



Hypertension: Did you know?

- ↑ B/P is one of the leading causes of **preventable death** in the world. As age increases, lifetime risk for hypertension is > 90%.
- 50% of Canadians over 65 years have ↑ B/P. Over 5 million Canadians with ↑ B/P are on pharmacotherapy.
- Over 90% of hypertensive patients have additional cardiovascular (CV) risks that require screening, assessment and management (e.g., high blood sugar, high lipid levels, obesity, abdominal obesity, smoking, sedentary lifestyle). Successful management of risks, ↓ CV events by up to 60%. In diabetic patients, 75% of CV disease is due to ↑ B/P. Death and disability can be ↓ in diabetics by up to 50% when hypertension is treated.

- Blood pressure (B/P):

| Optimal | Normal | High Normal |
|----------------|----------------|----------------------|
| < 120 and < 80 | < 130 and < 85 | 130 - 139 or 85 - 89 |

- Hypertension is a blood pressure over 140/90 or over **130/80** in individuals with **diabetes** or chronic kidney disease.
- Target B/P (at home) should be less than 135/85. If above target, reassess every two months.
- **Lifestyle modifications** are the **cornerstone** of hypertension management and must be **advocated** as follows:
 - Maintaining a diet low in salt (adequate adult intake 1500mg – upper limit 2300mg) and saturated fats, and high in fresh fruits and vegetables while using low fat dairy products - “DASH” (Dietary Approaches to **Stop** Hypertension) diet. Many processed and restaurant foods contain high amounts of sodium per serving.
 - 30 to 60 minutes of accumulated (or continuous) moderate intensity dynamic activity (e.g., walking, swimming, biking, jogging... anything ending in “ing”) four to seven days per week.
 - Weight reduction in those who are overweight.
 - Alcohol reduction in those who drink more than two standard drinks per day.
 - A smoke free environment and tobacco cessation to reduce CV and cancer risks.
 - Maintaining normal blood sugar levels.
 - Encourage use of home blood pressure monitoring with approved device and proper technique.
- Most individuals will require two or more drugs in addition to lifestyle therapies to achieve recommended B/P targets. The average reduction in B/P lowering with lifestyle changes or a single B/P medication is 10/5. Combining medications (e.g., diuretic with ACE) can be expected in the management of hypertension. In hypertensive **diabetics**, **3 or more** B/P lowering medications are often required.
- **Focus on adherence.** Non-adherence to lifestyle and pharmacotherapy is a major cause of poor B/P control and contributes to ↑ overall CV risk. Help patients adhere to therapy. Encourage patients to seek information or join support groups: www.myBPsite.ca or www.heartandstroke.ca/BP or www.sodium101.ca.
- Examples of drugs, conditions and substances that can induce or aggravate hypertension:
 - Steroids, NSAIDS, oral contraceptives
 - Stimulants including illicit drugs (e.g., cocaine), decongestants
 - Sleep apnea
 - **Excess dietary sodium is a significant cause of hypertension.** See www.lowersodium.ca; www.nhlbi.nih.gov/health/public/heart/hbp/dash/new_dash.pdf



Download current patient and professional resources from www.hypertension.ca/tools

Sign up for new and regularly updated professional resources at www.htnupdate.ca

Sources: Blood Pressure Canada Sodium Policy, Canadian Hypertension Education Program Recommendations, 2010; Report from the Canadian Chronic Disease Surveillance System: Hypertension in Canada, 2010

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Considerations in the Individualization of Antihypertensive Therapy*

