

HealthPartners Care Coordination
Clinical Care Planning and Resource Guide
HYPERTENSION

The following evidence-based guideline was used in developing this clinical care guide: National Institute of Health (NIH) and Journal of the American Medical Association (JAMA).

Documented Health Condition: Hypertension

What is Hypertension?

Blood pressure is the force of blood pushing against the walls of the arteries as the heart pumps blood. High blood pressure, sometimes called hypertension, happens when this force is too high.

Systolic Pressure: blood pressure when the heart beats while pumping blood

Diastolic Pressure: blood pressure when the heart is at rest between beats

Normal blood pressure for adults is defined as a systolic pressure below 120 mmHg and a diastolic pressure below 80 mmHg. It is normal for blood pressures to change when you sleep, wake up, or are excited or nervous. When you are active, it is normal for your blood pressure to increase. However, once the activity stops, your blood pressure returns to your normal baseline range.

There are two main types of high blood pressure: primary and secondary high blood pressure.

Primary, or essential, high blood pressure is the most common type of high blood pressure. This type of high blood pressure tends to develop over years as a person ages.

Secondary high blood pressure is caused by another medical condition or use of certain medicines. This type usually resolves after the cause is treated or removed.

Common Causes of Hypertension

Changes, either from [genes](#) or the environment, in the body's normal functions may cause high blood pressure, including changes to kidney fluid and salt balances, the [renin-angiotensin-aldosterone system](#), [sympathetic nervous system](#) activity, and blood vessel structure and function.

HealthPartners Care Coordination
Clinical Care Planning and Resource Guide
HYPERTENSION

Biology and High Blood Pressure

Researchers continue to study how various changes in normal body functions cause high blood pressure. The key functions affected in high blood pressure include:

[Kidney fluid and salt balances](#)

[Renin-angiotensin-aldosterone system](#)

[Sympathetic nervous system activity](#)

[Blood vessel structure and function](#)

Kidney Fluid and Salt Balances

The kidneys normally regulate the body's salt balance by retaining sodium and water and excreting potassium. Imbalances in this kidney function can expand blood volumes, which can cause high blood pressure.

Renin-Angiotensin-Aldosterone System

The renin-angiotensin-aldosterone system makes angiotensin and aldosterone [hormones](#). Angiotensin narrows or constricts blood vessels, which can lead to an increase in blood pressure. Aldosterone controls how the kidneys balance fluid and salt levels. Increased aldosterone levels or activity may change this kidney function, leading to increased blood volumes and high blood pressure.

Sympathetic Nervous System Activity

The sympathetic nervous system has important functions in blood pressure regulation, including heart rate, blood pressure, and breathing rate. Researchers are investigating whether imbalances in this system cause high blood pressure.

Blood Vessel Structure and Function

Changes in the structure and function of small and large arteries may contribute to high blood pressure. The angiotensin pathway and the immune system may stiffen small and large arteries, which can affect blood pressure.

HealthPartners Care Coordination Clinical Care Planning and Resource Guide **HYPERTENSION**

Genetic Causes of High Blood Pressure

Much of the understanding of the body systems involved in high blood pressure has come from genetic studies. High blood pressure often runs in families. Years of research have identified many genes and other mutations associated with high blood pressure, some in the renal salt regulatory and renin-angiotensin-aldosterone pathways. However, these known genetic factors only account for 2 to 3 percent of all cases. Emerging research suggests that certain [DNA](#) changes during fetal development also may cause the development of high blood pressure later in life.

Environmental Causes of High Blood Pressure

Environmental causes of high blood pressure include [unhealthy lifestyle habits](#), being [overweight or obese](#), and some [medicines](#).

Unhealthy Lifestyle Habits

Unhealthy lifestyle habits can cause high blood pressure, including:

- High dietary sodium intake and sodium sensitivity
- Drinking excess amounts of alcohol
- Lack of physical activity

Overweight and Obesity

Research studies show that being overweight or obese can increase the resistance in the blood vessels, causing the heart to work harder and leading to high blood pressure.

Medicines

Prescription medicines such as asthma or hormone therapies, including birth control pills and estrogen, and over-the-counter medicines such as cold relief medicines may cause this form of high blood pressure. This happens because medicines can change the way your body controls fluid and salt balances, cause your blood vessels to constrict, or impact the renin-angiotensin-aldosterone system leading to high blood pressure.

