Hypertension Management Action Guide for Health Care Providers

Georgia Department of Public Health

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I. Background[1-2]

Why is hypertension Important?

Hypertension, or abnormally high blood pressure, is a leading risk factor for cardiovascular disease. In the United States, there are approximately 67 million adults who have hypertension, of whom over half do not have it under control. Among the adults whose hypertension was not under control, 14 million were unaware they had hypertension. In Georgia, over 2 million adults, or 35% of Georgia's population, have hypertension. Managing high blood pressure is important because if left uncontrolled, it can lead to other health conditions and even death. Health consequences of high blood pressure may include:

- Coronary artery disease
- Heart attack
- Heart disease
- Congestive heart failure
- Stroke
- Kidney damage
- Vision loss
- Erectile dysfunction in males

What is hypertension?

Blood pressure is the force being applied against arterial walls as the heart pumps blood throughout the body. Systolic pressure (top number) represents the force that occurs when the heart is pushing the blood out of the heart into the arteries. Diastolic pressure (bottom number) represents the pressure in the arteries when the heart is filling up with blood (i.e., the peripheral arterial tone). Essential or primary hypertension is defined as having a blood pressure reading of ≥140/90 mm Hg without a known cause (idiopathic) Hypertension is diagnosed when on at least two doctor visits, the average of two or more readings of systolic and diastolic measurements are ≥ 140 mm Hg or ≥ 90 mmHg, respectively. Essential hypertension accounts for 95% of all hypertension diagnoses in the United States.

What are common risk factors for hypertension?

The common risk factors for hypertension include the following:

- Family history of high blood pressure
- Poor diet and having too much salt in your diet
- History of smoking and second-hand smoke exposure
- Drinking too much alcohol

- Lack of physical activity
- Having diabetes
- Being overweight or obese
- African American race

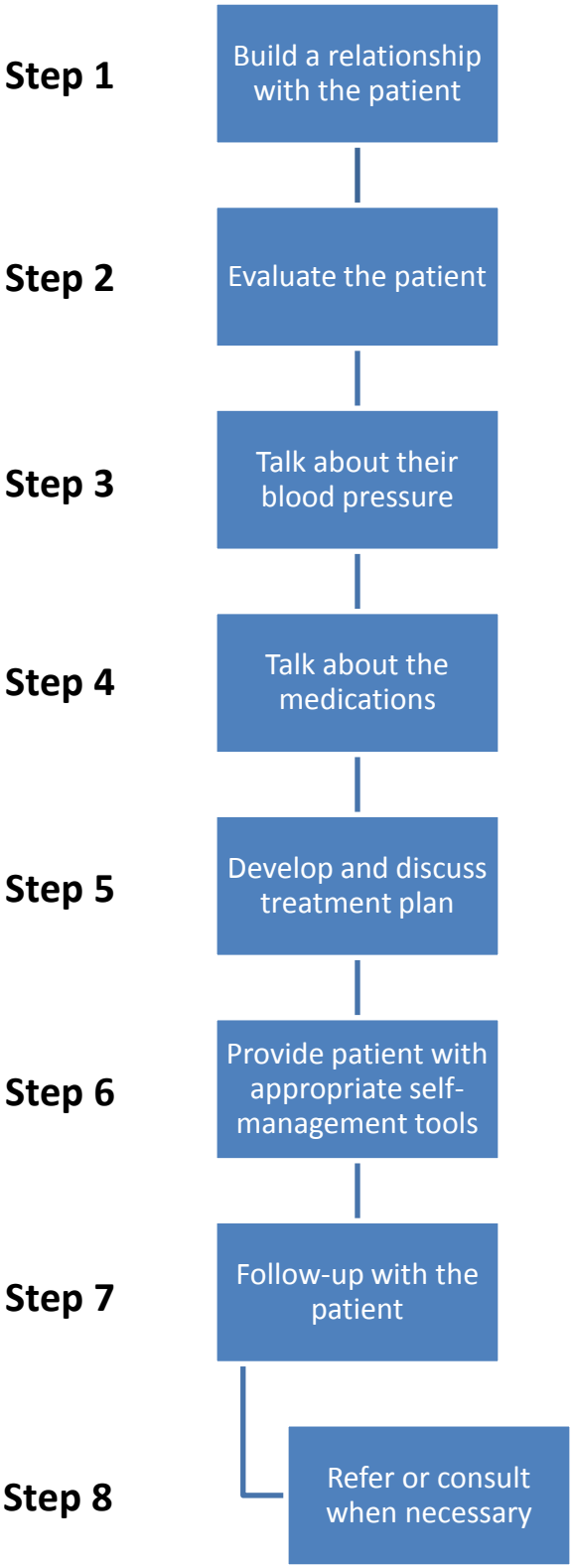
What are the symptoms of hypertension?

People who have hypertension normally will not experience symptoms. However, people experiencing a hypertensive crisis may exhibit symptoms such as:

- Severe headache
- Nosebleeds
- Changes in vision
- Nausea or vomiting
- Shortness of breath
- Confusion
- Chest pain

II. Overview: Steps of Patient Visit.

Figure 1



III. Step 1: Build a relationship with the patient.

Get to know your patients so you can 1) foster comfort and trust between yourself and the patient and 2) better understand their level of knowledge about high blood pressure and blood pressure management goals. Reinforce that you are interested, qualified and available to help them reach their blood pressure goals.

