Capital Health PLAN℠

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Management of High Blood Pressure in Adults

Based on the Report from the Panel Members Appointed to the Eighth Joint National Committee (JNC8)

James, P. A. (2014, February 05). 2014 Guideline for Management of High Blood Pressure. Retrieved April 30, 2018, from https://jamanetwork.com/journals/jama/fullarticle/1791497

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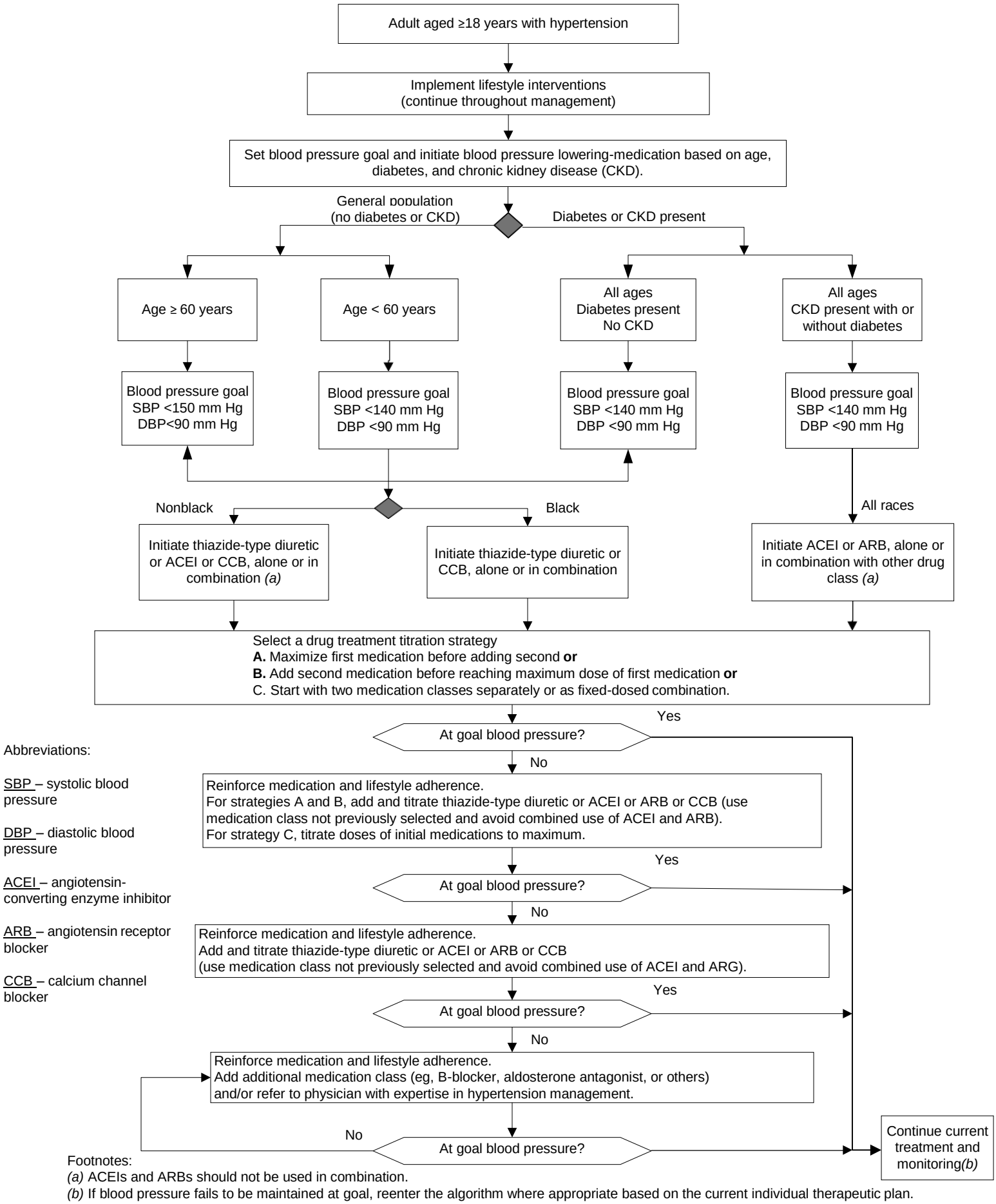
2014 Hypertension Guideline Management Algorithm



Abbreviations:

SBP – systolic blood pressure

DBP – diastolic blood pressure

ACEI – angiotensin-converting enzyme inhibitor

ARB – angiotensin receptor blocker

CCB – calcium channel blocker

Footnotes:

(a) ACEIs and ARBs should not be used in combination.

