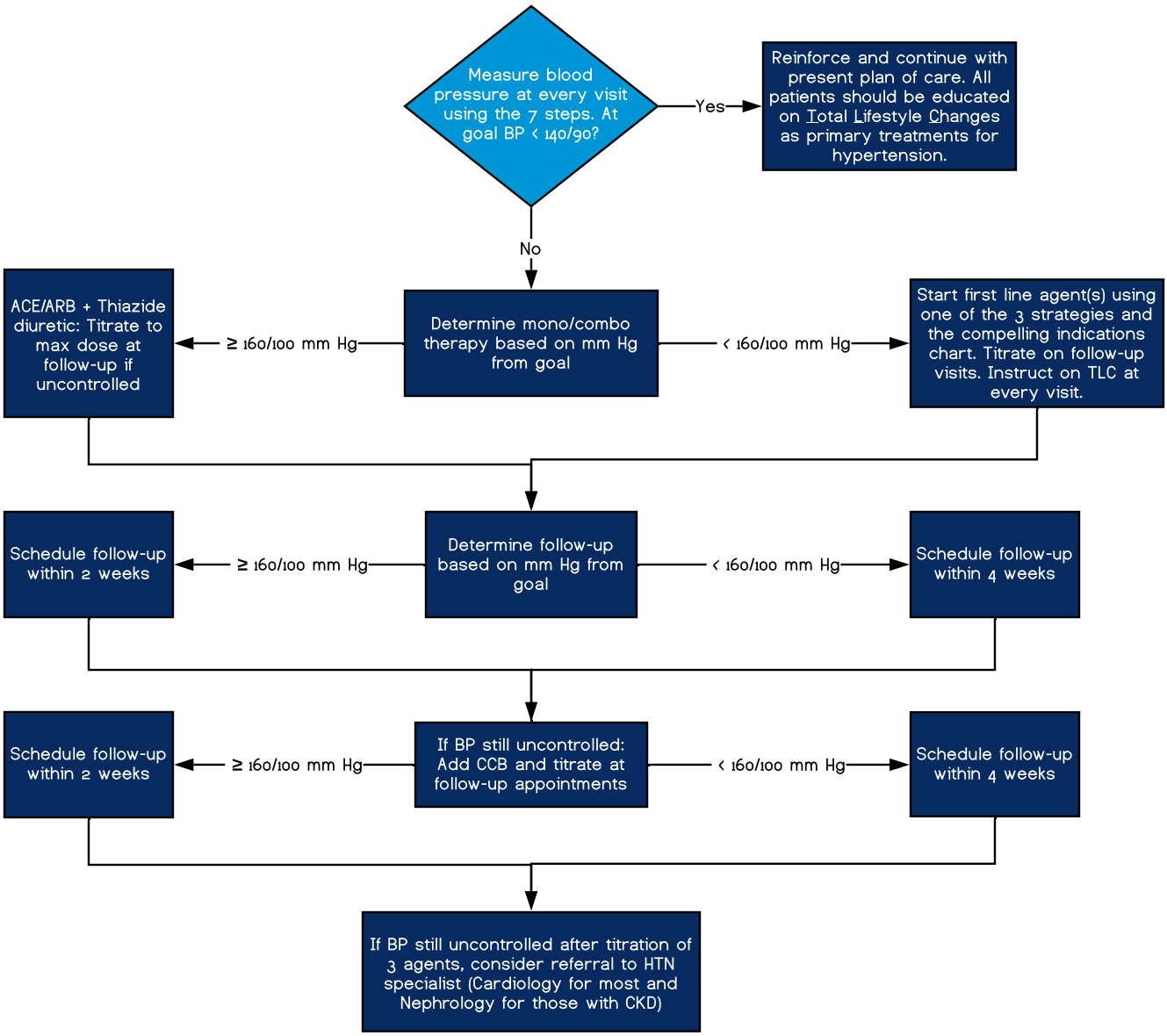
# Care Pathway

## Primary Care Hypertension Guidelines Algorithm

*General Approach for most patients under age 80**

*HTN patients that are controlled should be seen every 6 months.*



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| Effect of Therapeutic Lifestyle Changes (TLC) on BP | | |
|---|---|---|
| Lifestyle Change | Recommendation | Approximate Reduction in SBP |
| Weight reduction | maintain a normal body weight (BMI 19-25) | 5-20 mm Hg per 10 kg lost |
| Dash diet | consume a diet rich in fruits, vegetables, and low-fat dairy products with a reduced content of saturated fat and total fat | 8-14 mm Hg |
| Low-sodium diet | consume < 2400 mg of sodium per day | 2-8 mm Hg |
| Increase physical activity | regular aerobic physical activity (i.e., brisk walking at least 40 minutes/session 3-4 days a week) | 4-9 mm Hg |
| Limit alcohol consumption | less than 2 drinks/day and most men or less than 1 drink/day in women and lighter weight persons (1 drink = 12 oz. beer, 5 oz. wine, 1.5 oz. hard alcohol) | 2-4 mm Hg |
| Smoking cessation | quit smoking | (not reported) - known to reduce risk of developing cardiovascular disease |

| Three strategies for treating Hypertension: | |
|---|---|
| Strategy | Description |
| A | Start one drug, titrate to maximum dose, and then add a second drug. |
| B | Start one drug, then add a second drug before achieving max dose of first. |
| C | Begin two drugs at the same time, as separate pills or combination pill. Initial combination therapy is recommended if BP is greater than 20/10 mmHg above goal. |

| Compelling indications for treatment choices: | |
|---|---|
| Indication | Treatment choices |
| Heart failure | ACEI/ARB + BB + diuretic + spironolactone |
| Post MI/clinical CAD | ACEI/ARB and BB |
| CAD | ACEI/ARB, BB, diuretic, CCB |
| Diabetes | ACEI/ARB, CCB, diuretic |
| CKD | ACEI/ARB |
