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# Hypertension across the lifespan: Older adults

Effective diagnosis and management in the older adult population can increase functional capacity and decrease morbidity and mortality.

By Tara C. Hilliard, PhD, APRN, ACNP-BC; Kellie Bruce, PhD, APRN, FNP-BC; Karen A. Esquibel, PhD, APRN, CPNP-PC; Inola Mello, DNP, APRN, FNP-C; and Amy Moore, DNP, APRN, FNP-C

*Editor's Note: In previous issues, we've looked at pediatric and adult hypertension. Join us this issue for the last of our three-part series as we explore hypertension in older adult patients.*

The older adult population has expanded exponentially over the past quarter century in the US. The number of individuals older than age 80 has more than doubled in the past decade. The lifetime risk of being diagnosed with hypertension (HTN) is greater than 90% in those older than age 55. This lifetime risk, combined with the rising number of older adults, has led to an increased prevalence of HTN within this population. Comorbidities can make treating HTN more complex in older adults, with the need to consider treatment in coordination with other disease processes. Untreated HTN in the older adult patient can lead to cognitive decline and increased morbidity and mortality from cardiovascular and renal events.

## Case studies

A 73-year-old female patient with a body mass index (BMI) of 19 has been treated for stage 1 HTN with chlorthalidone

25 mg once daily for the last 10 years.

Her atherosclerotic cardiovascular disease (ACVD) risk is less than 10% and her complete blood cell (CBC) count, electrolytes, thyroid-stimulating hormone (TSH), urinalysis, and ECG have been within normal limits since her diagnosis.

She occasionally drinks one glass of red wine, has never smoked, and has done routine strength training for 30 minutes a day, three times a week, for the past 5 years. She lives alone in a split-level home and uses the stairs multiple times each day. Even before her diagnosis, she was dedicated to eating healthy. Her diet consists of fruits, vegetables, regular protein in the form of baked chicken and fish, dairy products, and whole grains; she rarely eats out. She takes supplemental calcium, vitamin D, and magnesium.

The patient's BP remains at the goal of less than 130/80 mm Hg. She monitors her BP at home periodically, and those readings indicate that there's no masked uncontrolled HTN. She's scheduled for her annual follow-up appointment and advised to continue home BP monitoring.

A 58-year-old Black male patient was diagnosed with stage 2 HTN after having



four separate BP readings greater than 140/90 mm Hg during the past year. The BP readings were obtained accurately using a calibrated automatic monitor with an appropriate size cuff. The patient sat upright in the chair with both feet flat on the floor and his arm supported. The nurse verified that he hadn't smoked, consumed caffeine, or exercised at least 30 minutes before checking his BP. The patient refused to start antihypertensive medication but did agree to ambulatory monitoring and a follow-up appointment in 1 month.

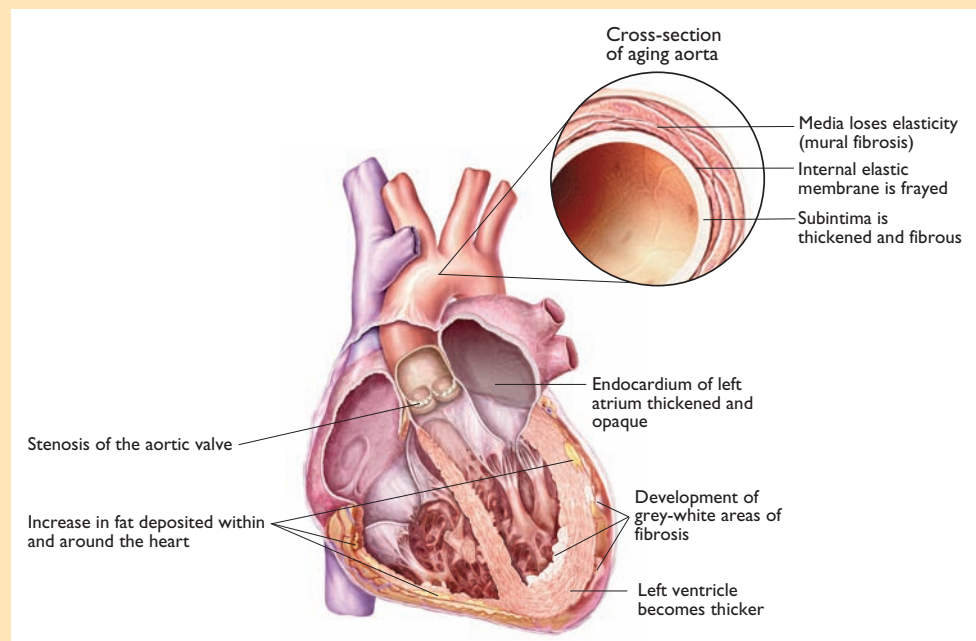
The patient has a previous history of smoking and a BMI of 32. His lab results, including fasting blood glucose, CBC count, lipid panel, serum creatine with estimated glomerular filtration rate, basic metabolic panel, TSH, urinalysis, uric acid, ECG, and an echocardiogram, are all within normal limits except for elevated total cholesterol and low-density

