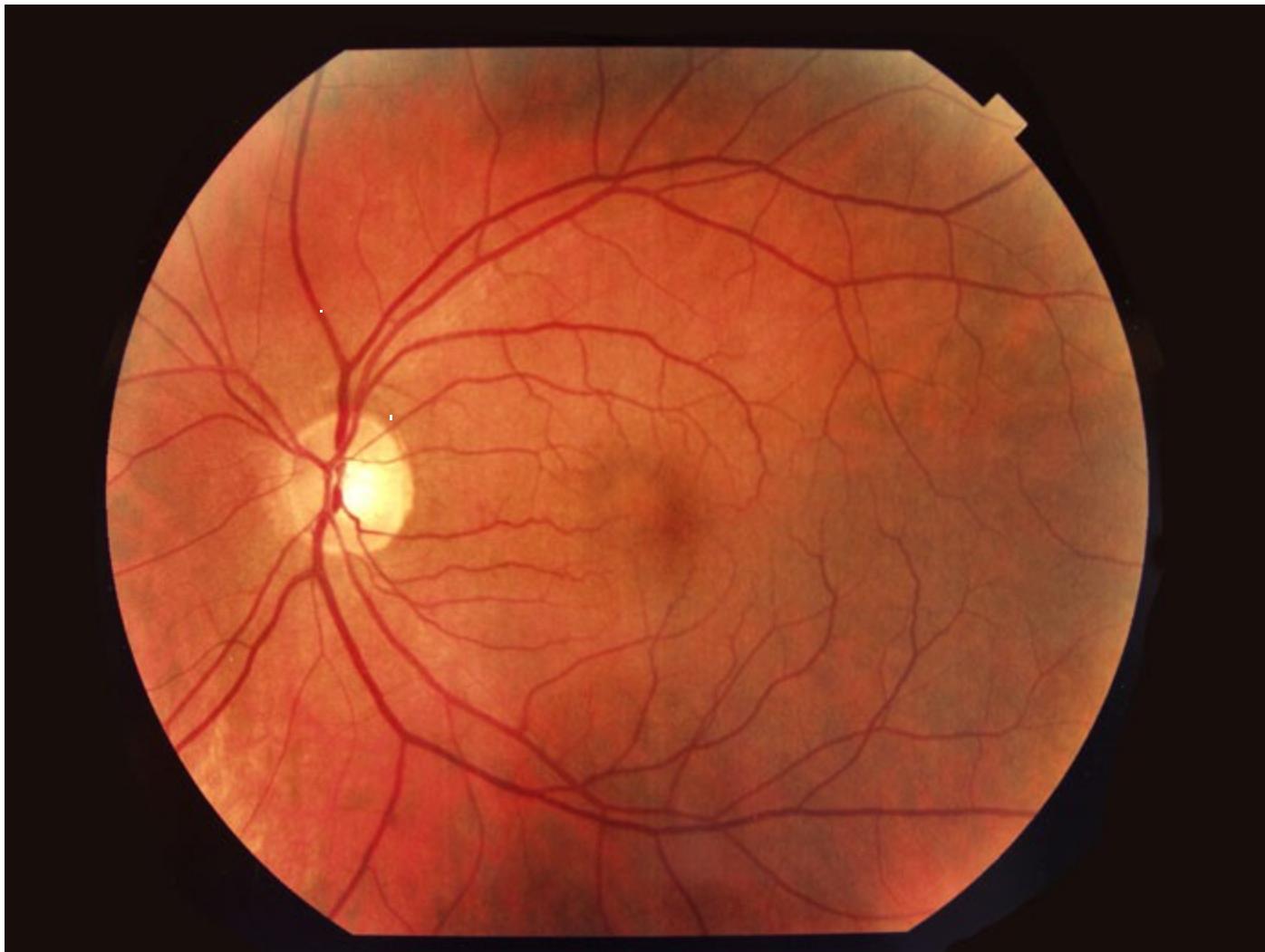
# Which of the following is the most likely fundoscopic exam for this patient?