HealthPartners Care Coordination
Clinical Care Planning and Resource Guide
HYPERTENSION

Other Medical Causes of High Blood Pressure

Other medical causes of high blood pressure include other medical conditions such as [chronic kidney disease](#), [sleep apnea](#), thyroid problems, or certain tumors. This happens because these other conditions change the way your body controls fluids, sodium, and hormones in your blood, which leads to secondary high blood pressure.

Diagnosis and Clinical Indicators

For most patients, health care providers diagnose high blood pressure when blood pressure readings are consistently 140/90 mmHg or above.

A [blood pressure test \(link is external\)](#) is easy and painless and can be done in a health care provider's office or clinic. To prepare for the test:

- Don't drink coffee or smoke cigarettes for 30 minutes prior to the test.
- Go to the bathroom before the test.
- Sit for 5 minutes before the test.

To track blood pressure readings over a period of time, the health care provider may ask you to come into the office on different days and at different times to take your blood pressure. The health care provider also may ask you to check readings at home or at other locations that have blood pressure equipment and to keep a written [log](#) of all your results.

Whenever you have an appointment with the health care provider, be sure to bring your log of blood pressure readings. Every time you visit the health care provider, he or she should tell you what your blood pressure numbers are; if he or she does not, you should ask for your readings.

Blood Pressure Severity and Type

Your health care provider usually takes 2–3 readings at several medical appointments to diagnose high blood pressure. Using the results of your blood pressure test, your health care provider will diagnose prehypertension or high blood pressure if:

- Your systolic or diastolic readings are consistently higher than 120/80 mmHg.

HealthPartners Care Coordination
Clinical Care Planning and Resource Guide
HYPERTENSION

- Your child’s blood pressure numbers are outside [average numbers for children of the same age, gender, and height](#).

Once your health care provider determines the severity of your blood pressure, he or she can order additional tests to determine if your blood pressure is due to other conditions or medicines or if you have primary high blood pressure. Health care providers can use this information to develop your [treatment](#) plan.

Signs and Symptoms of Hypertension

Because diagnosis is based on blood pressure readings, this condition can go undetected for years, as symptoms do not usually appear until the body is damaged from chronic high blood pressure.

Most people with high blood pressure have no signs or symptoms, even if blood pressure readings reach dangerously high levels. A few people with high blood pressure may have headaches, shortness of breath or nosebleeds, but these signs and symptoms aren't specific and usually don't occur until high blood pressure has reached a severe or life-threatening stage.

Complications of High Blood Pressure

When blood pressure stays high over time, it can damage the body and cause complications. Some common complications and their signs and symptoms include:

- **Aneurysms**: When an abnormal bulge forms in the wall of an artery. Aneurysms develop and grow for years without causing signs or symptoms until they rupture, grow large enough to press on nearby body parts, or block blood flow. The signs and symptoms that develop depend on the location of the aneurysm.
- **Chronic Kidney Disease**: When blood vessels narrow in the kidneys, possibly causing kidney failure.
- **Cognitive Changes**: Research shows that over time, higher blood pressure numbers can lead to cognitive changes. Signs and symptoms include memory loss, difficulty finding words, and losing focus during conversations.
- **Eye Damage**: When blood vessels in the eyes burst or bleed. Signs and symptoms include vision changes or blindness.
- **Heart Attack**: When the flow of oxygen-rich blood to a section of heart muscle suddenly becomes blocked and the heart doesn't get oxygen. The most common warning symptoms of a heart attack are chest pain or discomfort, upper body discomfort, and shortness of breath.
- **Heart Failure**: When the heart can't pump enough blood to meet the body's needs. Common signs and symptoms of heart failure include shortness of breath or trouble breathing; feeling tired; and swelling in the ankles, feet, legs, abdomen, and veins in the neck.

HealthPartners Care Coordination
Clinical Care Planning and Resource Guide
HYPERTENSION

- **Peripheral Artery Disease**: A disease in which plaque builds up in leg arteries and affects blood flow in the legs. When people have symptoms, the most common are pain, cramping, numbness, aching, or heaviness in the legs, feet, and buttocks after walking or climbing stairs.
- **Stroke**: When the flow of oxygen-rich blood to a portion of the brain is blocked. The symptoms of a stroke include sudden onset of weakness; paralysis or numbness of the face, arms, or legs; trouble speaking or understanding speech; and trouble seeing.