(b) If blood pressure fails to be maintained at goal, reenter the algorithm where appropriate based on the current individual therapeutic plan.

Important changes from the JNC 7 guidelines include the following:

- In patients 60 years or older who do not have diabetes or chronic kidney disease, the goal blood pressure level is now <150/90 mm Hg.

- In patients 18 to 59 years of age without major comorbidities, and in patients 60 years or older who have diabetes, chronic kidney disease (CKD), or both conditions, the new goal blood pressure level is <140/90 mm Hg.

- First-line and later-line treatments should now be limited to 4 classes of medications: thiazide-type diuretics, calcium channel blockers (CCBs), ACE inhibitors, and ARBs.

- Second- and third-line alternatives included higher doses or combinations of ACE inhibitors, ARBs, thiazide-type diuretics, and CCBs. Several medications are now designated as later-line alternatives, including the following: beta-blockers, alphablockers, alpha1/beta-blockers (eg, carvedilo), vasodilating beta-blockers (eg, nebivolol), central alpha2/-adrenergic agonists (eg, clonidine), direct vasodilators (eg, hydralazine), loop diruretics (eg, furosemide), aldosterone antagoinsts (eg, spironolactone), and peripherally acting adrenergic antagonists (eg, reserpine).

- When initiating therapy, patients of African descent without CKD should use CCBs and thiazides instead of ACE inhibitors.

- Use of ACE inhibitors and ARBs is recommended in all patients with CKD regardless of ethnic background, either as first-line therapy or in addition to first-line therapy.

- ACE inhibitors and ARBs should not be used in the same patient simultaneously.

- CCBs and thiazide-type diuretics should be used instead of ACE inhibitors and ARBs in patients over the age of 75 years with impaired kidney function due to the risk of hyperkalemia, increased creatinine, and further renal impairment.

The change to a more lenient systolic blood pressure goal may be confusing to many patients who are accustomed to the lower goals of JNC 7, including the <140/90 mm Hg goal for most patients and <130/80 mm Hg goal for patients with hypertension and major comorbidities.

The guidelines were informed by results of 5 key trials: the Hypertension Detection and Follow- up Program (HDFP), the Hypertension-Stroke Cooperative, the Medical Research Council (MRC) trial, the Australian National Blood Pressure (ANBP) trial, and the Veterans' Administration (VA) Cooperative. In these trials, patients between the ages of 30 and 69 years received medication to lower DBP to a level <90 mm Hg. Results showed a reduction in cerebrovascular events, heart failure, and overall mortality in patients treated to the DBP target level.

The data were so compelling that some members of the JNC 8 panel wanted to keep DBP <90 mm Hg as the only goal among younger patients, citing insufficient evidence for benefits of an SBP goal lower than 140 mm Hg in patients under the age of 60 years. However, more conservative panelists pushed to keep the target SBP goal as well as the DBP goal.

In younger patients without major comorbidities, elevated DBP is a more important cardiovascular risk factor than is elevated SBP. The JNC 8 panelists are not the first guideline authors to recognize this relationship. The JNC 7 guideline authors also acknowledged that DBP control was more important than SBP control for reducing cardiovascular risk in patients <60 years of age. However, in patients 60 years and older SBP control remains the most important factor.

Other recent evidence suggests that the SBP goal <140 mm Hg recommended by the JNC 7 guidelines for most patients may have been unnecessarily low. The JNC 8 guideline authors cite 2 trials that found no improvement in cardiovascular outcomes with an SBP target <140 mm Hg compared with a target SBP level <160 mm Hg or <150 mm Hg. Despite this finding, the new guidelines do not disallow treatment to a target SBP <140 mm Hg, but recommend caution to ensure that low SBP levels do not affect quality of life or lead to adverse events.

The shift to a DBP-based goal may mean younger patients will be prescribed fewer medications if diagnosed with hypertension; this may improve adherence and minimize adverse events associated with low SBP, such as sexual dysfunction.

Patients With Kidney Disease

Although 1 post hoc analysis showed a possible advantage in kidney outcomes with the lower target of 130/80 mm Hg recommended by JNC 7, 2 other primary analyses did not support this finding. Additionally, another 3 trials did not show an advantage with the <130/80 mm Hg goal over the <140/90 mm Hg goal level for patients with chronic kidney disease.

As a result, the new guidelines recommend that patients with chronic kidney disease receive medication sufficient to achieve the higher <140/90 mm Hg goal level. However, in an exception to this goal level, the guidelines suggest that patients with chronic kidney disease or albuminuria 70 years or older should receive treatment based on comorbidities, frailty, and other patient-specific factors.