Depending upon whether this is a first visit or a follow-up visit, ask appropriate and simple questions to help you determine patients' goals and concerns and if patients understand their condition, risks, and the importance of medication adherence. The questions can be tailored to whether this is the first visit or a subsequent visit with the patient and what has already been addressed in previous visits. As examples:

- What is most important for you to accomplish during your visit today?
- What have you been doing since our last visit to control your blood pressure?
- What concerns you the most about your high blood pressure?
- Do you have any questions about watching your blood pressure at home?
- Do you have any questions about your prescriptions?
- What specifically would you like to work on to manage your high blood pressure?
- How confident are you that you could do [behavior] to help control your blood pressure?
- What might get in the way or keep you from being successful?
- What do you think would make it easier to control your high blood pressure?

IV. Step 2: Evaluate the patient[3]

A diagnosis of hypertension is based on the average of two or more properly measured, seated blood pressure readings on each of two or more office visits.

Step 2.1 **Check the blood pressure.**

Blood pressure can be measured via the following methods: 1) manually, 2) with an automated machine, 3) ambulatory blood pressure monitoring, and 4) home blood pressure monitoring.

Ambulatory blood pressure monitoring is indicated in any of the following conditions:

- Suspected white-coat hypertension
- Apparent drug resistance
- Hypotensive symptoms with antihypertensive medication
- Episodic hypertension
- Autonomic dysfunction

Manual blood pressure measurement

a. Check the condition of the device and the cuff size to ensure the reading is accurate.
b. Make sure patient is relaxed and has been seated comfortably for 5 minutes in a chair (not exam table) with feet on the floor and arm supported at heart level.
c. Have the patient relax and sit with their arm slightly bent on the same level as their heart and resting comfortably on a table or other flat surface.
d. Place the inflatable blood pressure cuff securely on the upper arm (approximately one inch above the bend of the elbow).
e. Close the pressure valve on the rubber inflating bulb, and pump the bulb rapidly to inflate the cuff.
f. If using a stethoscope, place the earpieces in your ears and the bell of the stethoscope over the artery, just below the cuff.
g. Now slowly release the pressure by twisting or pressing open the pressure valve, located on the bulb. Listen through the stethoscope and note on the dial when you first start to hear a pulsing or tapping sound—**this is the systolic blood pressure.**
h. Continue letting the air out slowly. Note on the dial when the sounds completely stop—**this is the diastolic blood pressure.**

Step 2.2 **Take a careful history.**

From a careful history, it is important to determine and discuss 1) past medical problems including history of hypertension and other chronic illnesses, 2) family history, 3) any modifiable risk factors that can worsen pre-hypertension (defined in *Step 3.1*) and/or hypertension, and 4) symptoms suggestive of end-organ damage and causes of secondary hypertension.

Table 1: Pertinent History

Past Medical History	• History of high blood pressure-duration and levels • Results and side effects of previous blood pressure treatment • Medication use (herbals, over-the-counter, oral contraceptives, steroids, NSAIDS, nasal decongestants, appetite suppressants, tricyclic anti-depressants, MAO inhibitors, cocaine, other drugs) • History of diabetes, heart disease, kidney disease, dyslipidemia, & tobacco use
Family History	• Hypertension • Premature cardiovascular disease • Cerebrovascular disease • Diabetes • Dyslipidemia

Diet and Activity History	• Dietary intake (e.g., patient's intake for each meal in the last 24 hours)
	  ○ Sodium
	  ○ Cholesterol
	  ○ Fruits and vegetables
	  ○ Whole grains
	• Physical activity level
	• Weight change

Social History	• Psychosocial stressors • Smoking/tobacco use • Substance abuse and alcohol

Review of Symptoms	• Symptoms suggestive of end-organ damage
	  ○ Stroke or transient ischemic attack
	  ○ Angina or myocardial infarction
	  ○ Heart failure
	  ○ Renal disease
	  ○ Peripheral vascular disease
	  ○ Retinopathy
	• Symptoms for causes of secondary hypertension*

*See Appendix A for further information.

Step 2.3 **Conduct a physical examination.**

The initial physical examination should include the following:

Table 2: Pertinent Physical Examination

System	Assessment
General	• **Measurement of height and weight for BMI** • **Blood pressure measurement in both arms**
Eyes/Ears/Throat	• **(Funduscopic) examination for hypertensive retinopathy** (i.e., arteriolar narrowing, hemorrhages and exudates, focal arteriolar constrictions, disc edema) • **Carotid bruits** • **Distended veins** (for volume overload) • **Enlarged thyroid gland/thyroid nodules**
Heart	• **Murmurs and clicks** • **Third and fourth heart sounds (S_3 and S_4 gallop)** • **Arrhythmias** (e.g., skipped beats, bradycardia or tachycardia, atrial fibrillation) • **Laterally displaced apical beat** • **Precordial heave** • **Unequal blood pressure in both arms**
Lungs	• **Rales** (suggestive of pulmonary edema)
Abdomen	• **Abdominal and femoral bruits** • **Abdominal masses** (e.g., abdominal aortic aneurysm) • **Abnormal aortic pulsation** • **Palpable kidneys**
Extremities	• **Diminished or absent peripheral arterial pulsations** • **Peripheral edema** • **Bruits**
Neurologic	**Complete neurologic assessment for signs/symptoms of previous or current stroke/transient ischemic attack** • **Cranial nerve exam II-XII** (facial drooping, slurred speech) • **Hyperreflexia, spasticity, and Babinski sign** • **Gait disturbances** • **Muscular atrophy** • **Reduced sensory function** (pain, temperature, light touch, proprioception)

Step 2.4 **Laboratory tests and other diagnostic procedures.**

The following tests should be ordered when evaluating patients with hypertension. Some of these tests are needed for determining presence of target organ disease and possible cause of hypertension. Others relate to cardiovascular risk factors.