Treatment and Self-Care

Based on your diagnosis, health care providers develop treatment plans for high blood pressure that include lifelong lifestyle changes and medicines to control high blood pressure; lifestyle changes such as weight loss can be highly effective in treating high blood pressure.

Treatment Plans

Health care providers work with you to develop a treatment plan based on whether you were [diagnosed](#) with primary or secondary high blood pressure and if there is a suspected or known [cause](#). Treatment plans may evolve until blood pressure control is achieved.

If your health care provider diagnoses you with secondary high blood pressure, he or she will work to treat the other condition or change the medicine suspected of causing your high blood pressure. If high blood pressure persists or is first diagnosed as primary high blood pressure, your treatment plan will include [lifestyle changes](#). When lifestyle changes alone do not control or lower blood pressure, your health care provider may change or update your treatment plan by prescribing [medicines](#) to treat the disease. Health care providers prescribe children and teens medicines at special doses that are safe and effective in children.

If your health care provider prescribes medicines as a part of your treatment plan, keep up your healthy lifestyle habits. The combination of the medicines and the healthy lifestyle habits helps control and lower your high blood pressure.

Some people develop “resistant” or uncontrolled high blood pressure. This can happen when the medications they are taking do not work well for them or another medical condition is leading to uncontrolled blood pressure. Health care providers treat resistant or uncontrolled high blood pressure with an intensive treatment plan that can include a different set of blood pressure medications or other special treatments.

HealthPartners Care Coordination
Clinical Care Planning and Resource Guide
HYPERTENSION

To achieve the best control of your blood pressure, follow your treatment plan and take all medications as prescribed. Following your prescribed treatment plan is important because it can prevent or delay complications that high blood pressure can cause and can lower your risk for other related problems.

Healthy Lifestyle Changes

Healthy lifestyle habits can help you control high blood pressure. These habits include:

- [Healthy eating](#)
- [Being physically active](#)
- [Maintaining a healthy weight](#)
- [Limiting alcohol intake](#)
- [Managing and coping with stress](#)

To help make lifelong lifestyle changes, try making one healthy lifestyle change at a time and add another change when you feel that you have successfully adopted the earlier changes. When you practice several healthy lifestyle habits, you are more likely to lower your blood pressure and maintain normal blood pressure readings.

Healthy Eating

To help treat high blood pressure, health care providers recommend that you limit sodium and salt intake, increase potassium, and eat foods that are heart healthy.

Limiting Sodium and Salt

A low-sodium diet can help you manage your blood pressure. You should try to limit the amount of sodium that you eat. This means choosing and preparing foods that are lower in salt and sodium. Try to use low-sodium and “no added salt” foods and seasonings at the table or while cooking. Food labels tell you what you need to know about choosing foods that are lower in sodium. Try to eat no more than 2,300 mg sodium a day. If you have high blood pressure, you may need to restrict your sodium intake even more.

HealthPartners Care Coordination
Clinical Care Planning and Resource Guide
HYPERTENSION

Your health care provider may recommend the Dietary Approaches to Stop Hypertension (DASH) eating plan if you have high blood pressure. The DASH eating plan focuses on fruits, vegetables, whole grains, and other foods that are heart healthy and low in fat, cholesterol, and salt.

The DASH eating plan is a good heart-healthy eating plan, even for those who don't have high blood pressure. Read more about the [DASH](#) eating plan.

Heart-Healthy Eating

Your health care provider also may recommend heart-healthy eating, which should include:

- Whole grains
- Fruits, such as apples, bananas, oranges, pears, and prunes
- Vegetables, such as broccoli, cabbage, and carrots
- Legumes, such as kidney beans, lentils, chick peas, black-eyed peas, and lima beans
- Fat-free or low-fat dairy products, such as skim milk
- Fish high in omega-3 fatty acids, such as salmon, tuna, and trout, about twice a week

When following a heart-healthy diet, you should avoid eating:

- A lot of red meat
- Palm and coconut oils
- Sugary foods and beverages

In the National Heart, Lung, and Blood Institute (NHLBI)-sponsored [Hispanic Community Health Study/Study of Latinos](#), which studied Hispanics living in the United States, Cubans ate more sodium and Mexicans ate less sodium than other Hispanic groups in the study. All Hispanic Americans should follow these healthy eating recommendations even when cooking traditional Latino dishes. Try some of these popular [Hispanic American heart-healthy recipes](#).

