

Tables 1–8

2009 Canadian Hypertension Education Program recommendations

An annual update

On behalf of the Canadian Hypertension Education Program
Can Fam Physician 2009;55:697–700

Table 1. Considerations in the individualization of antihypertensive therapy

CONDITIONS	INITIAL THERAPY	SECOND-LINE THERAPY	ADDITIONAL NOTES
Hypertension without other compelling indications—Target BP < 140/90 mm Hg			
Diastolic hypertension with or without systolic hypertension	Thiazide diuretics, β -blockers, ACE inhibitors, ARBs, or long-acting CCBs (consider ASA and statins in selected patients). Consider initiating therapy with a combination of 2 first-line drugs if BP is ≥ 20 mm Hg systolic or ≥ 10 mm Hg diastolic above target	Combinations of first-line drugs	β -Blockers are not recommended initial therapy in those > 60 y. Hypokalemia should be avoided by using potassium-sparing agents for those who are prescribed diuretics as monotherapy. ACE inhibitors are not recommended as monotherapy for black patients. ACE inhibitors, ARBs, and direct rennin inhibitors are potential teratogens and caution is required if prescribing to women with childbearing potential. Combination of ACE inhibitors with ARBs is specifically not recommended
Isolated systolic hypertension without other compelling indications	Thiazide diuretics, ARBs, or long-acting dihydropyridine CCBs	Combinations of first-line drugs	Same as above
Diabetes mellitus—Target BP < 130/80 mm Hg			
Diabetes mellitus with nephropathy	ACE inhibitors or ARBs	Addition of thiazide diuretics, cardioselective β -blockers, or 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 nephropathy	ACE inhibitors, ARBs, dihydropyridine CCBs, or thiazide diuretics	Combination of first-line drugs or, if those are not tolerated, addition of cardioselective β -blockers or long-acting non-dihydropyridine CCBs	Normal albumin to creatinine ratio < 2.0 mg/mmol in men and < 2.8 mg/mmol in women. Combination of ACE inhibitors with ARBs is specifically not recommended

Table 1 continues


Table 1 continued

CONDITIONS	INITIAL THERAPY	SECOND-LINE THERAPY	ADDITIONAL NOTES
Cardiovascular and cerebrovascular disease—Target BP < 140/90 mm Hg			
Angina	β-Blockers and ACE inhibitors except in low-risk patients	Long-acting CCBs	Avoid short-acting nifedipine. Combination of ACE inhibitors with ARBs is specifically not recommended
Prior myocardial infarction	β-Blockers and ACE inhibitors (use ARBs in ACE inhibitor-intolerant patients)	Long-acting CCBs	Combination of ACE inhibitors with ARBs is specifically not recommended
Heart failure	ACE inhibitors (ARBs if ACE inhibitor-intolerant) and β-blockers; spironolactone in patients with NYHA class III or IV symptoms	ARBs in addition to ACE inhibitors. Hydralazine/isosorbide dinitrate (thiazide or loop diuretics as additive therapy)	Titrate doses of ACE inhibitors and ARBs to those used in clinical trials. Avoid non-dihydropyridine CCBs (diltiazem, verapamil). Monitor potassium and renal function if combining ACE inhibitors and ARBs
Left ventricular hypertrophy	Does not affect initial treatment recommendations	Combinations of additional agents	Hydralazine and minoxidil can increase left ventricular hypertrophy
Past cerebrovascular accident or TIA	ACE inhibitor and diuretic combinations	Combinations of additional agents	This does not apply to acute stroke. BP reduction reduces recurrent cerebrovascular events in patients with stable past cerebrovascular disease. Combination of ACE inhibitors with ARBs is specifically not recommended
Nondiabetic chronic kidney disease—Target BP < 130/80 mm Hg			
Nondiabetic chronic kidney disease with proteinuria	ACE inhibitors (ARBs if ACE inhibitor-intolerant) if there is proteinuria. Diuretics as additive therapy	Combinations of additional agents	Avoid ACE inhibitors or ARBs in patients with bilateral renal artery stenosis or unilateral disease with solitary kidney. Patients taking ACE inhibitors or ARBs should have their serum creatinine and potassium carefully monitored. Combination of ACE inhibitors and ARBs is specifically not recommended
Renovascular disease	Does not affect initial treatment recommendations	Combinations of additional agents	Avoid ACE inhibitors or ARBs in patients with bilateral renal artery stenosis or unilateral disease with solitary kidney
Other conditions—Target BP < 140/90 mm Hg			
Peripheral arterial disease	Does not affect initial treatment recommendations	Combinations of additional agents	Avoid β-blockers in patients with severe onset of disease
Dyslipidemia	Does not affect initial treatment recommendations	Combinations of additional agents	None
Overall vascular protection	Statin therapy in patients with 3 or more cardiovascular risk factors or with atherosclerotic disease. Low-dose ASA in patients with controlled BP	None	Caution should be exercised with the ASA recommendation if BP is not controlled