<u>Recommended diagnostic testing</u>

- 12 lead electrocardiogram
- Complete blood count
- Basic metabolic profile (serum sodium, potassium, creatinine with estimated/measured glomerular filtration rate, calcium)
- Lipid profile (total cholesterol, high density lipoprotein cholesterol, low density lipoprotein cholesterol, triglycerides) after 9 to 12 hour fast
- Fasting blood glucose or Hemoglobin A1c
- Urinalysis

Other tests, based on clinical findings, could include*:

- Thyroid-stimulating hormone (TSH)
- Urinary albumin excretion or albumin/creatinine ratio
- Chest X-ray
- Heart Echocardiogram

More extensive testing for identifiable causes (e.g., for secondary hypertension) is not generally indicated unless BP control is not achieved.* ***If evaluating for secondary hypertension, refer to Appendix A.*

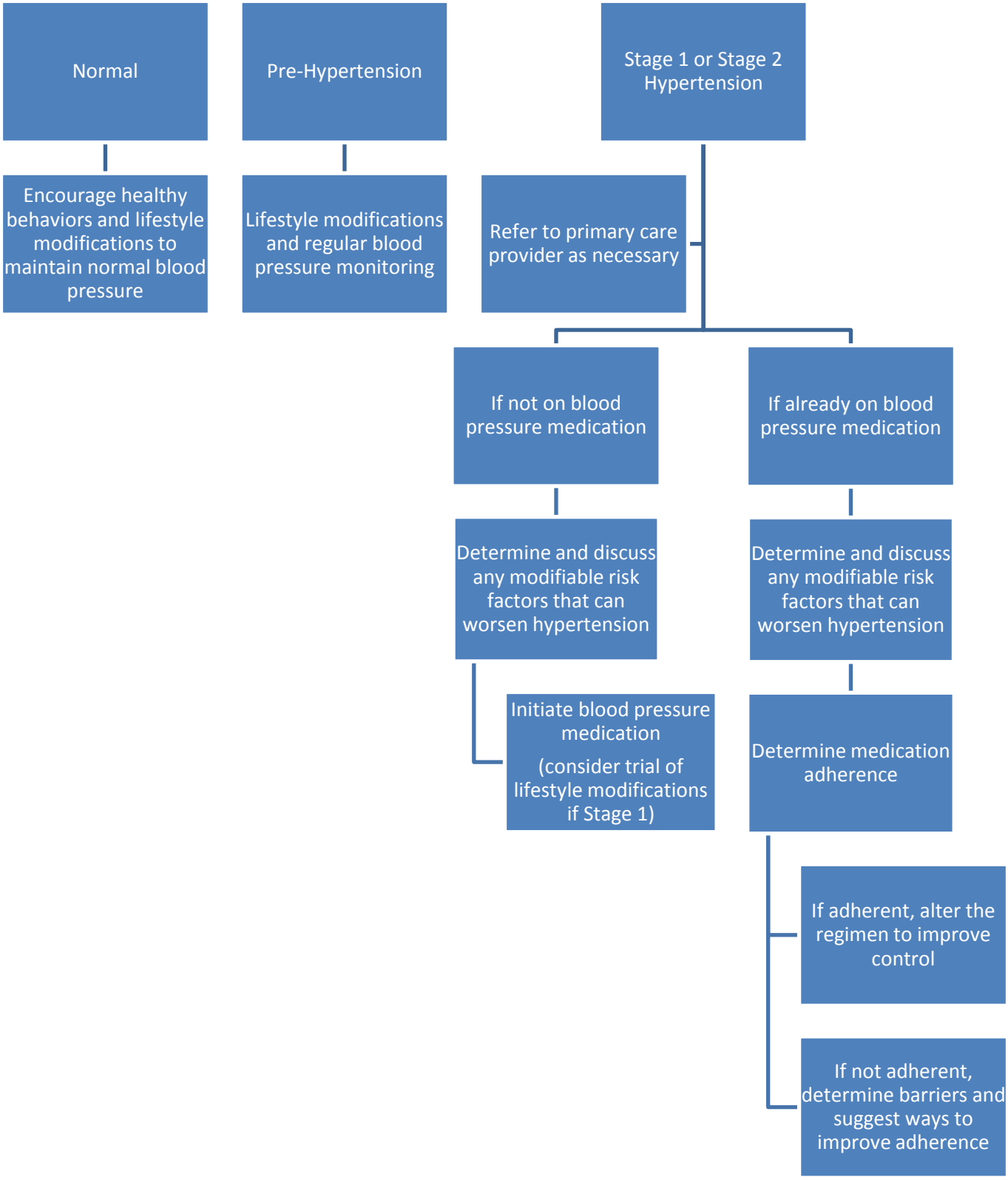
V. Step 3: Talk about their blood pressure.[3]

Step 3.1 **Discuss meaning of blood pressure readings.**

Table 3: Stages of hypertension

Stage of Hypertension	Blood pressure	General Recommendation
Normal	SBP < 120 **AND** DBP < 80 mmHg	Encourage healthy behaviors and lifestyle modifications to keep blood pressure in normal range.
Pre-Hypertension	SBP 120-139 **OR** DBP 80-89	Patient has an increased risk of future hypertension. Suggest that the patient make lifestyle modifications and regularly monitor blood pressure.
Stage I Hypertension	SBP 140-159 **OR** DBP 90-99	Patient has hypertension and should seek medical care.
Stage 2 Hypertension	SBP $\geq$ 160 **OR** DBP $\geq$ 100	

Step 3.2: Figure 2: Flowchart of Hypertension Management



VI. Step 4: Talk about their medications.[5]

Regardless of whether the person is already on medication or is just initiating treatment, it is important to address patient adherence to the medications (Step 4.1) and how taking medications can help the patient achieve their blood pressure goals. If the patient is already on medications but is not adherent, discuss strategies on how to improve adherence (Step 4.2) prior to modifying or intensifying treatment.