25% 1. Normal

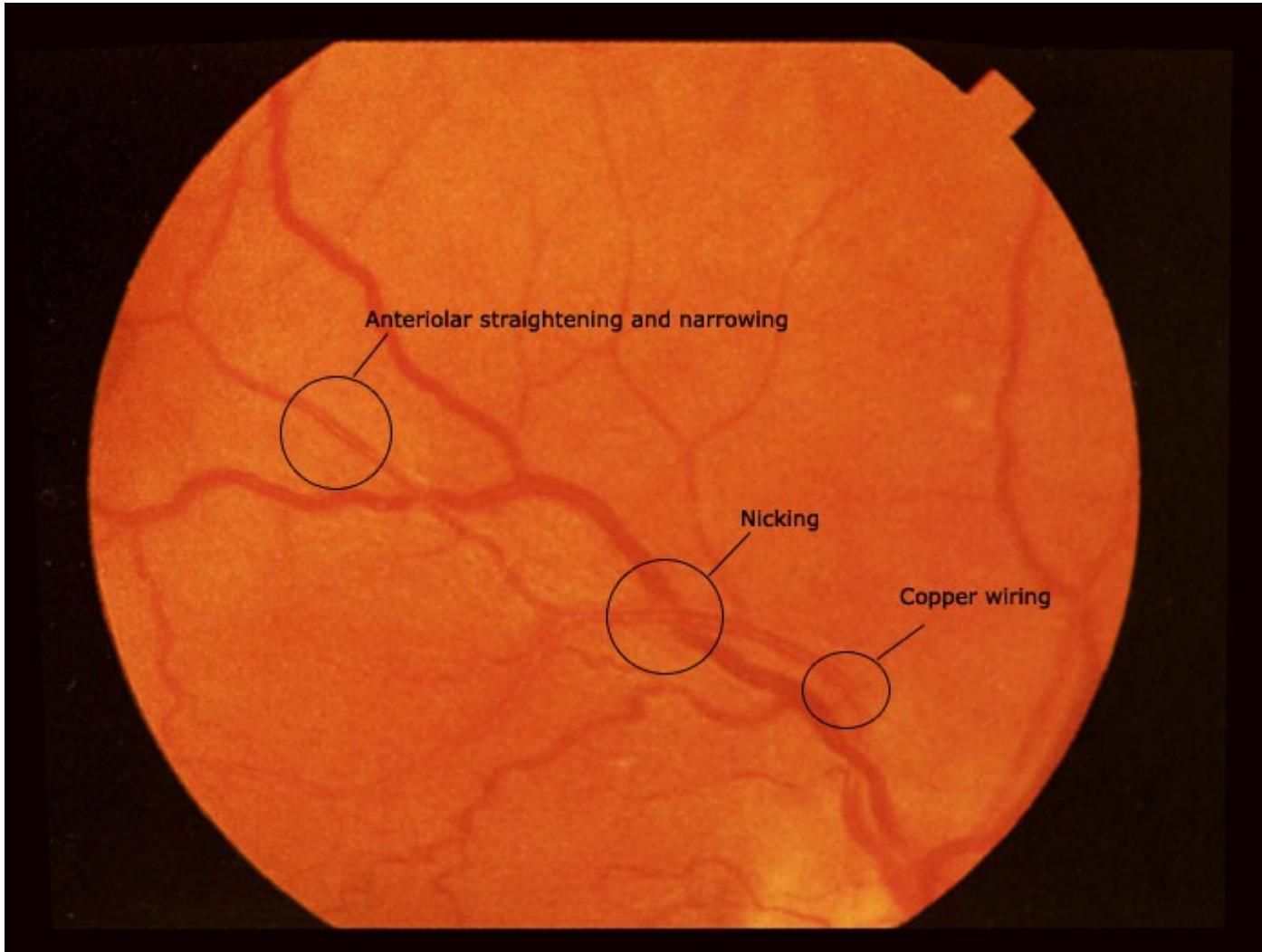
25% 2. Mild retinopathy

25% 3. Moderate retinopathy

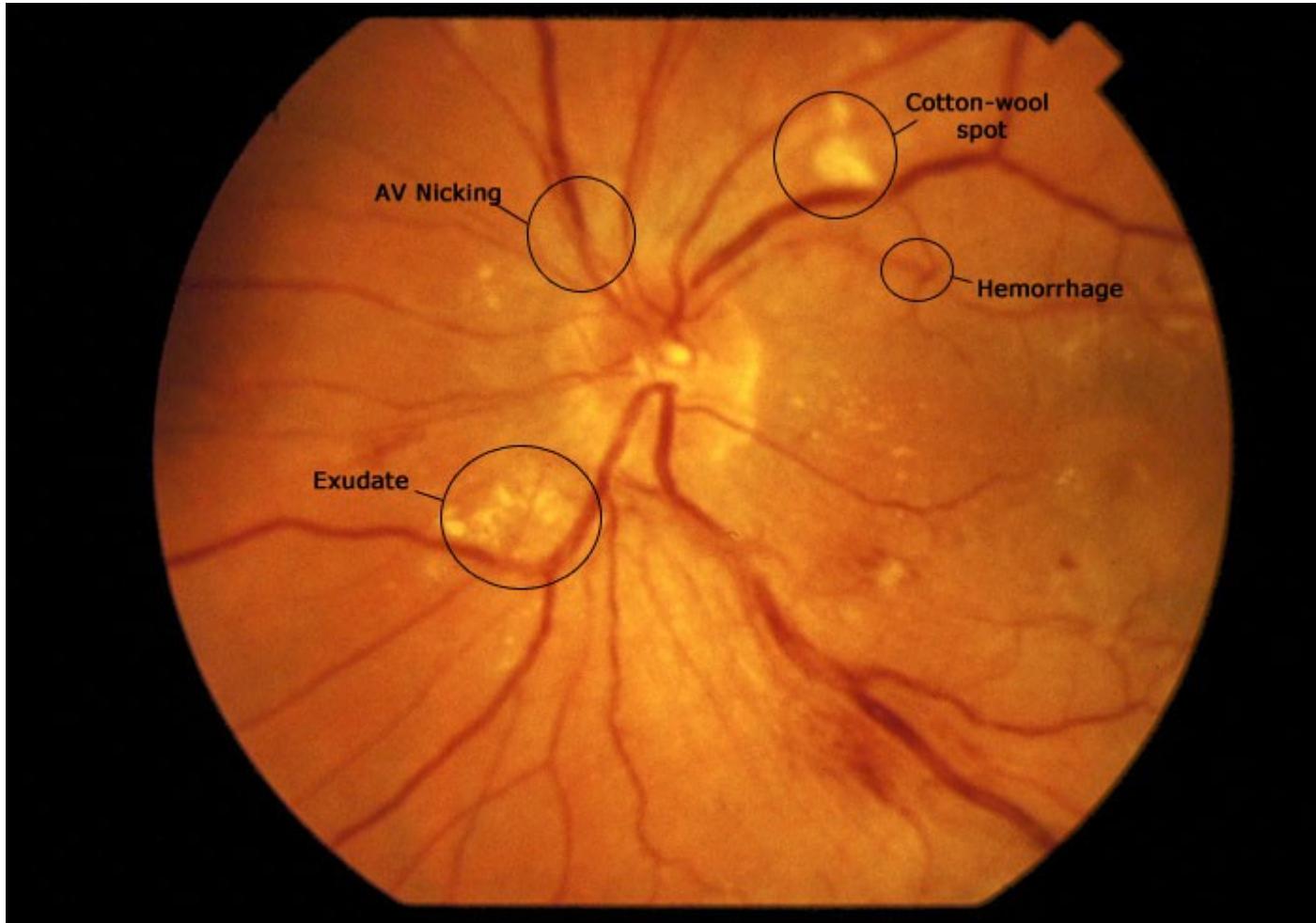
25% 4. Severe retinopathy



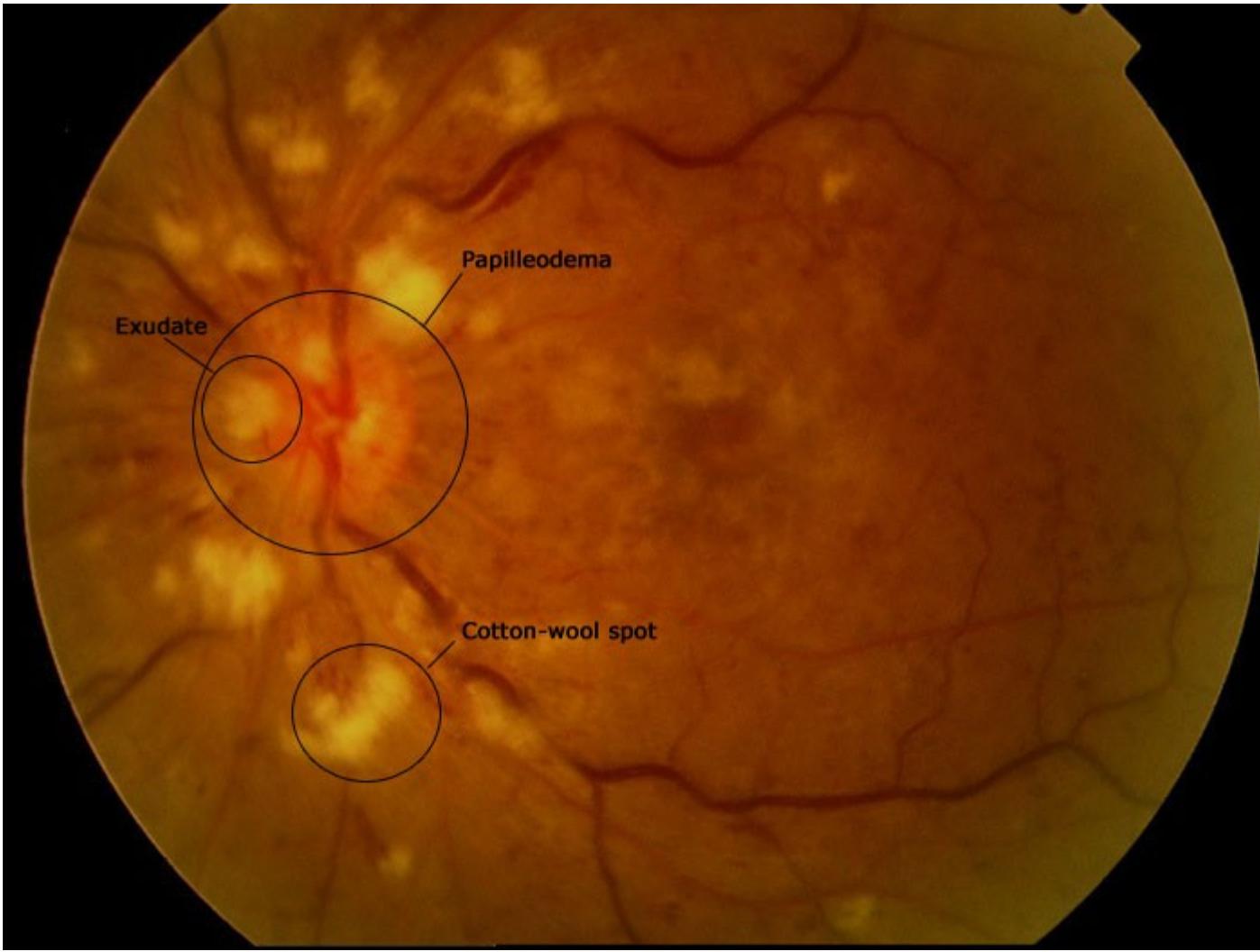