Being Physically Active

HealthPartners Care Coordination Clinical Care Planning and Resource Guide **HYPERTENSION**

Routine physical activity can lower high blood pressure and reduce your risk for other health problems. Talk with your health care provider before you start a new exercise plan. Ask him or her how much and what kinds of physical activity are safe for you.

Everyone should try to participate in moderate-intensity aerobic exercise at least 2 hours and 30 minutes per week, or vigorous-intensity aerobic exercise for 1 hour and 15 minutes per week. Aerobic exercise, such as brisk walking, is any exercise in which your heart beats harder and you use more oxygen than usual. The more active you are, the more you will benefit. Participate in aerobic exercise for at least 10 minutes at a time, spread throughout the week.

Read more about physical activity:

- [Physical Activity and Your Heart](#)
- U.S. Department of Health and Human Services' [2008 Physical Activity Guidelines for Americans](#)

Maintaining a Healthy Weight

Maintaining a healthy weight can help you control high blood pressure and reduce your risk for other health problems. If you're overweight or obese, try to lose weight. A loss of just 3 to 5 percent can lower your risk for health problems. Greater amounts of weight loss can improve blood pressure readings, lower [LDL cholesterol](#), and increase [HDL cholesterol](#). However, research shows that no matter your weight, it is important to control high blood pressure to maintain good health.

A useful measure of overweight and obesity is body mass index (BMI). BMI measures your weight in relation to your height. To figure out your BMI, check out NHLBI's online [BMI calculator](#) or talk to your health care provider.

A BMI:

- Below 18.5 is a sign that you are underweight.
- Between 18.5 and 24.9 is in the healthy range.
- Between 25 and 29.9 is considered overweight.
- Of 30 or more is considered obese.

A general goal to aim for is a BMI below 25. Your health care provider can help you set an appropriate BMI goal.

HealthPartners Care Coordination
Clinical Care Planning and Resource Guide
HYPERTENSION

Measuring waist circumference helps screen for possible health risks. If most of your fat is around your waist rather than at your hips, you're at a higher risk for heart disease and type 2 diabetes. This risk may be high with a waist size that is greater than 35 inches for women or greater than 40 inches for men. To learn how to measure your waist, visit [Assessing Your Weight and Health Risk](#). For more information about losing weight or maintaining your weight, go to [Aim for a Healthy Weight](#).

Limiting Alcohol Intake

Limit alcohol intake. Too much alcohol will raise your blood pressure and triglyceride levels, a type of fat found in the blood. Alcohol also adds extra calories, which may cause weight gain.

Men should have no more than two drinks containing alcohol a day. Women should have no more than one drink containing alcohol a day. One drink is:

- 12 ounces of beer
- 5 ounces of wine
- 1½ ounces of liquor

Managing and Coping With Stress

Learning how to manage stress, relax, and cope with problems can improve your emotional and physical health and can lower high blood pressure. Stress management techniques include:

- Being physically active
- Listening to music or focusing on something calm or peaceful
- Performing yoga or tai chi
- Meditating

Medicines

Blood pressure medicines work in different ways to stop or slow some of the body's functions that cause high blood pressure. Medicines to lower blood pressure include:

HealthPartners Care Coordination
Clinical Care Planning and Resource Guide
HYPERTENSION

- **Diuretics (Water or Fluid Pills):** Flush excess sodium from your body, which reduces the amount of fluid in your blood and helps to lower your blood pressure. Diuretics are often used with other high blood pressure medicines, sometimes in one combined pill.
- **Beta Blockers:** Help your heart beat slower and with less force. As a result, your heart pumps less blood through your blood vessels, which can help to lower your blood pressure.
- **Angiotensin-Converting Enzyme (ACE) Inhibitors:** Angiotensin-II is a hormone that narrows blood vessels, increasing blood pressure. ACE converts Angiotensin I to Angiotensin II. ACE inhibitors block this process, which stops the production of Angiotensin II, lowering blood pressure.
- **Angiotensin II Receptor Blockers (ARBs):** Block angiotensin II hormone from binding with receptors in the blood vessels. When angiotensin II is blocked, the blood vessels do not constrict or narrow, which can lower your blood pressure.
- **Calcium Channel Blockers:** Keep calcium from entering the muscle cells of your heart and blood vessels. This allows blood vessels to relax, which can lower your blood pressure.
- **Alpha Blockers:** Reduce nerve impulses that tighten blood vessels. This allows blood to flow more freely, causing blood pressure to go down.
- **Alpha-Beta Blockers:** Reduce nerve impulses the same way alpha blockers do. However, like beta blockers, they also slow the heartbeat. As a result, blood pressure goes down.
- **Central Acting Agents:** Act in the brain to decrease nerve signals that narrow blood vessels, which can lower blood pressure.
- **Vasodilators:** Relax the muscles in blood vessel walls, which can lower blood pressure.