Step 4.1: **Assess patient adherence to blood pressure medications.**

As a health care professional, you can empower patients to take their medications as prescribed. Effective, two-way communication doubles the odds of your patients taking their medications properly. Take time to understand your patients' barriers and address them honestly to build trust.

Here is an interview guide with accompanying suggested actions (adapted from the *Pharmacist Drug Adherence Work-up (DRAW) tool*) that you can use to assess patient barriers to medication adherence.

Table 4: Interview guide to assess medication adherence[5]

Medication Adherence Interview Question	Suggested Action (If answer 'yes' to the question)
Please tell me how you take your medication every day.	• Verify adherence. • Add to their knowledge.
Do you feel like you have too many medications or too many doses/day?	• Simplify regimen (e.g., reduce number of meds per day)
Do you sometimes forget to take your medication on routine days?	• Adherence aid, alarm or specialized packaging (see *Step 4.2*). • Med calendar. • Memory aid.
Do you forget on non-routine days such as weekends or when traveling?	• Adherence aid, alarm or specialized packaging (see *Step 4.2*). • Med calendar. • Memory aid.
Are you concerned that your medication is not helping you?	• Patient education and counseling.
Do you feel that you do not need this medication?	• Patient education and counseling.
Have you had any side effects?	• Patient education and counseling. • Switch medications or adjust regimen. • Symptom management.
Are you concerned about side effects?	• Patient education and counseling. • Switch medications or adjust regimen. • Symptom management.
Is the cost of this medication too much?	• Switch to less costly medication.
What do you feel about taking medications?	• Patient education and counseling.
Pharmacists: Determine if patient has limited English language proficiency or low literacy.	• Use a translator/language line if offered in facility. • Work with case managers/social workers/ community health workers (CHWs) to engage patients on understanding how and when to take their medications.
Pharmacists: Determine if patient has mental health problems such as depression, anxiety or depression	• Refer to appropriate mental health care provider. • Work with case managers/social workers/CHWs to engage patients on understanding how and when to take their medications.

Step 4.2: **Discuss strategies through which to improve medication adherence.**

9 Actions to Improve Medication Adherence

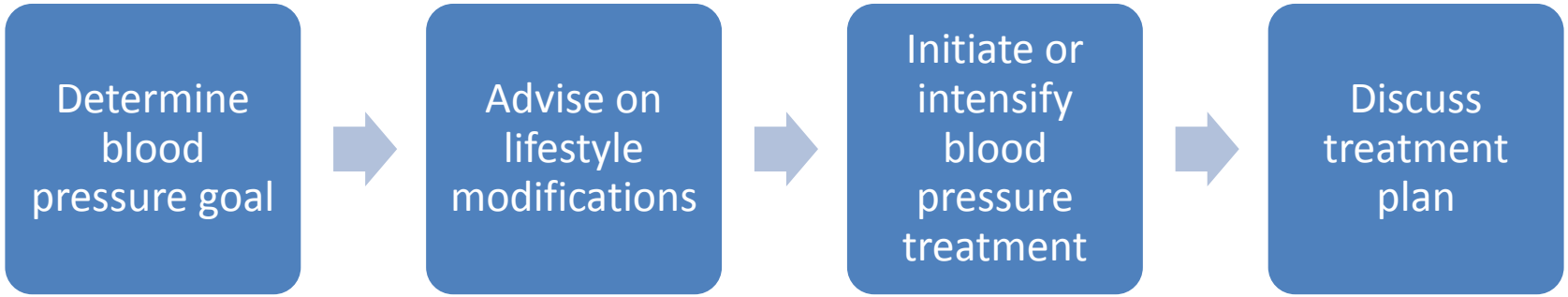
1. Use medication adherence tools:
    a. Day-of-the-week pill boxes
    b. Mobile applications
    c. Alarms
    d. Vibrating watches
    e. Prescription instruction 'refrigerator notes'
2. Work to match the action of taking the medication with a patient's daily routine (e.g., meal time or bed time, with other medications they already take properly, etc.).
3. Provide all prescription instructions clearly in writing (e.g., through prescription instruction 'refrigerator notes') and verbally
    a. Limit instructions to 3-4 major points.
    b. Use plain, culturally sensitive language.
4. Ensure patients understand their risks if they do not take medications as directed.
    a. Have patients restate the benefits and risks of taking medications.
5. Discuss with patients potential side effects of any medications when initially prescribed and at every office visit thereafter.
6. Provide rewards for medication adherence.
    a. Praise adherence.
7. Prescribe medications included in the patient's insurance coverage formulary, when possible.
8. Prescribe once daily regimens or fixed-dose combination pills.
9. Implement frequent follow-ups to ensure patients adhere to their medication regimen.
    a. Set up an automated telephone system for patient monitoring and counseling.
    b. Have designated staff personnel responsible for following up with patients.

VII. Step 5: Discuss treatment plan.[3-4]

If a patient has to begin a new treatment regimen or needs intensification of a regimen, the following four steps could be followed to initiate the treatment plan.