Evidence was insufficient to support a goal blood pressure of <140/90 mm Hg in patients over the age of 70 years with CKD or albuminuria.

Patients With Diabetes

Adults with diabetes and hypertension have reduced mortality as well as improved cardiovascular and cerebrovascular outcomes with treatment to a goal SBP <150 mm Hg, but no randomized controlled trials support a goal <140/90 mm Hg. Despite this, the panel opted for a conservative recommendation in patients with diabetes and hypertension, opting for a goal level of <140/90 mm Hg in adult patients with diabetes and hypertension rather than the evidence based goal of <150/90 mm Hg.

Follow-up

The JNC 8 guideline simplified a complicated recommendation for follow-up in patients with hypertension. The JNC 7 panel recommended that after an initial high blood pressure reading, follow-up with a confirmatory blood pressure reading should occur within 7 days to 2 months, depending on how high the initial reading was and whether or not the patient had kidney disease or end-organ damage as a result of hypertension. Under JNC 8, in all cases, goal blood pressure targets should be reached within a month of starting treatment either by increasing the dose of an initial drug or by using a combination of medications.

Treatments

Like the JNC 7 panel, the JNC 8 panel recommended thiazide-type diuretics as initial therapy for most patients. Although ACE inhibitors, ARBs, and calcium channel blockers (CCBs) are acceptable alternatives, thiazide-type diuretics still have the best evidence of efficacy.

The JNC 8 panel does not recommend first-line therapy with beta-blockers and alpha-blockers due to 1 trial that showed a higher rate of cardiovascular events with use of beta-blockers compared with use of an ARB, and another trial in which alpha-blockers resulted in inferior cardiovascular outcomes compared with use of a diuretic. In addition, a lack of evidence comparing the 4 first-line therapies with carvedilol, nebivolol, clonidine, hydralazine, reserpine, furosemide, spironolactone, and other similar medications precludes use of any medications other than ACE inhibitors, ARBs, CCBs, and thiazide-type diuretics in the vast majority of patients.

Before receiving alpha-blockers, beta-blockers, or any of several miscellaneous agents, under the JNC 8 guidelines, patients would receive a dosage adjustment and combinations of the 4 first-line therapies. Triple therapy with an ACE inhibitor/ARB, CCB, and thiazide-type diuretic would precede use of alpha-blockers, beta-blockers, or any of several other agents.

These new guidelines all but eliminate use of beta-blockers (including nebivolol), alpha-blockers, loop diuretics, alpha 1/beta-blockers, central alpha2/adrenergic agonists, direct vasodilators, aldosterone antagonists, and peripherally acting adrenergic antagonists in patients with newly diagnosed hypertension. Caution is warranted in patients who are already stable on these therapies.

Special Therapeutic Considerations

ACE inhibitors and ARBs may not be an ideal choice in patients of African descent. Results of a subgroup analysis in the Antihypertensive and Lipid Lowering Treatment to Prevent Heart Attack Trial (ALLHAT) found that ACE inhibitors led to worse cardiovascular outcomes than thiazide-type diuretics or CCBs in patients with African ancestry. Despite the subgroup analysis of ALLHAT, results of the African American Study of Kidney Disease and Hypertension (AASK) support use of first-line or add-on ACEIs to improve kidney-related outcomes in patients of African descent with hypertension, CKD, and proteinuria.

As a result, the JNC 8 panelists recommend that all patients with chronic kidney disease and hypertension, regardless of ethnic background, should receive treatment with an ACE inhibitor or ARB to protect kidney function, either as initial therapy or add-on therapy.

One exception to the use of ACE inhibitors or ARBs in protection of kidney function applies to patients over the age of 75 years. The panel cited the potential for ACE inhibitors and ARBs to increase serum creatinine and produce hyperkalemia. As a result, for patients over the age of 75 years with decreased renal function, thiazide-type diuretics or CCBs are an acceptable alternative to ACEIs or ARBs. In addition, the panel expressly prohibits simultaneous use of an ACE inhibitor and an ARB in the same patient. This combination has not been shown to improve outcomes. Despite the fact that the 2 medications work at different points in the renin- angiotensin-aldosterone system, other combinations of medications are better options, and the simultaneous use of ACEIs and ARBs is not supported by evidence.

Lifestyle Changes

As in JNC 7, the JNC 8 guidelines also recommend lifestyle changes as an important component of therapy. Lifestyle interventions include use of the Dietary Approaches to Stop Hypertension (DASH) eating plan, weight loss, reduction in sodium intake to less than 2.4 grams per day, and at least 30 minutes of aerobic activity most days of the week.