| Recurrent stroke prevention | ACEI, diuretic |
| Black race | CCB, Thiazide or CCB+thiazide |
| Pregnancy | Labetalol (first line), nifedipine, methyldopa |

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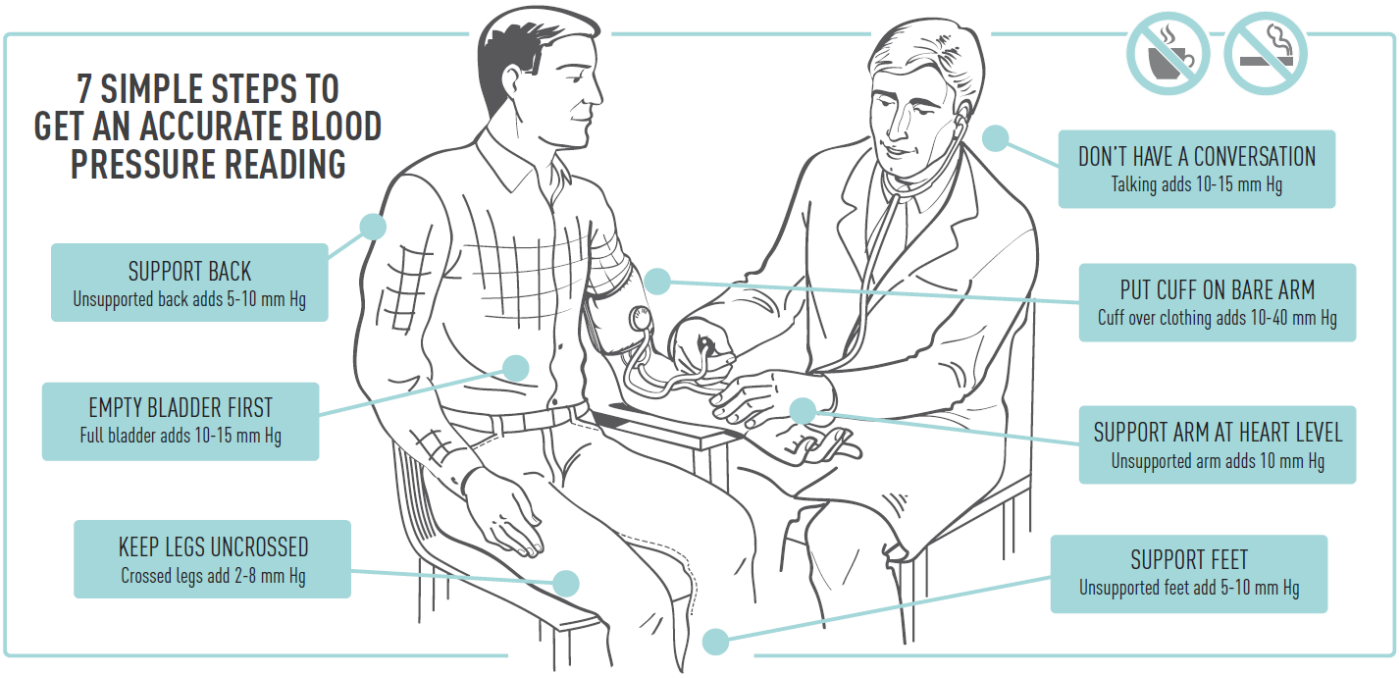
| DRUG CHOICES | | |
|---|---|---|
| Drug class | Agents of choice | Comments |
| Diuretics | Thiazides: HCTZ 12.5–50 mg, chlorthalidone 12.5–25 mg, indapamide 1.25–2.5 mg<br>K+ sparing: spironolactone 25–50 mg, amiloride 5–10 mg, triamterene 100 mg<br>Loop diuretic: Furosemide 20–80 mgs twice daily, torsemide 10–40 mg | Monitor for hypokalemia<br>Most side effects are metabolic in nature<br>Most effective when combined with ACEI<br>Stronger clinical evidence with chlorthalidone<br>Spironolactone–gynecomastia and hyperkalemia<br>Loop diuretics may be needed when GFR less than 40 mL/min |
| ACEI/ARB | ACEI: lisinopril, benazapril, fosinopril and quinapril 10-40mg, ramipril 5-10mg, trandolapril 2-8mg<br>ARB: candesartan 8-32mg, valsartan 80-320mg, losartan 50-100mg, olmesartan 20-40mg, telmisartan 20-80mg | SE: Cough (ACEI only), angioedema (more with ACEI), hyperkalemia<br>Losartan lowers uric acid levels; candesartan may prevent migraine headaches |
| Beta blockers | Metoprolol succinate 50-100mg and tartrate 50-100mg twice daily, nebivolol 5-10mg, propranolol 40-120mg twice daily, carvedilol 6.25-25mg twice daily, bisoprolol 5-10mg, labetalol 100-300mg twice daily | Not first line agents – reserve for post-MI/CHF<br>Cause fatigue and decreased heart rate<br>Adversely affect glucose; mask hypoglycemic awareness |
| Calcium channel blockers | Dihydropyridines: amlodipine 5-10mg, nifedipine ER 30-90mg,<br>Non-dihydropyridines: diltiazem ER 180-360 mg, verapamil 80-120mg 3 times daily or ER 240-480mg | Cause edema; dihydropyridines may be safely combined w/ B-blocker<br>Non-dihydropyridines reduce heart rate and proteinuria |