**Normal fundus**



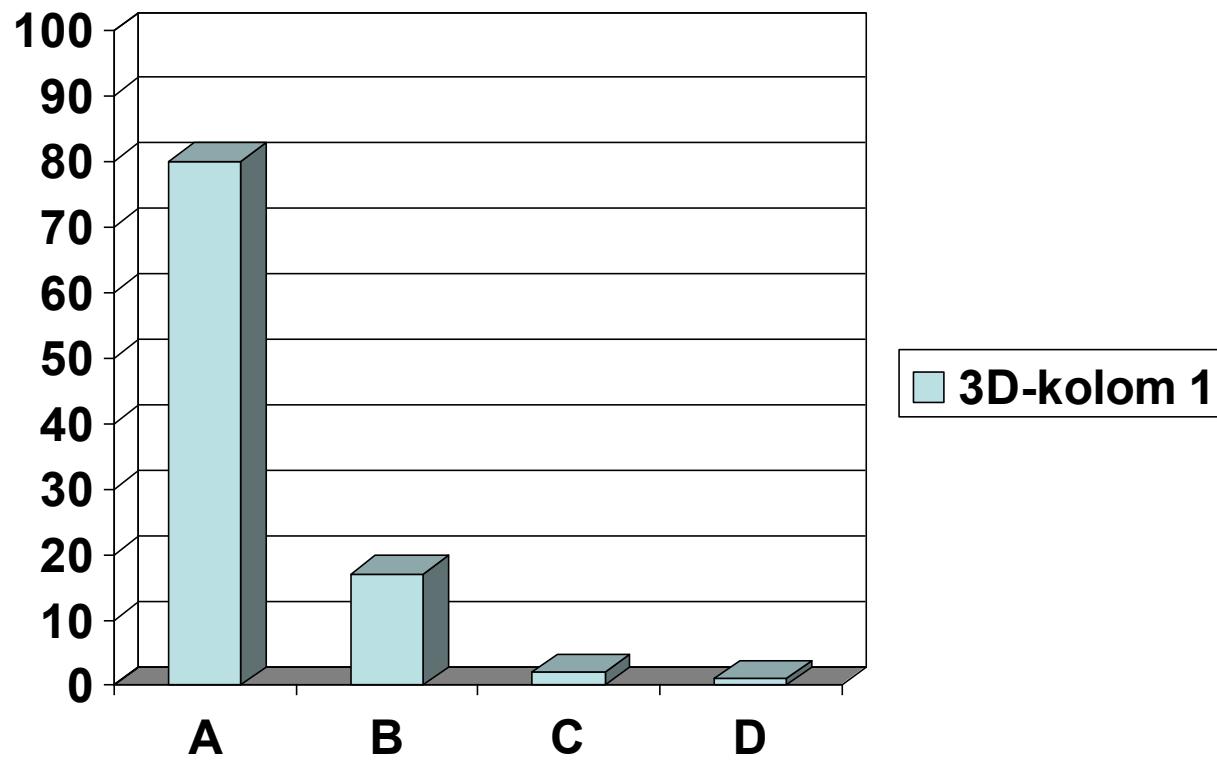
**Mild retinopathy consists of generalized arteriolar narrowing, vascular narrowing and straightening, "copper wiring" and "nicking" or "nipping" of the veins where arterioles cross.**