The four stages of the treatment plan are:

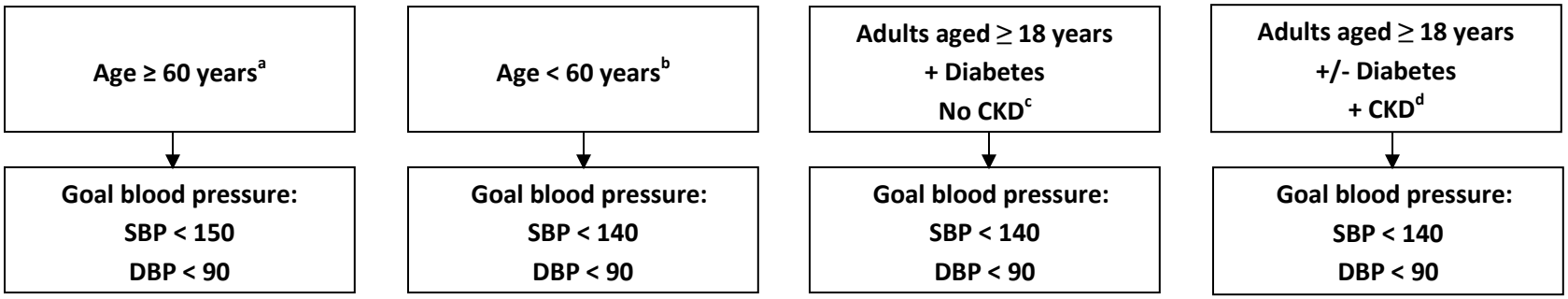
Figure 3: The four stages of the treatment plan



Step 5.1: **Determine the blood pressure goal.**

Prior to initiating treatment, it is important to set the blood pressure goal. Initiating blood pressure lowering-medications should be based on the patient's age, race, and presence of diabetes and/or chronic kidney disease. Figure 4 below displays the blood pressure treatment goals based on the above factors.

Figure 4: Blood pressure treatment goals based on patients' age, diabetes status, and chronic kidney disease status**



***Adapted from the 8th report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure.*

[a] Recommendation informed by the following trials: HYVET, Syst-Eur, SHEP, JATOS, VALISH, and CARDIO-SIS.[6-11]

[b] Recommendation informed by the following trials: HDFP, Hypertension-Stroke Cooperative, MRC, ANBP, and VA Cooperative.[12-17]

[c] Recommendation informed by the following trials: SHEP, Syst-Eur, UKPDS, and Accord-BP.[18-21]

[d] Recommendation informed by the following trials: AASK, MDRD, and REIN-2.[22-24]

Step 5.2: **Discuss lifestyle modifications.**[3, 25-27]

Discuss the types of behavior modifications that can be implemented to control hypertension. Table 5 below provides as list of recommended modifications that have been shown to help decrease systolic blood pressure. Based on the patient's history, discuss the appropriate lifestyle modifications.

Table 5: Recommendations for Lifestyle Modifications to Control Hypertension

Lifestyle Modification	Recommendation
Reduce weight	Maintain normal body weight (body mass index 18.5–24.9 kg/m^2)
Adopt DASH eating plan[a]	Consume a diet rich in fruits, vegetables, and low-fat dairy products with a reduced content of fat (e.g., saturated and total fat) and cholesterol.
Reduce dietary sodium	Reduce dietary sodium intake to less than 2,300 mg of sodium a day. For persons who are $\geq$ 51 years of age, black, and/or have hypertension, diabetes, and chronic kidney disease, reduce sodium to less than 1,500 mg per day.[b]
Increase physical activity	Engage in regular aerobic physical activity such as brisk walking for at least 30 min per day, most days of the week. This may be broken down into shorter time intervals such as 10 minutes.[c]
Moderate alcohol consumption	Limit consumption to no more than 2 drinks (e.g. 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.
Quit smoking	Encourage patients to quit smoking. Refer patients to the quit smoking phone line where they can talk with a counselor for help with quitting smoking: 1-877-44U-QUIT or 1-877-270-STOP (Georgia quit line).

[a]DASH – Dietary Approaches to Stop Hypertension; for specific recommendations, go to: http://www.nhlbi.nih.gov/health/public/heart/hbp/dash/index.htm

[b] For more information about this recommendation, go to: http://www.health.gov/dietaryguidelines/dga2010/DietaryGuidelines2010.pdf.

[c] For more information about this recommendation, go to: http://www.health.gov/PAGuidelines.

Step 5.3: **Initiate or intensify blood pressure treatment.**[3-4]

Step 5.3.1: **Blood pressure treatment for adults ≥ 60 years.**

After determining the appropriate blood pressure goal that the patient should be at and after having discussed appropriate lifestyle modifications, the next step would be to determine if the patient should be initiated on treatment and what that treatment(s) is.

Figure 5 displays the 3-step process of initiating/intensifying blood pressure treatment.

Figure 6 displays the treatment algorithm for adults < 60 years that can be used to determine how to initiate and intensify blood pressure treatment and the frequency of follow-up blood pressure visits for a patient with hypertension.

Table 6 displays the different dosing strategies that can be considered. *Strategy C, or the two-drug initiation plan, is typically considered for patients in Stage 2 hypertension.*

Table 7 displays the initial doses and target doses of some commonly used anti-hypertensive medications.

Treatment initiation for adults ≥ 60 years is discussed further in Step 5.3.1.

> ***Important Note***
>
> Deciding which medications to use are based on multiple factors including age, race, cost, drug interactions, side effects, quality of life issues, patient preference of dosing frequency and availability in the pharmacy formulary.

