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Arizona Center on Aging
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April 2016

ELDER CARE

A Resource for Interprofessional Providers

Managing Hypertension in Older Adults

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Hypertension is a major health concern for older adults. It is associated with an increased rate of cardiovascular disorders including myocardial infarction, heart failure and strokes, along with chronic kidney disease. Blood pressure (BP) rises throughout life due to age-associated increases in arterial stiffness. By the time adults reach their 60s, most of them have hypertension.

BP should be measured in both arms, using the higher of the two readings to categorize hypertension. Prehypertension is defined as systolic blood pressure (SBP) between 120-139 mmHg and diastolic blood pressure (DBP) between 80-89 mm Hg. In stage-1 hypertension, SBP is between 140-159 mm Hg, and DBP 90-99 mm Hg, while in stage-2, SBP is ≥160 mm Hg and DBP ≥100 mm Hg.

Standing BPs should also be measured in older adults to check for postural effects. 24-hour ambulatory BP monitoring can assess for BP variability, which is more pronounced in older adults and a strong predictor of developing cardiovascular, cerebral and renal disease.

Treatment should begin with non-pharmacologic measures including smoking cessation, weight loss, moderate aerobic exercise, and dietary modifications including reduction of salt intake and alcohol consumption.

Pharmacologic therapy should be started immediately in patients with stage-2 hypertension, and considered earlier for those with stage-1 hypertension who have other cardiovascular risk factors.

Treatment Goals for Older Adults

The Eighth Joint National Committee (JNC8) BP guidelines, published in 2014, recommended treatment goals for those aged 60 years and older of a SBP <150 mmHg and a DBP <90 mmHg. If a patient is already on therapy that achieves a SBP <140 mmHg without adverse effects, however, the guidelines say there is no need to adjust therapy to allow BP to increase.

The higher BP goal for those over age 60 has become controversial and criticized by various entities, including organizations representing African-Americans and women. The JNC8 guidelines also contrasted with guidelines from the American Society of Hypertension and the International Society of Hypertension which recommend a SBP goal <140 mmHg for those aged 55-80, and a more lenient goal of <150 mmHg only for those older than 80.

SPRINT Trial

The SPRINT trial, published after JNC 8, showed that a SBP <120 mmHg resulted in lower rates of major cardiovascular events and death compared to a SBP <140 mmHg. Results are not generalizable to all patients as study participants had an increased cardiovascular risk, defined as having cardiovascular disease, chronic kidney disease, a 10-year risk of cardiovascular events >15% using the Framingham score, or being age 75 or older (1/3 of participants were at least 75). Moreover, those with history of stroke or diabetes were excluded. There was a higher rate of hypotension, syncope, electrolyte disorders and kidney injury in the intensive control group.

Which Drug Regimens are Suitable for Older Adults?

JNC8 recommends thiazide diuretics and calcium channel-blockers (CCBs) as first-line agents for everyone. Angiotensin-converting enzyme inhibitors (ACEIs) and angiotensin-receptor blockers (ARBs) are also considered first-line agents except for African-Americans. Recommendations for patients with other medical conditions are summarized in the table and comments about individual drugs follow.

Calcium Channel Blockers

Dihydropyridines (amlodipine and nifedipime) should be used preferentially over first generation CCBs (verapamil

Initial Drug Selection for Patients with Other Medical Conditions

Condition	*Initial Drug Selection*
Clinical coronary artery disease	BB + ACEI/ARB
Chronic kidney disease	ACEI/ARB
Diabetes, African-Americans	CCB or thiazide diuretic ACEI/ARB if proteinuria present
Diabetes, non-African Americans	ACEI or ARB
History of stroke	ACEI/ARB
Systolic heart failure	BB + ACEI/ARB; spironolactone if persistent low EF

ACEI=angiotensin converting enzyme inhibitor, ARB=angiotensin receptor blocker, CCB=calcium channel blocker, BB=beta blocker, EF=ejection fraction

TIPS for TREATING HYPERTENSION IN OLDER ADULTS

- Controversy exists regarding blood pressure goals for older adults. The JNC-8 recommends systolic/diastolic goals of <150/90 mmHg, but some studies and other guidelines suggest better outcomes with lower blood pressures.
- Thiazide diuretics and calcium channel blockers as first-line therapy. ACE Inhibitors are also first-line drugs except for African-Americana
- CCBs and ARBs have the highest adherence rates given their favorable side effect profile.

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or diltiazem) and are generally well tolerated. Common adverse effects are related to vasodilation, and include ankle edema, headaches, and postural hypotension. First generation CCBs should only be used to manage supraventricular arrhythmias such as atrial fibrillation as they can otherwise cause conduction abnormalities. They should also be avoided in patients with heart failure.