**Moderate retinopathy includes the changes of mild retinopathy and hemorrhages, micro aneurisms, cotton-wool spots, and/or hard exudates.**



**Severe retinopathy consists of the changes of moderate retinopathy and papille edema.**



## **Final clinical findings**

**At the conclusion of the exam, you have found a blood pressure of 140/90 in the right arm in a sitting position. The left arm is within 2-3 mmHg of this reading.**

**There is no abnormality on fundoscopic exam and the remainder of the physical is normal.**

**At this point, you tell the patient that you want to obtain further tests.**

# What would you include in your testing for this patient?

- 20%** 1. A determination of kidney function (BUN and creatinine), serum electrolytes, an EKG, urine analysis, HDL and LDL cholesterol, triglyceride and glucose levels
- 20%** 2. A chest x-ray
- 20%** 3. An echocardiogram to assess for left ventricular function and hypertrophy
- 20%** 4. A 24-hour urine for creatinine and protein to assess for proteinuria
- 20%** 5. None of the above

**Correct Choice:**

- A. **A determination of kidney function (BUN and creatinine), serum electrolytes, an EKG, a urine analysis, total, HDL and LDL cholesterols, and triglyceride and glucose levels**

**The staging of the newly diagnosed hypertensive patient should include tests to exclude**

- **underlying renal disease**
- **unprovoked hypokalemia (an indicator of aldosterone excess),**
- **left ventricular hypertrophy,**

**and baseline values of potassium, sodium and renal function.**

**Lipid profiling is done to assess for concurrent cardiovascular risk factors.**

Incorrect choices:

- B. **A chest x-ray**  
is not needed for the initial evaluation and management  
of the hypertensive patient.
- C. **An echocardiogram to assess for left ventricular function  
and hypertrophy**
- The EKG is a highly specific indicator for LVH.  
The absence of LVH on EKG makes LVH on echocardiogram  
unlikely.
- Though the presence of left ventricular hypertrophy (LVH) on  
echocardiogram indicates over 50% higher risk for  
cardiovascular death in hypertensive patients, there is no  
initial treatment decision based on this information.

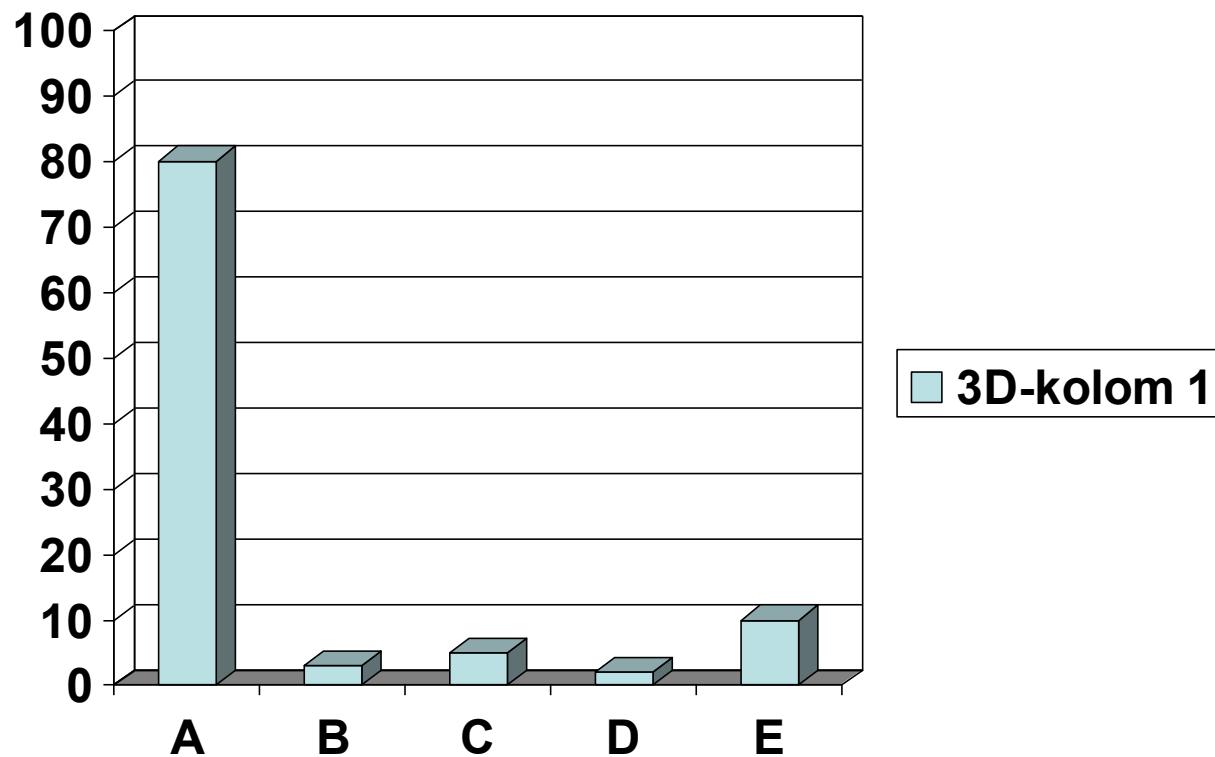
Incorrect choices:

**D. A 24-hour urine for creatinine and protein to assess for proteinuria**

**There is no need to establish the baseline glomerular filtration rate. The routine urine analysis for albumin is a sufficient screen for proteinuria.**

**E. None of the above**

**The results of laboratory testing are useful for staging hypertension and guide treatment decisions.**



# You prepare your thoughts to have the closing discussion with the patient.

## What are you going to say to this patient?

- 20%**    1. You have hypertension, and I feel that you should begin medication therapy.
- 20%**    2. You have hypertension, and you should learn meditation and biofeedback.
- 20%**    3. You have hypertension, and there is nothing more you can do with your exercise routine.
- 20%**    4. Your BMI is high, but you are very muscular so further weight reduction will have little impact on your blood pressure.
- 20%**    5. You have hypertension, but you may be able to control this by reducing the salt and fat content and increasing the fruit and vegetable content of your diet without changing your calorie intake.

**Correct Choice:**

**E. You have hypertension, but you may be able to control this by reducing the salt and fat content and increasing the fruit and vegetable content of your diet without changing your calorie intake.**

**The DASH diet (Dietary Approaches To Stop Hypertension) is a calorie neutral diet that has been shown to be effective in the treatment of hypertension.**

**The diet itself reduces dietary fats, especially snacks, dressings, condiments, and increases fruits and vegetables.**

## **Incorrect Choices:**

- A. **You have hypertension, and I feel that you should begin medication therapy.**

**This patient has hypertension, but you should employ non-pharmacologic interventions before initiating medication therapy.**

**The use of non-pharmacologic interventions focuses the patient on the central importance of life style decisions in the development of hypertension.**

**Furthermore, this is most importantly because virtually all pharmacologic interventions will be more effective if there are employed in conjunction with non-pharmacologic therapies.**

**Lower doses of medications will likely be more effective if the patient has a commitment to and understanding of non-pharmacologic therapy.**

## **Incorrect Choices:**

**B. You have hypertension, and you should learn meditation and biofeedback.**

Though there may be some short-term benefit, there are no studies that show consistent long-term benefit.

If the patient strongly desires to attempt blood pressure control through biofeedback and meditation, then it is appropriate to be supportive with close follow-up for response.

Other life style interventions should be also prescribed if you choose to support biofeedback and meditation.

## **Incorrect Choices:**

- C. You have hypertension, and there is nothing more you can do with your exercise routine.**

c  
:

**Shifting to a program of aerobic exercise, 30-40 minutes 3-4 times per week could reduce his systolic blood pressure by 4-9 mmHg.**

## **Incorrect Choices:**

- D. Your BMI is high, but you are muscular so further weight reduction will have little impact on your blood pressure.**

**Even in individuals who are not strikingly overweight, a 10-20 pound weight reduction can lower systolic blood pressure by 5-20 mmHg.**

**Likewise, in the very obese, even relatively modest weight reduction can have a similar beneficial effect.**

## The DASH Diet

### Dietary Approaches To Stop Hypertension

The DASH diet emphasizes a shift to a low fat, high fruit and vegetable diet  
Detailed patient education material is available on the National Heart, Lung  
and Blood Institute (NHLBI) web site

[www.nhlbi.nih.gov/health/public/heart/hbp/dash/](http://www.nhlbi.nih.gov/health/public/heart/hbp/dash/)

**Free access to salt is a major contributor to the evolution of hypertension.**

**This patient's diet has many salt sources, especially take-out "fast food" items. The best strategy is to look for high salt dietary items such as soy sauce, ketchup, prepared meats such as salami and ham, prepared sauces, canned soups and to restrict or ban them.**

## The DASH diet composition, average servings per day of different food groups

| DASH: Dietary content, servings per day |              |                      |                         |
|---|--------------|----------------------|-------------------------|
|   | Control diet | Fruit/vegetable diet | Combination diet (DASH) |
| <b>Fruits/juices</b>                    | <b>1.6</b>   | <b>5.2</b>           | <b>5.2</b>              |
| <b>Vegetables</b>                       | <b>2</b>     | <b>3.3</b>           | <b>4.4</b>              |
| <b>Grains</b>                           | <b>8.2</b>   | <b>6.9</b>           | <b>7.5</b>              |
| <b>Low-fat dairy</b>                    | <b>0.1</b>   | <b>0</b>             | <b>2</b>                |
| <b>Reg-fat dairy</b>                    | <b>0.4</b>   | <b>0.3</b>           | <b>0.7</b>              |
| <b>Nuts/seeds/legumes</b>               | <b>0</b>     | <b>0.6</b>           | <b>0.7</b>              |
| <b>Beef/pork/ham</b>                    | <b>1.5</b>   | <b>1.8</b>           | <b>0.5</b>              |
| <b>Poultry</b>                          | <b>0.8</b>   | <b>0.4</b>           | <b>0.6</b>              |
| <b>Fish</b>                             | <b>0.2</b>   | <b>0.3</b>           | <b>0.5</b>              |
| <b>Fats/oils/salad dressing</b>         | <b>5.8</b>   | <b>5.3</b>           | <b>2.5</b>              |
| <b>Snacks/sweets</b>                    | <b>4.1</b>   | <b>1.4</b>           | <b>0.7</b>              |

**The DASH diets emphasized more vegetables, fruits, low fat dairy and a near elimination of condiments, dressings, butter, snacks and sweets.**

**The average fall in systolic blood pressure can be as high as 11 mmHg (5.5mm Hg in average diastolic fall)**

**Some patients will not experience these results, while others will have an even better response. Unfortunately, there is no data that shows the long term benefit of this diet.**