Figure 5: The 3-step process of treatment initiation

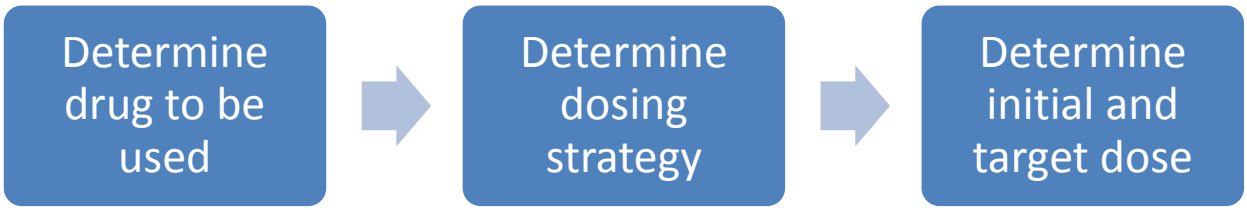
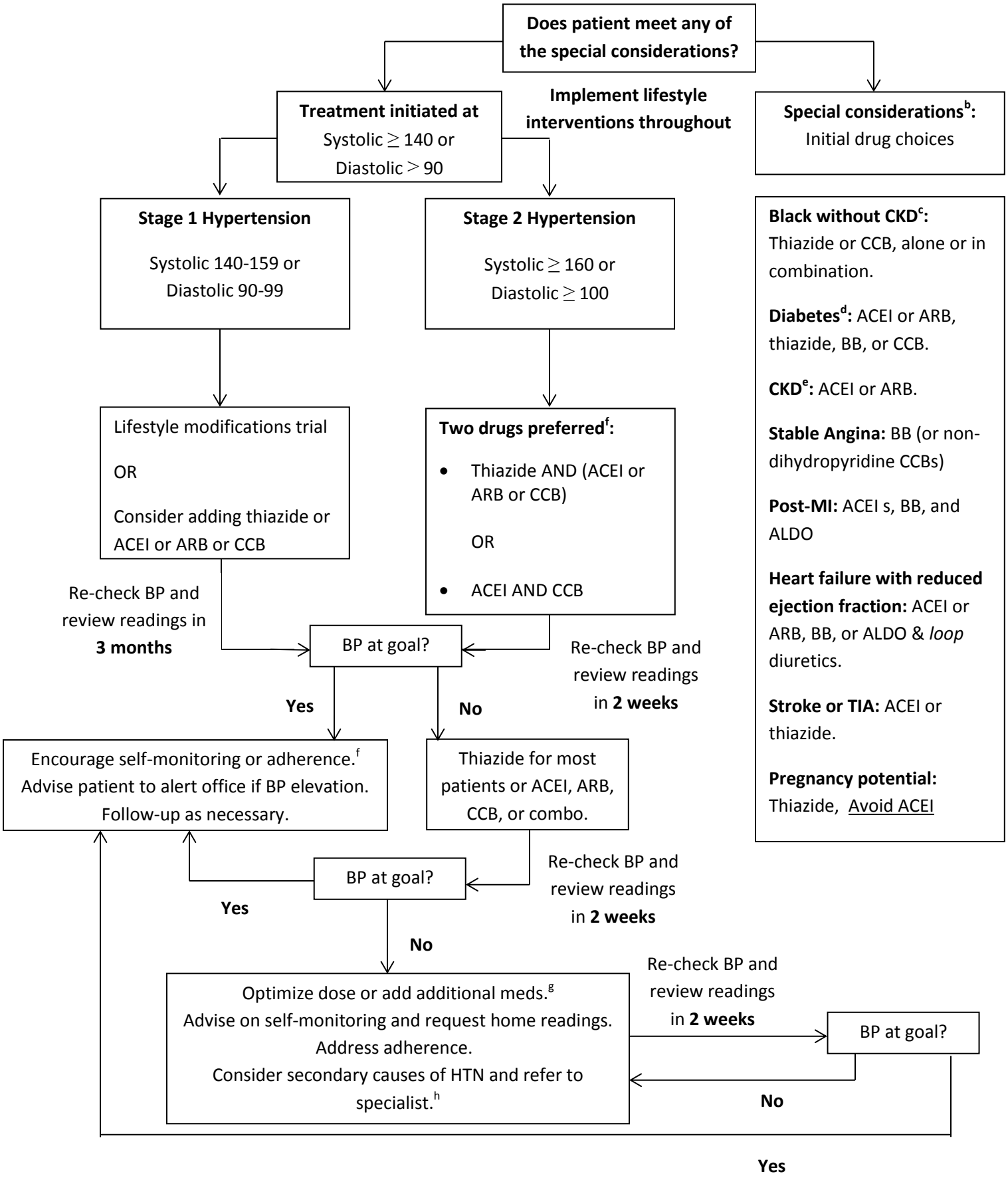


Figure 6: BP Treatment Initiation Algorithm for Adults < 60 years[a]



[a] Drug abbreviations: ACEI: Angiotensin-converting enzyme inhibitor; ARB: Angiotensin receptor blocker; CCB: Calcium channel blocker ; BB: Beta-blocker; ALDO: Aldosterone receptor blocker.

[b] Consult with patient's primary care provider if there is any uncertainty on what anti-hypertensive medications to initiate given special considerations.

[c] In general, the treatment of BP is similar for all demographic groups. However, the prevalence, severity and impact of hypertension is increased among the black population. Further, black adults demonstrate reduced BP responses to BB, ACEI, or ARBS compared to diuretics or CCBs.

[d] For patients with diabetes, thiazides diuretics, ACEI, ARBs, and CCBS are *all* beneficial in reducing CVD and stroke incidence. However, ACEI and ARB-based treatments also favorably affect the progression of diabetic nephropathy and reduce albuminuria, and ARBS reduce progression to macro-albuminuria. Hence, ACEI and ARBs should be first considered when starting a diabetic patient on anti-hypertensive medications.

[e] In black patients with CKD **with proteinuria**, an ACEI or ARB is recommended as initial therapy because of the higher likelihood of progression to ESRD. If black patients with CKD but **without proteinuria**, the choice for initial therapy includes a thiazide-type diuretic, CCB, ACEI, or ARB.