lipoprotein cholesterol. His ACVD risk is calculated at 10.4%. As a Black male, the patient's goal BP is less than 130/80 mm Hg regardless of a diagnosis of diabetes, heart failure, or chronic kidney disease (CKD).

Environmental factors are evaluated, including access to DASH diet food sources, routine activity, and alcohol limitations. The DASH diet includes foods low in sodium and high in fiber, potassium-rich fruits and vegetables, lean proteins, fish, and dairy. Calcium supplements are recommended and weight loss with the addition of regular exercise is also encouraged.

At his follow-up appointment, the patient's ambulatory and office BP readings average 156/100 mm Hg. The concern for cardiovascular events and CKD due to the risk of more severe HTN in Black adults is stressed with the patient and he agrees to start medication.

## The aging heart



Source: Anatomical Chart Company

Hydrochlorothiazide 25 mg and amlodipine 5 mg daily is initiated. A low-sodium diet is stressed based on genetic salt sensitivity. The patient is scheduled to return for follow-up in 1 month to reassess his BP after initiation of antihypertensive therapy.

### Significant epidemiology

Individuals with CVD are living longer today than in previous eras. Due to multiple comorbidities, the needs of older patients with CVD are more complex. Age itself is a risk factor that predisposes older adults to CVD. In 1900, the number of people age 65 and older in the US was approximately 3 million. With successful advances in medical care, the numbers now exceed 46 million, with a substantial increase in those who are age 85 and older.

Older adults are likely to develop some type of CVD due to physiologic and pathologic changes as they age, even with no previous history of CVD, and these changes can also lead to HTN (see *The aging heart*). The heart becomes thicker and stiffer with age, including an increase in myocardial thickness with left ventricular hypertrophy and enlargement of the left atrium. As the intimal-medial thickness of the vascular wall increases, elastic fibers fray and the ability for the arterial wall to expand and contract is reduced. Stiffening of the arteries results in a rise in systolic pressure. The diastolic pressure rises until approximately age 60 and then begins to drop due to a lack of recoil from the larger arteries.

HTN occurs in more than 70% of adults age 65 and older. Research has substantiated that treatment for HTN in people age 60 and older prevents myocardial infarctions and decreases the risk of death due to cardiovascular events. The 2008 Hypertension in the Very Elderly Trial proposed that a BP of 150/80 mm Hg or lower was beneficial for those older than age 75. Conversely, the 2015 SPRINT

### Older adult BP categories

- **Normal BP:** systolic <120/80 mm Hg
- **Elevated BP:** systolic 120 to 129/80 mm Hg
- **Stage 1 HTN:** systolic 130 to 139 mm Hg or diastolic 80 to 89 mm Hg
- **Stage 2 HTN:** systolic  $\geq$ 140 mm Hg or diastolic  $\geq$ 90 mm Hg

cheat

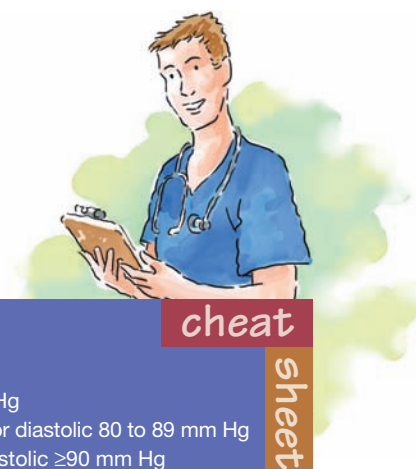
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Trial (updated in 2018) found that a lower systolic BP with a target of 120 mm Hg in older adults is more effective in preventing cardiovascular events. In addition, the SPRINT Trial found a decrease in the incidence of dementia and fewer complications in those with CKD. Guidelines published in 2017 by the American College of Physicians and the American Academy of Family Physicians recommend pharmacologic treatment for patients age 60 and older who have a systolic BP of 150 mm Hg or greater. They further stratified older patients as “elderly” and “very old,” with less stringent targets as the patient ages.