**Appel LJ et al. A clinical trial of the effects of dietary patterns on blood pressure. NEJM 1997; 336:1117-1124.**

**TABLE 9. Lifestyle Modifications To Prevent and Manage Hypertension\***

| Modification                      | Recommendation   | Approximate SBP Reduction<br>(Range)† |
|-----------------------------------|--|---------------------------------------|
| Weight reduction                  | Maintain normal body weight (body mass index 18.5–24.9 kg/m <sup>2</sup> ).  | 5–20 mm Hg/10 kg <sup>92,93</sup>     |
| Adopt DASH eating plan            | Consume a diet rich in fruits, vegetables, and low-fat dairy products with a reduced content of saturated and total fat.   | 8–14 mm Hg <sup>94,95</sup>           |
| Dietary sodium reduction          | Reduce dietary sodium intake to no more than 100 mmol per day (2.4 g sodium or 6 g sodium chloride).   | 2–8 mm Hg <sup>94–96</sup>            |
| Physical activity                 | Engage in regular aerobic physical activity such as brisk walking (at least 30 minutes per day, most days of the week).  | 4–9 mm Hg <sup>97,98</sup>            |
| Moderation of alcohol consumption | Limit consumption to no more than 2 drinks (eg, 24 oz beer, 10 oz wine, or 3 oz 80-proof whiskey) per day in most men and to no more than 1 drink per day in women and lighter-weight persons. | 2–4 mm Hg <sup>99</sup>               |

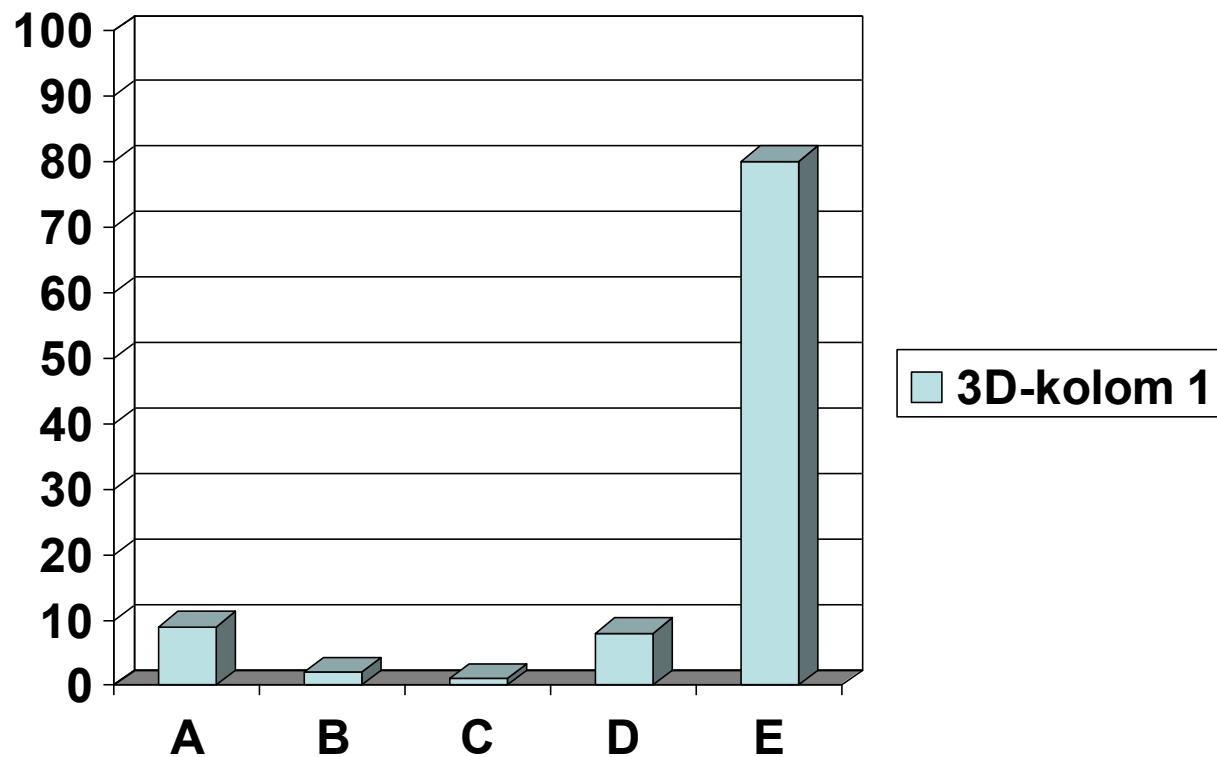
DASH indicates Dietary Approaches to Stop Hypertension.

\*For overall cardiovascular risk reduction, stop smoking.

†The effects of implementing these modifications are dose- and time-dependent and could be greater for some individuals.

**The recommendation for the therapeutic use of alcohol is questionable given the dire consequences of excessive alcohol and the thin margin between acceptable alcohol intake and worrisome alcohol intake.**

**Patients who choose to take alcohol at “acceptable” levels are probably doing so safely and may be helping to lower their blood pressures.**



# You are planning your follow-up with this patient. When do you want to see him next and why?

- |            |   |
|------------|---|
| <b>25%</b> | 1. You tell him that you want to monitor his blood pressures from home and that he should call you with his readings every month for the next 6 month                                 |
| <b>25%</b> | 2. You tell him to return in 6 months and you will check the reading again to see how he is doing with the lifestyle changes.   |
| <b>25%</b> | 3. You schedule the patient to return to see your nurse with his own blood pressure monitoring device within a few weeks. This is to verify the accuracy of his technique and device. |
| <b>25%</b> | 4. You tell him to return to your office on a weekly basis for the next 6-8 weeks for blood pressure determinations by your staff.  |

**Correct Choice :**

- C. You schedule the patient to return to see your nurse with his own blood pressure monitoring device within a few weeks. This is to verify the accuracy of his technique and device.**

**You ask that he return in 2 months to see you. In the interval, you ask that he record his blood pressure readings in a patient diary, some in the morning and some in the afternoon.**

**You want the patient to begin getting a sense of his own blood pressure and its fluctuations.**

**Some patients will want to purchase a blood pressure cuff and begin regular home monitoring. This should be encouraged but the device should be an arm cuff only and it should be compared to a calibrated and accurate device in the office. The patient's technique should be reviewed for accuracy.**

**TABLE 4. Recommendations for Follow-Up Based on Initial Blood Pressure Measurements for Adults Without Acute End Organ Damage**

| Initial Blood Pressure, mm Hg* | Follow-Up Recommended†   |
|--------------------------------|--|
| Normal                         | Recheck in 2 years   |
| Prehypertension                | Recheck in 1 year‡   |
| Stage 1 hypertension           | Confirm within 2 months‡   |
| Stage 2 hypertension           | Evaluate or refer to source of care within 1 month.<br>For those with higher pressures (eg,<br>$>180/110$ mm Hg), evaluate and treat immediately<br>or within 1 week depending on clinical situation<br>and complications. |

\*If systolic and diastolic categories are different, follow recommendations for shorter time follow-up (e.g., 160/86 mm Hg should be evaluated or referred to source of care within 1 month).