[f] The two drug initiation therapy strategy involves initiating therapy with two different anti-hypertensive drugs, either as 2 separate drugs or a single pill combination.

[g] When considering adding additional medications, begin adding from within the four classes of first-line medications: thiazides, ACEI, ARBs, and CCB.

[h] Consider secondary causes of hypertension if patient requires more than three anti-hypertensive medications from three different classes. Refer to **Appendix A** for evaluation of secondary causes of hypertension. **Management of secondary causes of hypertension should be coordinated with the primary care provider and appropriate specialist.**

Table 6: Strategies to Dose Antihypertensive Drugs

Strategy	Description	Additional comments
A	Start with one drug, titrate to maximum dose, and then add a second drug.	
B	Start with one drug and then add a second drug before achieving maximum dose of initial drug.	Then titrate up to maximum dose of both drugs before considering adding a third agent.
C[a]	Begin with two drugs at the same time, either as 2 separate pills or as a single pill combination.	Typical dosing strategy in Stage 2 hypertension.

***Adapted from the JNC-8 guidelines.*

[a] When adding a second or third agent, choose drugs from among the 4 classes of first line therapy prior to choosing from other classes: thiazides, ACEI, ARBS, or CCB.

Table 7: Commonly used hypertension medications

	Initial daily dose (mg)	Target dose (mg)	No of doses/day
ACE inhibitors			
Captopril	50	150-200	2
Enalapril	5	20	1-2
Lisinopril	10	40	1
Angiotensin receptor blockers			
Eprosartan	400	600-800	1-2
Candesartan	4	12-32	1
Losartan	50	100	1-2
Valsartan	40-80	160-320	1
Irbesartan	75	300	1
Beta-blockers			
Atenolol	25-50	100	1
Metoprolol	50	100-200	1-2
Calcium channel blockers			
Amlodipine	2.5	10	1
Diltiazem extended release	120-180	360	1
Nitrendipine	10	20	1-2
Thiazide-type diuretics			
Bendroflumethiazide	5	10	1
Chlorthalidone	12.5	12.5-25	1
Hydrochlorothiazide	12.5-25	25-100[a]	1-2
Indapamide	1.25	1.25-2.5	1

***Adapted from the JNC-8 guidelines.*

Step 5.3.2: **Blood pressure treatment for adults ≥ 60 years.**

For adults ≥ 60 years, treatment is initiated at **systolic BP ≥ 150 or diastolic BP ≥ 90** with the goal of treating below these cut-off values. Treatment type (taking into account special considerations), dosing strategy and initial and target doses are similar to Tables 6 & 7 displayed above. However, if pharmacologic treatment for high BP results in lower achieved systolic BP (for example, < 140) and treatment is not associated with adverse effects on health or quality of life, treatment does *not* need to be adjusted.[4]

Step 5.4: **Discuss treatment plan with patient.**

After developing the treatment plan for your patient, it is important to discuss the treatment plan in detail with the patient. *At this point, it may be also helpful to re-emphasize the lifestyle modifications that the patient could make.*

Aspects of the treatment plan that should be emphasized with the patient include:

- The unique role of each drug
- The importance of taking the drug as directed and making sure that they are refilled
- How often the drug should be taken
- When to avoid taking the drug (e.g., before a meal, with other medications, etc.)
- Any possible side effects
- Suggest ways to manage side effects
- Emphasize danger of not taking medications as prescribed
- Address possible adherence issues that may arise (refer to Step 4)

Important Note

After thoroughly discussing the treatment plan with the patient, have the patient repeat the information back to you in his or her own words to make sure that they understand the plan.

VIII. Step 6: Provide patient with appropriate hypertension self-management tools.[28]

Discuss a plan with the patient to manage their blood pressure outside of the clinical setting and provide the patient with the appropriate self-management tools.

Components of this plan include:

a. Monitoring the blood pressure outside of the home with an appropriate device.

Discuss a plan for patients to regularly monitor their blood pressure outside of the clinical setting (e.g., twice a day). **For at least one week, suggest that the patient checks their blood pressure twice per day** – once in the morning before they take their medications and once in the evening. If the patient is unable to afford a home blood pressure monitoring device, other settings that the patient may be able to monitor their blood pressure include the health care facility, the local public health agency, senior center, pharmacy, church, fire station, or local grocery stores. **Make sure patients know their blood pressure goals**.

- Tools:
  - Home blood pressure monitoring instructions

b. Recording the blood pressure.

Have the patient record their blood pressure on a standardized form which can be reviewed in subsequent visits.

- Tools:
  - Blood pressure monitoring journal
  - Blood pressure tracker with target numbers written prominently

c. Following the appropriate lifestyle modifications.

- Tools:
  - Healthy diet information
  - Low-sodium diet information
  - Community options for exercise
  - Websites for additional reading and information

d. Discuss any support systems or community resources in place to assist in controlling blood pressure.

Mention any support systems in place for patients who have any questions about their blood pressure numbers and monitoring while outside the clinical setting.

- Examples include:
  - One-on-one counseling with nurses or community pharmacists
  - Interactive computer-based telephone feedback system
  - Web communications or telephonic support
  - Education or small-group classes on self-measured blood pressure technique and medication management

e. Provide the patient with a written self-management plan at the end of the office visit.

- Tools:
  - Print visit summaries and follow-up guidance for patients

** For more information, please refer to the Million Hearts™ *Self-measurement Blood Pressure Monitoring Action Steps for Public Health Practitioners.*[3]

IX. Step 7: Follow-up with the patient.[3, 29]

A critical component of the visit is that an appropriate follow-up plan is discussed with the patient. The algorithm above in Figure 6 provides an idea of how frequently a patient should have office visits to monitor BP following initiation of a treatment plan. Discuss with the patient that they may be receiving reminders via phone, mail, e-mail or text messages between their office visits about a) medications, b) monitoring their blood pressure at home, and c) upcoming scheduled office visits.