To lower and control blood pressure, many people take two or more medicines. If you have side effects from your medicines, don't stop taking your medicines. Instead, talk with your health care provider about the side effects to see if the dose can be changed or a new medicine prescribed.

Future Treatments

Scientists, doctors, and researchers continue to study the changes that cause high blood pressure, to develop new medicines and treatments to control high blood pressure. Possible future treatments under investigation include new combination medicines, vaccines, and interventions aimed at the [sympathetic nervous system](#), such as kidney nerve [ablation](#).

Definition of Well-managed Hypertension

If you have high blood pressure, the best thing to do is to talk with your health care provider and take steps to control your blood pressure by making healthy lifestyle changes and taking medications, if any have been prescribed for you.

HealthPartners Care Coordination Clinical Care Planning and Resource Guide **HYPERTENSION**

For a healthy future, follow your treatment plan closely and work with your health care team.

Healthy Lifestyle Changes

You can help control your blood pressure by making these [healthy lifestyle](#) changes:

- Follow a healthy diet.
- Be physically active.
- Maintain a healthy weight.
- Limit alcohol intake.

Other lifestyle changes can improve your overall health, such as:

- If you [smoke](#), quit.
- Get plenty of sleep.
- Drink more water.

Medicines

Take all blood pressure [medicines](#) that your health care provider prescribes. Know the names and doses of your medicines and how to take them. If you have questions about your medicines, talk with your health care provider or pharmacist. Make sure you refill your medicines before they run out. Take your medicines exactly as your health care provider directs, and never skip days or cut pills in half.

Ongoing Care

Keeping track of your blood pressure is important. Check your blood pressure and have regular medical checkups or tests as your health care provider advises. You may want to learn how to check your blood pressure at home. Your health care provider can help you learn how to do this. Each time you check your own blood pressure, you should write down your numbers and the date. Take the log of your blood pressure readings with you to appointments with your health care provider.

During checkups, talk to your health care provider about:

- Blood pressure readings
- Your overall health
- Your treatment plan

HealthPartners Care Coordination
Clinical Care Planning and Resource Guide
HYPERTENSION

Your health care provider may need to change or add medicines to your treatment plan over time.

RESOURCES:

[NIH - Resources for High Blood Pressure](#)

[Mayo Clinic High Blood Pressure](#)