†Modify the scheduling of follow-up according to reliable information about past BP measurements, other cardiovascular risk factors, or target organ disease.

‡Provide advice about lifestyle modifications (see Lifestyle Modifications section).

## **Incorrect Choices:**

a.  
b.

**A. You tell him that you want to monitor his blood pressures from home and that he should call you with his readings every month for the next 6 months.**

**There are many home blood pressure monitoring devices, some are reliable and some not. Even those of high caliber need to be checked for accuracy.**

**Devices using the fingers or wrist are not reliable and are not recommended. Arm cuff devices are the most reliable but the cuff must be of proper size, covering 80% of the upper arm, and the measurements should be compared in the office to an accurate device.**

**If you choose to monitor this patient remotely, then you need to be certain that his blood pressure measuring technique is accurate.**

## **Incorrect Choices:**

**B. You tell him to return in 6 months and you will check the reading again to see how he is doing with the lifestyle changes.**

**b. The effective management of this patient's hypertension will depend on developing a relationship with the patient. A long follow up would be indicated only in the situation where you feel that the patient requires additional time to become accustomed to the notion of having a chronic disease.**

**You want this patient to understand the importance of daily lifestyle choices in the effective control of hypertension.**

**You are beginning a collaborative relationship**

## Incorrect Choices:

D. You tell him to return to your office on a weekly basis for the next 6-8 weeks for blood pressure determinations by your staff.

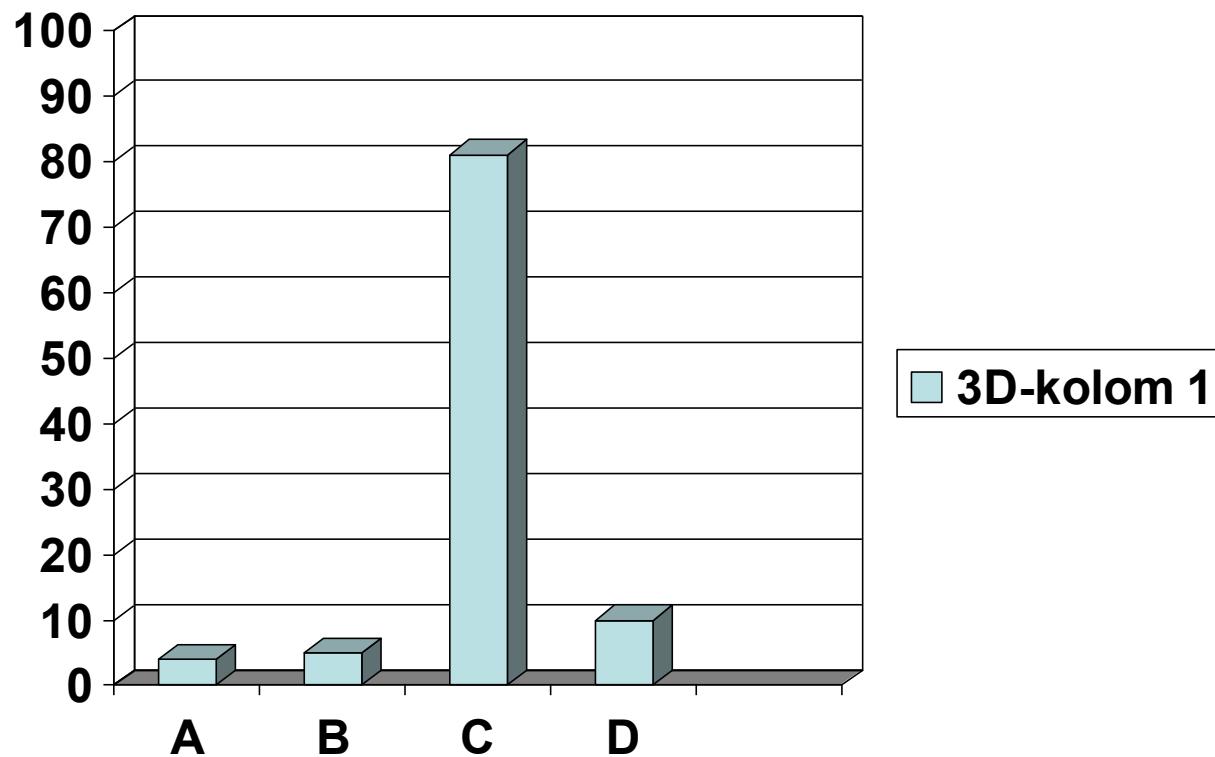
**Weekly follow up would needlessly alarm the patient about the acute risks of mildly elevated blood pressures.**

**Your goal is to effectively introduce the patient to the need for lifetime self care of a largely silent or asymptomatic condition.**

**Overemphasizing the short term risks may alienate the patient from the very long term follow up care he needs.**

**Your job is to develop an effective long-term relationship that recognizes the personality and circumstances of the individual.**

**Imposing treatments and excessively intense follow up visits is too much an assertion of provider authority and control.**



## Follow Up

**Based on your recommendations, he has shift his exercise routine to a combination of moderate resistance weight training and light jogging, 30 minutes four days a week.**

**He makes significant dietary changes such that he has begins to eat at a low fat, low salt take out restaurant when he needs fast food and eliminates many salty items from his cooking at home, including soy sauce, ketchup, and the few cold cuts he might use for a sandwich.**