In addition, to delay development of hypertension, improve the blood pressure–lowering effect of existing medication, and decrease cardiovascular risk, alcohol intake should be limited to 2 drinks daily in men and 1 drink daily in women. Note that 1 drink constitutes 12 ounces of beer, 5 ounces of wine, or 1.5 ounces of 80-proof liquor. Quitting smoking also reduces cardiovascular risk.

Conclusion

The JNC 8 guidelines move away from the assumption that lower blood pressure levels will improve outcomes regardless of the type of agent used to achieve the lower level. Instead, the JNC 8 guidelines encourage use of agents with the best evidence of reducing cardiovascular risk. In addition, the guidelines may lead to less use of antihypertensive medications in younger patients, which will produce equivalent outcomes in terms of cardiovascular events with less potential for adverse events that limit adherence.

Treatment of Hypertension - CHP Quality Improvement Committee, 7/8/14

- The most common reason for poor control is patient noncompliance. Reasons for poor compliance:
    - Cost. Use generics whenever possible.
    - Complexity. Use combination drugs when possible.
    - Drug side effects
- Other factors causing poor BP control:
    - Alcohol abuse
    - Sleep apnea. All obese patients should be considered for oximetry.
    - Inappropriate drug treatment or inadequate doses.
    - Secondary causes such as renal artery stenosis
- Most hypertensive patients require more than one drug.
- Three first-line drug classes are:
    - ACE Inhibitors/ARBs
    - Diuretics
    - Calcium blockers
        - Calcium blockers are more effective than ACE Inhibitors for hypertension control in African Americans.
- Beta-blockers should not be used as first-line agents based on lack of cardiovascular morbidity and mortality benefit, lack of stroke benefit, numerous adverse side effects including weight gain, lack of regression of target end-organ effects such as LVH, and the impairment of glucose tolerance. When needed as a second or third drug, carvedilol is much preferred given its lesser metabolic effects.
- Alpha-blockers are not useful antihypertensive – see ASCOT Trial.
- Beta blocker/thiazide combinations are additive in terms of glucose intolerance and should be avoided.

Drug Therapy Tips

- ACE Inhibitor/HCTZ combinations are excellent, i.e. Zestoretic, Vasoretic. You get two of the first line drugs for one generic copay.
- Increase lisinopril/enalopril up to 40mg/day and HCTZ to 25mg before adding another drug. Avoid placebo doses of ACE Inhibitors such as lisinopril 2.5 or 5mg!
- Amlodipine is often very effective if another drug is needed. Use either 5 or 10mg doses.
- If poor control, check CHP*Connect* Medication Profile to make sure patient is filling prescriptions.
- If patient is taking meds but is still poorly controlled and doesn't have OSA or overuse ETOH, consider work-up of secondary causes such as renal artery stenosis or hyperaldosteronism.
- ACE Inhibitors are more cost-effective, but ARBs are a reasonable alternative if ACE Inhibitors cannot be tolerated.
- For patients with resistant hypertension, uncontrolled on 3 or more drugs, the addition of spironolactone in low doses (25mg once a day) has been shown to be effective, especially

in obese patients. When adding this drug to either ACE inhibitors pr ARBs, serial BMPs should be obtained over the first 6 weeks to make sure the patient is not developing hyperkalemia or renal insufficiency (consider weekly x2, then every 2 weeks x2.)

- When instituting therapy in high risk[1] patients with systolic HTN, the ACCOMPLISH trial supports a combination of calcium channel blockers and ACE Inhibitors such as Lotrel as more effective than an ACE Inhibitor and diuretic.
- Not all thiazide diuretics are equivalent. Both the ALLHAT and SHEP studies, which demonstrated efficacy of diuretics, used chlorthalidone rather than HCTZ. One study also suggests chlorthalidone is better than HCTZ in a single-blinded trial. This may be due to the longer t½ of chlorthalidone (40 hrs.). The standard dose should be 12.5 mg, and should not exceed 25 mg, since this is a more potent drug than HCTZ and causes significant hypokalemia in doses >25 mg. Chlorthalidone does not come in a 12.5 mg pill. Use half of the 25 mg pill. The 15 mg pill is quite expensive and should be avoided. If renal function is significantly impaired (e.g., creatinine >1.7mg/dL), thiazide diuretics are ineffective and loop diuretics (furosemide, torsemide) are preferred therapy.

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[1] High risk = renal disease, hx CAD or CHF, diabetes, etc.