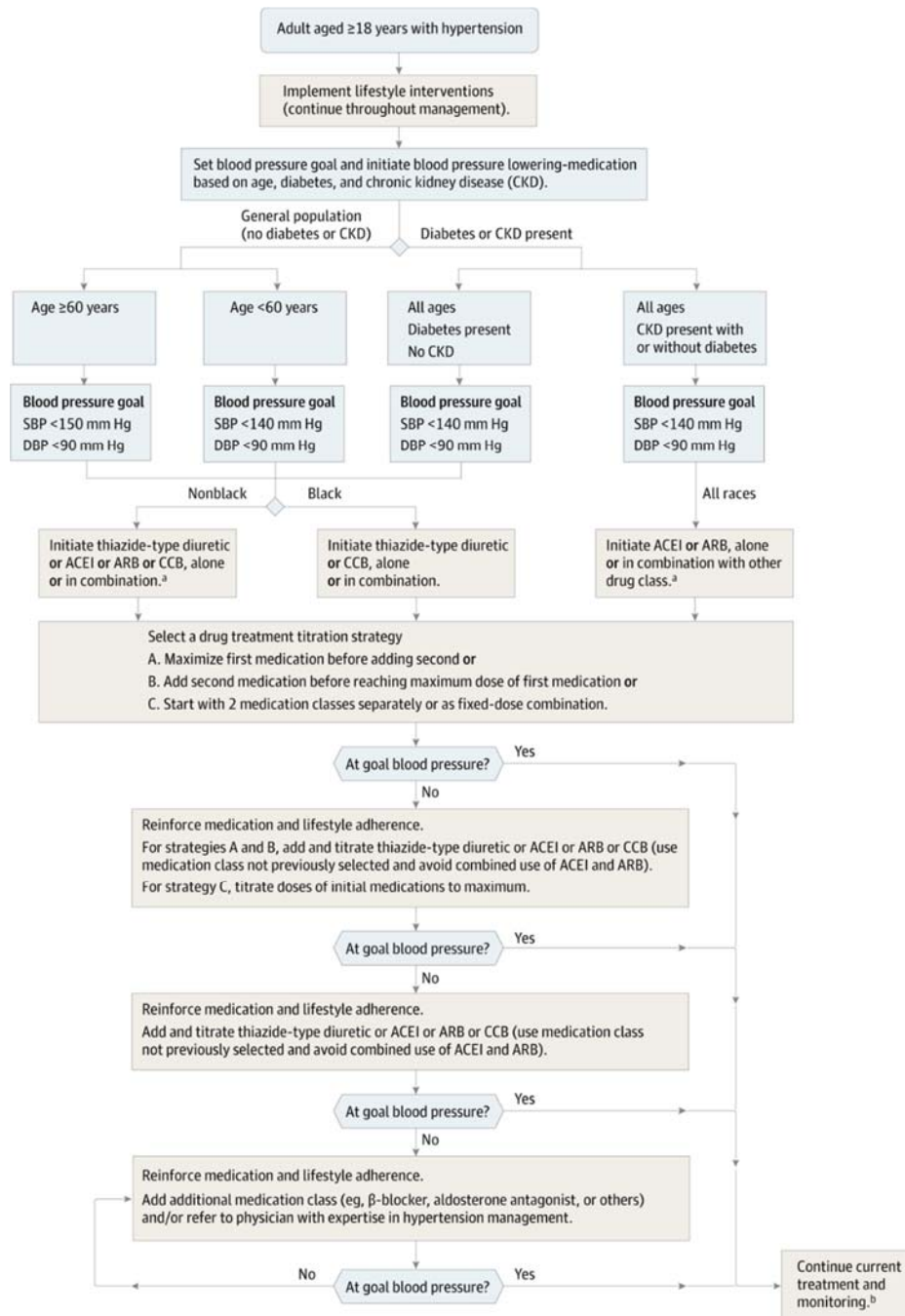
[American Heart Association High Blood Pressure Guide](#)

[Controlling Hypertension in Adults](#) (American Heart Association)

[JAMA 2014 Evidence-Based Guideline for BP Management](#)

[DASH Diet NIH site](#)

HealthPartners Care Coordination Clinical Care Planning and Resource Guide HYPERTENSION



HealthPartners Care Coordination
Clinical Care Planning and Resource Guide
HYPERTENSION

Chronic Care Guideline Goal from MCG	“As evidenced by” (AEB) example	Suggested care plan education from Coach & Communicate
Goal: better understanding of Hypertension diagnosis	As evidenced by patient self-reporting understanding of hypertension diagnosis.	Learn about high blood pressure
	As evidenced by patient self-reporting understanding of concerning symptoms.	
	As evidenced by patient self-reporting comprehension of health education received.	
	As evidenced by patient self-reporting adherence to prescribed plan of care.	
Goal: establish a Medical Home for ongoing patient care	As evidenced by patient/parent successfully following up with cardiologist.	
	As evidenced by patient/parent successfully following up with primary MD.	
Goal: develop, implement, and maintain a Hypertension self-management plan	As evidenced by patient self-reporting follow up with primary care provider for creation or evaluation of self-management plan.	Your Care Plan - Hypertension
	As evidenced by patient self-reporting adherence to medication regimen and lifestyle changes as necessary for reducing risk of complications. (specify)	High Blood Pressure: Should I take medicine? (SDM) High Blood Pressure: Taking Medicines Properly
	As evidenced by patient self-reporting dietary changes specific to patient needs, such as heart healthy, weight loss, low sodium, or diabetic diet. (specify)	Heart-Healthy Eating Healthy Eating: The DASH Diet
	As evidenced by patient self-reporting how to check blood pressure at home, desired target, and what changes should generate a call or visit to the physician.	Home Blood Pressure Test
Goal: better understanding of potential Hypertension-related complications and comorbidities	As evidenced by self-report of signs and symptoms of concern and related follow up recommendations.	
	As evidenced by self-report of when to call provider and when to seek emergency help.	Blood Pressure Numbers: When to get help