***Step 7.1*: Determine when the next clinic appointment shall be.**

When initiating patient on drug therapy → see patient approximately **every 2-4 weeks.**

If patient is making progress → move to **4-6 week intervals**.

When the patient has gained control → move to **2-4 month intervals**.

***Step 7.2:* During the period *between* visits.**

a. Have patients be called, sent mail or e-mail (e.g., through a patient portal system) or text messages by appropriate clinic personnel about taking their a) medications, b) monitoring their blood pressure at home, and c) scheduled office visits. The method of sending these reminders can be based on both clinic capacity and patient preference.
b. Have patients be contacted by appropriate clinic personnel to confirm upcoming appointments and instruct them to bring their a) medications, b) a medication list, and c) home blood pressure readings with them to the visit.
c. With these follow-up reminders, re-emphasize any customized advice (e.g., medication dosing, lifestyle modifications, self-monitoring blood pressure reminders, etc.) relevant to the patient.
d. If applicable, encourage patients to use smartphone or Web-based applications to track and share home blood pressure measurements.

***Step 7.3:* At the scheduled follow-up visit.**

In addition to following the appropriate steps in this protocol,

a. Review readings from the home blood pressure monitoring journal with the patient.
b. Discuss any side effects/symptoms from the medications.
c. Discuss any problems with adhering to the medications and/or lifestyle modifications.

d. Review any ER/hospital visits since the last visit.
e. If appropriate, check patient's home monitoring devices for accuracy.
f. If appropriate, train patients on proper use of home blood pressure monitors.
g. If patient prefers to monitor blood pressure outside of his/her home (e.g., fire stations, supermarkets, etc.), re-emphasize possible venues where blood pressure monitoring stations are available for checking blood pressure. Such venues include:
    i. Medical clinics
    ii. The local public health agency
    iii. Supermarkets
    iv. Pharmacies
    v. Fire stations
    vi. EMS agencies
h. Order routine follow-up lab studies to determine effect of therapy or when there are symptoms or complaints of any problems

Table 8: Pertinent lab tests to order at follow-up

1 month	3 months	6-12 months	12 months	5 years
Creatinine (if on ACEI)[a]	Potassium and sodium (if on diuretic therapy)	Potassium and sodium (if on diuretic therapy)	Lipid profile CBC Fasting blood glucose BUN/creatinine Calcium Hemoglobin A1c (if diabetic) Urinalysis	ECG

[a] If serum creatinine elevates to 1.4 mg/dL or greater for women or 1.5 mg/dL or greater for men, consult with a hypertension specialist for recommendation of continued therapy and refer patient to specialist.

X. Step 8: Refer or consult with appropriate specialists when necessary.

Necessary referrals:

Every patient, at the minimum, should have a referral to a registered dietitician or a public health nutritionist, if available.

As needed referrals:

Pharmacist for further medication counseling
Health educator

Primary care provider or hypertension specialist:

Initial systolic BP ≥ 180
Initial diastolic BP ≥ 110
Abnormal lab results
- Total cholesterol ≥ 200
- LDL cholesterol ≥ 130 or ≥ 100 in a patient with diabetes
- HDL ≤ 40
- Triglycerides ≥ 200
- Creatinine ≥ 1.4 for women or ≥ 1.5 for men
- Potassium ≤ 3.5 mEq or ≥ 5.5 mEq
- Positive microalbuminuria

Extreme complications/side effects of therapy.
Patient does not respond to therapy.
Patient is pregnant.
Patient is ≤ 18 years old.
Patient has an abnormal ECG.
Patient has any abnormal physical examination findings.

XI. Appendix A: Evaluation of Secondary Causes of Hypertension

Secondary hypertension implies that a patient's blood pressure elevation results from an underlying disease process. Although they account for a small percentage of all documented cases of hypertension, their detection is important since appropriate intervention can cure the disease and reverse the hypertension. **Management of secondary causes of hypertension should be coordinated with the primary care provider and appropriate specialist.**

Suspect secondary causes of hypertension in the following circumstances:

- Abrupt onset of symptomatic hypertension
- Stage 2 hypertension
- Hypertensive crisis
- Sudden loss of blood pressure control after many years of stability on drug therapy
- Drug resistant hypertension
- Individuals with no family history of hypertension

Table 9: Differential diagnosis for secondary causes of hypertension

Diagnosis	Signs/symptoms	Options for further evaluation
Renovascular hypertension	Variable, may be absent	Consult with specialist
Sleep apnea	Excessive daytime sleepiness, obesity	History, sleep study
Primary hyperaldosteronism	Unprovoked hypokalemia	Plasma renin/aldosterone ratio 24-hour urine aldosterone
Aortic coarctation	Unequal blood pressure in right and left arms, delayed or absent femoral pulses	Consult with specialists for appropriate testing (e.g., aortic imaging)
Cushing syndrome	Striae, moon facies, buffalo hump, truncal obesity	Dexamethasone suppression test 24-hour urine free cortisol
Pheochromocytoma	Palpitations and paroxysmal symptoms	24-hour urine metanephrines and normetanephrines Plasma free metanephrines
Thyroid disease	Variable	TSH
Parathyroid disease	Hypercalcemia	PTH
Drug-induced	Variable	History, urine toxin screen

***Adapted from Institute for Clinical Symptoms Improvement Health Care Guideline: Hypertension Diagnosis and Treatment.*

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