How aggressively a patient with elevated BP is treated must be individualized. Close BP monitoring in older patients must be thorough due to fall risk and the potential for deterioration in renal function. Masked diastolic hypotension can be a problematic and not uncommon occurrence in older patients who are being treated for HTN. When deciding about BP targets, the benefits must outweigh the risks. Target pressures may change as the patient ages, with consideration for quality of life.

### Guidelines for diagnosis

The American College of Cardiology (ACC) and the American Heart Association (AHA) continue to sponsor the development of guidelines for the prevention, detection, evaluation, and management of high BP in older adults, defined as those age 65 and older. The ACC/AHA guidelines are intended to support patients at risk for developing CVD. It's important to identify common CVD risk factors in patients with HTN.



Adults age 65 and older have the highest prevalence of HTN and the greatest risk of morbidity and mortality due to CVD. They also tend to be underdiagnosed and undertreated for HTN.

The guidelines indicate a target BP of less than 130/80 mm Hg. The designated BP threshold for the initiation of pharmacotherapy is greater than or equal to

### Guidelines for treatment

Treatment of HTN in older adults is multifaceted. There are several distinctive elements that must be considered when creating a treatment plan for an older patient with HTN. Polypharmacy presents a significant treatment dilemma in many older patients. Drug-drug interactions may result in negative adverse



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130/80 mm Hg as a more aggressive limit to prevent CVD. Once diagnosed with HTN, BP readings are categorized as stage 1 or stage 2. Systolic and diastolic BP are based on the average of two or more readings obtained on two or more separate occasions.

The BP categories for older adults are:

- normal BP: systolic <120/80 mm Hg
- elevated BP: systolic 120 to 129/80 mm Hg
- stage 1 HTN: systolic 130 to 139 mm Hg or diastolic 80 to 89 mm Hg
- stage 2 HTN: systolic  $\geq$ 140 mm Hg or diastolic  $\geq$ 90 mm Hg.

It's critical that accurate measurement and recording of BP take place to minimize errors in diagnosis and treatment. The patient should sit quietly for 5 minutes before taking the BP reading. Support the limb used to measure BP, ensure the cuff is at the level of the heart, select the correct cuff size, and deflate it slowly while auscultating. The ACC/AHA guidelines also advise the use of clinical judgment to determine BP targets in older patients with limited life expectancy and multiple comorbidities.

reactions, such as hypotension and bradycardia. Also compounding the treatment dilemma is the fact that many randomized controlled clinical trials include few older subjects; less outcome data may be available for the older adult population.

Once a diagnosis of HTN is established, the treatment plan should be individualized based on patient comorbidities, functional ability, cognitive state, and family/caregiver support. The BP goals for older adults are well established. Treatment guidelines are specifically designed to correlate with each category. Prevailing thought indicates that a lower systolic BP in older patients is associated with improved long-term outcomes.

Before initiating pharmacotherapy for an older patient, lifestyle modifications should be attempted, including the adoption of a low-sodium (1,000 mg/day or less), low-carbohydrate, balanced diet; weight loss when appropriate; and routine aerobic exercise (90 to 150 minutes/week). Patients should also be educated about tobacco cessation, when



appropriate, and limited alcohol intake. Medication reconciliation should be completed at each visit with an eye toward detecting drugs that may increase BP, such as nonsteroidal anti-inflammatory drugs (NSAIDs) and over-the-counter (OTC) cold medications (see *A closer look at OTC medications*). Stress reduction techniques, such as meditation and biofeedback, should be addressed with each patient. When appropriate, patients should be screened for secondary causes of HTN, which include excessive use of alcohol, NSAID use, illicit drug use, obstructive sleep apnea, and CKD.

If nonpharmacologic interventions are unsuccessful, pharmacotherapy should be initiated. Before initiation of any antihypertensive medication, the patient's baseline renal function and electrolyte values should be evaluated. If there are abnormalities, the condition should be further evaluated. Patients should also be evaluated for their ability to participate in the treatment plan, including understanding medication instructions, home management techniques such as BP and pulse recordings, and medication adverse reactions. The patient's family and/or caregiver should always be actively involved in drafting the treatment plan. After pharmacotherapy is initiated, the patient should be seen back in the office within a few weeks for follow-up.

Angiotensin-converting enzyme (ACE) inhibitors, angiotensin receptor blockers, thiazide diuretics, and calcium channel blockers are considered acceptable as first-line medications for older patients. Due to the risk of bradycardia, beta-blockers aren't recommended as initial single medication therapy. The risk of hypotension eliminates alpha-blockers as first-line treatment in older patients.