ACE—angiotensin-converting enzyme, ARB—angiotensin II receptor blocker, ASA—acetylsalicylic acid, BP—blood pressure, CCB—calcium channel blocker, NYHA—New York Heart Association, TIA—transient ischemic attack.

Reprinted with permission from the Canadian Hypertension Education Program.

Table 2. Patient instructions for home BP measurement

PURCHASING EQUIPMENT	
• Buy an approved machine marked by the  logo	
• Make sure the device has a cuff size that is correct for you. Ask for help if you are unsure	
MEASURING BP	
• Follow the directions that come with the device	
• Only measure and record BP if you have time to do it correctly	
• Do not measure BP when you are uncomfortable, cold, anxious, stressed, or in pain	
• Wait for at least 2 hours after heavy physical activity (eg, long run) and at least a half hour after light physical activity (eg, short walk), drinking coffee, or smoking	
• Empty your bladder or bowels if experiencing discomfort before taking a reading	
• It is very important to rest and relax for 5 minutes in a quiet, comfortable place, with no distractions (eg, television or talking) before measuring your BP	
• Put the cuff on a bare arm or one that has a thin sleeve	
• Sit in a chair that supports your back and beside a table that can support your arm. If required, put a pillow or towel under your arm so that it rests at heart level (Figure 1). Do not cross your legs	
• Measure BP in the morning before taking medications or eating and in the evening before going to bed, bathing, or taking medications	
• Take at least 2 readings and record them with the date and time	

BP—blood pressure.

Figure 1. Proper position to measure blood pressure



Reprinted with permission from the Canadian Hypertension Education Program

Table 3. Target values for blood pressure: Office measurement values vary depending on certain conditions.

SETTING	TARGET, MM HG
Home	
• Home blood pressure and daytime ABPM*	< 135/85
Office	
• Diastolic hypertension with or without systolic hypertension	< 140/90
• Isolated systolic hypertension	< 140
• Diabetes	< 130/80
• Chronic kidney disease	< 130/80

ABPM—ambulatory blood pressure monitoring.

*The target value readings taken by home measurement and ABPM in those with diabetes or chronic kidney disease have not been established.

Reprinted with permission from the Canadian Hypertension Education Program.

Table 4. Lifestyle therapies to reduce the possibility of becoming hypertensive, reduce blood pressure, and reduce the risk of blood pressure–related cardiovascular complications in people with hypertension

INTERVENTION
A healthy diet high in fresh fruits, vegetables, low-fat dairy products, dietary and soluble fibre, whole grains, and protein from plant sources; and low in saturated fat, cholesterol, and salt, in accordance with Canada's Guide to Healthy Eating
Regular physical activity: accumulation of 30–60 min of moderate intensity dynamic exercise 4–7 d/wk in addition to daily activities
Low-risk alcohol consumption (≤ 2 standard drinks/d; < 14/wk for men and < 9/wk for women)
Attaining and maintaining ideal body weight (BMI of 18.5–24.9 kg/m ²)
A waist circumference of <ul style="list-style-type: none"> • < 94 cm for men of European ancestry • < 80 cm for women of European ancestry • < 90 cm for men of South Asian, Japanese, or Chinese ancestry • < 80 cm for women of South Asian, Japanese, or Chinese ancestry
Reduction in sodium intake to < 2300 mg/d
A smoke-free environment

BMI—body mass index.

Reprinted with permission from the Canadian Hypertension Education Program.