ACE-Inhibitors and Angiotensin Receptor Blockers

ACEIs are the preferred first-line agents in all patients with left ventricular systolic dysfunction, recent myocardial infarction, or chronic kidney disease. In African-Americans without these conditions, ACEIs should not be used as initial therapy given their lower efficacy of BP control and the higher rates of stroke seen in African-Americans on ACEIs compared to CCBs. Even in diabetics, ACEIs should be avoided as first-line agents in African-Americans unless proteinuric nephropathy is present.

Monitoring electrolytes is prudent in older adults on ACEIs/ARBs, and avoidance of NSAIDs should be encouraged to diminish risks of renal impairment. The main side effects of ACEIs are dry cough and rarely, angioedema. ARBs can be used as alternatives in heart failure patients intolerant to ACE-induced cough, but ARBs can still cause angioedema. ACEIs and ARBs should not be used together.

Thiazides

While thiazides are considered first-line agents, they should be used cautiously in older adults who are more prone to hypovolemia and orthostatic hypotension. When used, hydrochlorothiazide is preferred given that chlorthalidone has a longer duration of action and a higher incidence of electrolyte abnormalities in older adults. Thiazides also can precipitate gout and worsen insulin resistance and dyslipidemia. NSAIDs reduce the effectiveness of thiazides.

Beta-Blockers

Beta-Blockers (BBs) are used to treat left ventricular systolic dysfunction, chronic stable angina, myocardial infarction, and some tachyarrythmias. Aside from treating these conditions, BBs are no longer considered first-line therapy for hypertension because they can cause bradycardia, do not reduce central aortic pressure, and their use in uncomplicated hypertension results in higher all-cause and cardiovascular mortality, particularly strokes. Many older adults are still taking BBs as first-line BP therapy because of prior Joint National Committee guidelines (JNC7). They should have their therapy modified even if their SBP is at goal. When BBs are used, such as in patients with heart failure, third-generation BBs, like carvedilol, are often preferred because they are slightly less likely than other BBs to cause drowsiness, lethargy and depression, although these effects may still occur.

Other Medications

Other medications are sometimes used to treat hypertension when patients have other indications for using them (see Table).

Table. Other Medications Sometimes Used in Treatment of Hypertension

Medication	*Indications*	*Common Side Effects*
Spironolactone	Ejection fraction (EF) persistently <35% after use of ACEI/ARB + BB; or EF <40% with recent myocardial infarction	Hyperkalemia, renal dysfunction, breast tenderness, sexual dysfunction
Hydralazine + nitrates	Persistent EF < 40% after use of initial heart failure therapy	Combine with diuretics and BBs to avoid fluid retention and reflex tachycardia
Clonidine		Sedation, bradycardia, rebound tachycardia and hypertension with abrupt withdrawal
Doxazosin, Terazosin	Benign prostatic hypertrophy	Postural hypotension, bradycardia; on Beers list of drugs to avoid in older adults

Adherence to Therapy

Only 20% of patients age 65 and older show adequate adherence to BP regimens, and 50% discontinue treatment within a year. A high percentage of hospital admissions are related to non-adherence. CCBs and ARBs have the highest adherence rates, while BBs and diuretics have the lowest due to side effects. Preferentially use medications that are taken once daily to improve adherence. Combination pills have been shown to increase adherence to 70%, but should be used only after patients have been shown to tolerate the individual components.

Therapy for Adults Over 80

HYVET was a randomized controlled trial that included only adults over 80 years of age. HYVET found a reduction in stroke, cardiovascular events, and total mortality when BP was treated to a goal of <150/<80 mmHg. A diuretic was first-line therapy; an ACEI added if treatment goal was not met.

Therapy for Frail Older Adults

A subsequent analysis of HYVET results investigated the effect of frailty on outcomes. The Frailty Index (FI) was calculated for participants and there was no difference in the rate of stroke or other cardiovascular events in patients with or without a high frailty index. The study concluded that frailty alone should not justify a more lenient BP goal.

References and Resources

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Supported by: Donald W. Reynolds Foundation, Arizona Geriatric Education Center and Arizona Center on Aging

This project was supported by the Health Resources and Services Administration (HRSA) of the U.S. Department of Health and Human Services (HHS) under grant number U1QHP28721, Arizona Geriatrics Workforce Enhancement Program. This information or content and conclusions are those of the author and should not be construed as the official position or policy of, nor should any endorsements be inferred by HRSA, HHS or the U.S. Government.