Because BP control in older adults is more complex, a multidrug approach is often required. Initial treatment should include one of the four drug classes mentioned above. A single medication should

### A closer look at OTC medications

OTC drugs and herbal supplements often affect BP but because patients often don't consider them to be medications, they may not self-report use. OTC oral, nasal, and ophthalmic decongestants, as well as NSAIDs, are well-known for increasing BP. There's conflicting online information on supplements available to patients. For example, ginger can be found listed as an herb that will both lower and raise BP. Potassium is listed as a nutritional supplement that will regulate BP; however, potassium supplementation can be dangerous for patients taking certain BP medications such as ACE inhibitors. Caffeine, bitter orange, licorice, St. John's wort, ginseng, arnica, guarana, blue cohosh, yohimbe, and chaste berry are known to raise BP. Ephedra and ma huang raise BP and are now illegal in the US; however, some supplements may contain ephedra-like compounds that aren't indicated on the packaging. Questions regarding OTC medications and herbal and other supplements must always be a component of nursing assessment for patients with HTN.

be trialed first. If the first drug, at its maximal dosage, is unsuccessful at bringing the BP into target range, a second drug from the preferred first-line options should be started. If necessary, a third medication can be used.

Dual medication therapy may be taken in a single pill; for example, lisinopril/hydrochlorothiazide (HCTZ). However, the dual medication pills should only be used once the patient has established tolerance for both the drugs contained in the pill. Beginning HTN therapy with a dual medication pill can make it difficult to determine the source of adverse drug reactions. For example, a patient is initially started on lisinopril/HCTZ for HTN. They experience a significant skin rash 3 days after starting the combination medication. Is it the lisinopril or the HCTZ causing the rash?

All patients should be taught how to properly check BP at home. They should

check their BP routinely and keep a log of the readings. The log should be brought to each office visit. If patients are physically or cognitively unable to check their own BP at home, the caregiver should

provider and referral for emergent situations; follow-up care must continue to ensure that BP readings are within range, especially if patients experience changes in diet and weight



The identification, diagnosis, and management of HTN in older adults must occur with recognition that older patients may have multiple comorbidities that make treatment more complex.

be taught proper techniques for BP measurement. Home health nurses can also play a vital role in the care of the older patient with HTN by providing teaching on proper medication administration and supervising patient BP measuring techniques.

Older adults capable of using current healthcare technology apps may benefit in several ways. There are apps that provide reminders for the patient to check their BP, as well as tracking/logging their BP. Other apps provide medication reminders.

### **Nursing implications**

Nurses play a key role in improving BP monitoring and patient outcomes, providing holistic care as a member of the interdisciplinary team. Key points for nurses include the following:

- select the appropriate size BP cuff to ensure accurate BP measurement; the cuff bladder should cover 80% of the length of the upper arm
- apply appropriate technique: have the patient sit comfortably with both feet on the floor, their legs uncrossed, their back supported, and their arms at heart level; deflate the cuff slowly
- ensure vigilant follow-up at regularly scheduled intervals with the healthcare

- educate patients about medication administration, including the best time to take the medication; the appropriate route; the correct dosage; and potential adverse reactions, such as hypotension, dizziness, and cough
- teach patients how to take BP at home and record the readings; patients should compare their BP cuffs with those used in the clinic regularly to ensure accuracy
- provide nutritional, exercise, and relaxation techniques to help lower BP.

### **Individualized care**

The identification, diagnosis, and management of HTN in older adults must occur with recognition that older patients may have multiple comorbidities that make treatment more complex. We must be cognizant that elevated BP in older patients should be monitored for progression toward a diagnosis of HTN. As the older adult ages, diagnostic and treatment guidelines for HTN allow for a higher systolic BP to reduce fall risk from possible hypotension if BP is treated too aggressively. It's important to consider the risk versus benefit when setting individualized BP goals within the context of the older patient's concurrent diagnoses and mental and functional capacity. Optimal treatment of HTN will result in



decreased morbidity and mortality and promote a higher quality of life for older adults. ■

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At Texas Tech University Health Sciences Center School of Nursing in Lubbock, Tex., Tara C. Hilliard is an Associate Professor and Director of Adult Gerontology Acute Care NP Studies, Kellie Bruce is an Associate Professor and Director of Family NP Studies, Karen A. Esquibel is an Associate Professor and Director of Pediatric NP Studies, Inola Mello is an Associate Professor of Nursing, and Amy Moore is an Associate Professor of Nursing.

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