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| CONSIDERATIONS FOR UNCONTROLLED BLOOD PRESSURE | | |
|---|---|---|
| Measurement Technique | Medications | Secondary Etiologies |
| Was protocol followed? (Proper position, no caffeine, etc.) | Medication non-adherence | Obstructive sleep apnea, primary aldosteronism, chronic kidney disease, renal artery stenosis, pheochromocytoma, Cushing's disease, aortic coarctation |
| White coat effect?<br>Consider BP checks by medical assistant (2 checks with 2 readings each, one week apart) | Interfering agents (NSAIDs, excess alcohol, Sudafed, etc.) | Consider consultation with a hypertension specialist. |
| Consider home BP monitoring for persistent white coat effect.<br>Document home BP at office visit. | Avoid using clonidine, verapamil, or diltiazem together with a beta blocker. These heart rate-slowing drug combinations may cause symptomatic bradycardia over time. | |

| SUGGEST LAB MONITORING | | |
|---|---|---|
| Drug class | Suggested lab follow-up | Lab interval |
| Diuretics | Thiazides: BMP<br>Look diuretics: CMP, CBC<br>K sparing: BMP | At baseline, after titration |
| ACEI/ARB | BMP | At baseline, after titration. Consider renal artery evaluation if suspect |
| Beta blockers | Creatinine. Monitor HR for bradycaria | At baseline. Check HR every visit. |
| Calcium channel blockers | No routine labs recommended. | |
| Vasodilators | Hydralazine:CR/CBC and ANA<br>Minoxidil: BUN/CR | Baseline/Baseline and periodically if prolonged.<br>Baseline. |

*Older adults who are frail, those older than 80 years, and those with low blood pressures (<130/70 mmHg using manual measurements) may be more likely to develop significant side effects with blood pressure lowering, and reaching targets may therefore be difficult. In addition, when treating older patients with isolated systolic hypertenstion, the diastolic blood pressure should be reduced to a minimum post-treatment value of >60 mmHg DBP and >130 mmHg SBP.