Table 5. Ways to reduce intake of dietary sodium

Do
• Buy and eat more fresh foods, especially fruit and vegetables
• Choose processed foods with low-salt labels or brands that have the lowest percentage of sodium on their food labels
• Wash canned foods or other salty foods in water before eating or cooking
• Use unsalted spices to make foods taste better, if desired
• Eat less food at restaurants and fast-food outlets, and ask for less salt to be added in your food orders
• Use less sauces on your food
• Eat foods with less than 200 mg of sodium or less than 10% of the daily value per serving
Do not
• Buy or eat heavily salted foods (eg, pickled foods, salted crackers or chips, processed meats)
• Add salt in cooking and at the table
• Eat foods with more than 400 mg of sodium or more than 20% of the daily value per serving

Reprinted with permission from Blood Pressure Canada

Table 6. Internet resources for patient information: Many of these resources can be downloaded and printed or hard copies ordered for patients who do not use the Internet.

RESOURCE	DESCRIPTION	WEBSITE
2008 public hypertension recommendations	General information on prevention and treatment of hypertension	www.hypertension.ca/bpc
2009 patient hypertension recommendations	Specific information on the management of hypertension in patients with diabetes	www.hypertension.ca/bpc
On-line personalized blood pressure plan	Create a personalized action plan for healthy living	www.heartandstroke.ca/BP
DASH diet	The DASH diet and healthy eating advice to improve blood pressure control	www.nhlbi.nih.gov/hbp/prevent/h_eating/h_eating.htm
Canada's Food Guide	Canada's official guide to healthy eating and lifestyle choices. Personalize your own food guide	www.hc-sc.gc.ca/fn-an/food-guide-aliment/index_e.html
Dietitians of Canada	Tips for eating well and living well	www.dietitians.ca
On-line health and fitness calculators	Learn about risk factors using different tools to calculate your personal factors	www.healthtoolsonline.com/health-fit.html
Canadian Diabetes Association	Information on hypertension for people with diabetes	www.diabetes.ca
Heart and Stroke Foundation	Information on how controlling blood pressure can reduce your chance of developing heart disease or having a stroke	www.heartandstroke.ca

DASH—dietary approaches to stop hypertension.
 Reprinted with permission from Blood Pressure Canada.

Table 7. Strategies to improve patient adherence**Assist patients in adherence**

- Tailor pill-taking to fit patients' daily habits
- Simplify medication regimens to once-daily doses
- Replace 2 antihypertensive agents with a fixed-dose combination (where available and appropriate), provided it is the same combination the patient is already taking
- Use unit-of-use packaging (ie, several medications to be taken together)
- Identify potential barriers to adherence

Help patients become more involved in their treatment

- Encourage greater responsibility or autonomy among patients in monitoring their blood pressure and adjusting their prescriptions
- Educate patients and patients' families about their disease and treatment regimens

Improve your management in the office and beyond

- Assess adherence to pharmacologic and nonpharmacologic therapy at every visit
- Encourage adherence to therapy by out-of-office contact (either by telephone or mail), particularly over the first 3 months of therapy
- Coordinate with health care providers at patients' work sites to improve monitoring of adherence with pharmacologic and lifestyle modification prescriptions
- Use electronic medication compliance aids
- Use a multidisciplinary team approach

Reprinted with permission from the Canadian Hypertension Education Program.

Table 8. The Canadian Hypertension Education Program: A) team, B) elements.

A) TEAM	DETAILS
Steering committee	Blood Pressure Canada Canadian Council of Cardiovascular Nurses Canadian Hypertension Society Canadian Pharmacists Association College of Family Physicians of Canada Heart and Stroke Foundation of Canada Public Health Agency of Canada
Volunteers	More than 100 volunteers from clinical practice, academia, and government Recommendations Taskforce, with more than 50 clinical and academic volunteers
Administrative support	Susan Carter at Debut Medical Education
B) ELEMENTS	DETAILS
Evidence based	Centred on a core group of evidence-based medicine experts who do not have potential commercial conflicts of interest
Knowledge translation	Implementation Taskforce, with more than 25 volunteers from nursing, pharmacy, family medicine, and health education to translate the recommendations to meet discipline-specific needs and to facilitate interdisciplinary care
Outcomes evaluation	Outcomes Research Taskforce, with more than 40 volunteers from academia and government to assess the effects of the program on an ongoing basis
Patient oriented	Close association with Blood Pressure Canada to develop patient resources for self-efficacy and knowledge translation