| | <i>Initial Therapy</i> | <i>Second-line Therapy</i> | <i>Notes and/or Cautions</i> |
|---|---|---|--|
| HYPERTENSION WITHOUT OTHER COMPELLING INDICATIONS | | | |
| | | | TARGET BLOOD PRESSURE < 140/90 mmHg |
| Diastolic+/- Systolic Hypertension | Thiazide diuretics, beta blockers, ACE-inhibitors, ARBs, or long-acting calcium channel blockers (consider ASA and statins in selected people). Consider initiating therapy with a combination of two first line drugs if the blood pressure is ≥ 20 mmHg systolic or ≥ 10 mmHg diastolic above target. | Combinations of first-line drugs | Beta-blockers are not recommended as initial therapy in those older than 60 years of age. Hypokalemia should be avoided by using potassium-sparing agents in those who are prescribed diuretics as monotherapy. ACE inhibitors are not recommended in blacks as monotherapy. ACE inhibitors, ARBs and direct renin inhibitors are potential teratogens and caution is required if prescribing to women of child-bearing potential. Combination of an ACE-inhibitor with an ARB is not recommended. |
| Isolated systolic hypertension without other compelling indications | Thiazide diuretics, ARBs or long-acting dihydropyridine calcium channel blockers. | Combinations of first-line drugs | Same as diastolic+/- systolic Hypertension |
| DIABETES MELLITUS | | | |
| | | | TARGET BLOOD PRESSURE < 130/80 mmHg |
| Diabetes mellitus with albuminuria ¹ | ACE inhibitors or ARBs | Addition of thiazide diuretics, cardioselective beta-blockers, long-acting CCBs | If the serum creatinine level is $>150 \mu\text{mol/L}$, a loop diuretic should be used as a replacement for low-dose thiazide diuretics if volume control is required |
| Diabetes mellitus without albuminuria ¹ | ACE inhibitors, ARBs, dihydropyridine CCBs or thiazide diuretics | Combination of first-line drugs or if first line agents are not tolerated addition of cardioselective beta-blockers and/or long-acting non dihydropyridine CCBs | Normal albumin to creatinine ratio [ACR] $< 2.0 \text{ mg/mmol}$ in men and $< 2.8 \text{ mg/mmol}$ in women Combination of an ACE-inhibitor with an ARB is specifically not recommended. |
| CARDIOVASCULAR DISEASE | | | |
| | | | TARGET BLOOD PRESSURE <140/90 mmHg |
| Coronary artery disease | ACE inhibitors or ARBs (except in low-risk patients); beta blockers for patients with stable angina | Long-acting CCBs. When combination therapy is being used for high risk patients, an ACE inhibitor/ dihydropyridine CCB is preferred | Avoid short-acting nifedipine. Combination of an ACE-inhibitor with an ARB is specifically not recommended. |
| Prior myocardial infarction | Beta-blockers, ACE inhibitors (ARBs if ACE inhibitor intolerant) | Long-acting CCBs | Combination of an ACE-inhibitor with an ARB is specifically not recommended. |
| Heart failure | ACE inhibitors (ARBs if ACE inhibitor-intolerant) and beta-blockers. Spironolactone in patients with NYHA class III or IV symptoms. | ARB in addition to ACE inhibitor. Hydralazine/isosorbide dinitrate combination Thiazide or loop diuretics, are recommended as additive therapy | Titrate doses of ACEI and ARB to those used in clinical trials. Avoid nondihydropyridine CCBs (diltiazem, verapamil). Monitor potassium and renal function if combining an ACE inhibitor with ARB. |
| Left ventricular hypertrophy | Does not affect initial treatment recommendations | Combination of additional agents | Hydralazine and minoxidil can increase left ventricular hypertrophy. |
| Past stroke or TIA | ACE inhibitor/diuretic combinations | Combination of additional agents | This does not apply to acute stroke. Blood pressure reduction reduces recurrent strokes in stable patients. Combination of an ACE-inhibitor with an ARB is specifically not recommended. |
| NON-DIABETIC CHRONIC KIDNEY DISEASE | | | |
| | | | TARGET BLOOD PRESSURE <130/80 mmHg |
| Non-diabetic chronic kidney disease with proteinuria ² | ACE inhibitors (ARBs if ACE inhibitor-intolerant) if there is proteinuria. Diuretics as additive therapy | Combinations of additional agents | Avoid ACE inhibitors or ARB if bilateral renal artery stenosis or unilateral disease with solitary kidney. Patients placed on an ACE inhibitor or an ARB should have their serum creatinine and potassium carefully monitored. Combinations of an ACE-inhibitor and ARB are specifically not recommended in patients with chronic kidney disease without proteinuria |
| Renovascular disease | Does not affect initial treatment recommendations | Combinations of additional agents | Avoid ACE inhibitors or ARB if bilateral renal artery stenosis or unilateral disease with solitary kidney. |
| OTHER CONDITIONS | | | |
| | | | TARGET BLOOD PRESSURE < 140/90 mmHg |
| Peripheral arterial disease | Does not affect initial treatment recommendations | Combinations of additional agents | Avoid beta-blockers with severe disease |
| Dyslipidemia | Does not affect initial treatment recommendations | Combinations of additional agents | |
| Overall vascular protection | Statin therapy for patients with 3 or more cardiovascular risk factors or with atherosclerotic disease Low dose ASA in patients with controlled blood pressure | | Caution should be exercised with the ASA recommendation if blood pressure is not controlled. |

* With permission of the Canadian Hypertension Education Program (CHEP).

¹Albuminuria is defined as persistent albumin to creatinine ratio [ACR] $>2.0 \text{ mg/mmol}$ in men and $>2.8 \text{ mg/mmol}$ in women. ² Proteinuria is defined as urinary protein $>500 \text{ mg/24hr}$ or albumin to creatinine ratio [ACR] $>30 \text{ mg/mmol}$.

ACE Angiotensin-converting enzyme; **ARB** Angiotensin receptor blocker; **ASA** Acetylsalicylic acid; **CCB** Calcium channel blocker; **NYHA** New York Heart Association; **TIA** Transient ischemic attack.