**He makes progress with his smoking cessation but is not able to stop altogether.**

**He is not able to lose weight.**

**He records his blood pressures on a home device that has been checked by your office staff for accuracy. His readings continue in the 130-150/85-95 mmHg at different times of the day.**

**This patient has Stage 1 hypertension as defined by the JNC 7.**

## **Summary 1.**

- 1. The diagnosis and management of high blood pressure begins with the proper blood pressure measurement techniques and reliable and accurately calibrated measurement devices.**
- 2. Two readings must be taken in the same arm with the patient in a relaxed and seated position. The cuff should encircle 80% of the arm.**
- 3. These two readings should agree within 3-5 mmHg. If not, reposition the patient and start over.**
- 4. Both arms should be checked and the higher arm should be noted for future follow up.**
- 5. Common causes of transiently elevated blood pressure readings should be considered including:**
  - Caffeinated beverages within 20-30 minutes of blood pressure determination**
  - Cigarette smoking within 20-30 minutes of blood pressure determination**
  - The recent use of over the counter medications for the control of symptoms of allergy or acute upper respiratory illness, such as medications that include pseudoepheridrine**
  - The exam in the early hypertensive patient is generally normal though note should be made of the fundoscopic exam and the absence of any vascular damage to the carotid arteries and peripheral circulation.**

## **Summary 2.**

**6. Testing for the hypertensive patient is limited to the serum electrolytes, the BUN and creatinine, the urine analysis and the electrocardiogram (EKG).**

**7. Initial treatment for the hypertensive patient begins with the following:**

**The development of an effective working relationship. The patient will need to be motivated to take care of an asymptomatic condition with long term health consequences.**

**Salt restriction will lower blood pressures and improve the response to any subsequent pharmacologic interventions.**

**Shifting dietary composition toward a low fat and high fruit and vegetable diet will reduce blood pressure.**

**Weight loss of as little as 10 lbs. will reduce blood pressure**

**Regular exercise, 20-40 minutes of aerobic activity 3-4 times a week, will reduce blood pressure. Examples include power walking, jogging, biking, and swimming.**

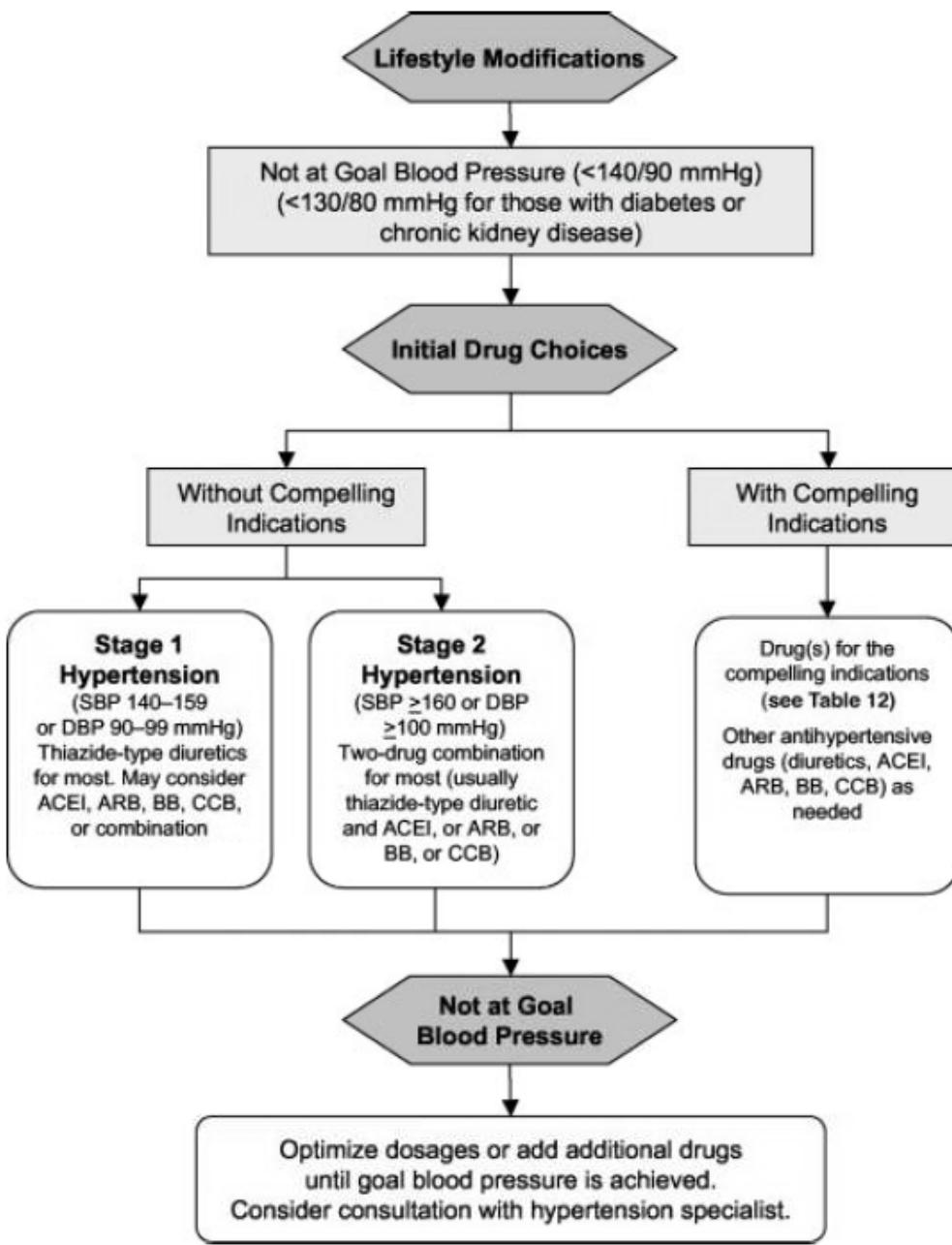


Figure 16. Algorithm for treatment of hypertension.

I Thank You