

2008 Canadian Hypertension Education Program recommendations

An annual update

On behalf of the Canadian Hypertension Education Program

For the Canadian Hypertension Education Program, 2008 marks the ninth consecutive year that recommendations for the management of hypertension, with the goal of preventing cardiovascular disease, have been updated. The program follows a rigorous, systematic, evidenced-based approach to annually updating therapeutic recommendations. This year's update focused on the health care professional's role in encouraging appropriate patients to properly measure their blood pressure at home.

Blood pressure measurement at home

Blood pressure measurements taken at home have a stronger association with cardiovascular prognosis than office-based readings. Home measurement can confirm the diagnosis of hypertension, improve blood pressure control, reduce the need for medications in some patients, help identify white-coat and masked hypertension, and improve medication adherence in non-adherent patients. Health care professionals should encourage appropriate patients to assess their blood pressures properly at home. Brief patient instructions can be found on **CFPlus**.*

Instructions for purchasing and using home blood pressure measurement devices can be found at www.hypertension.ca and www.heartandstroke.ca/BP. The latter site's e-health tool, the Blood Pressure Action Plan, has an interactive self-management portal ("My Health on Track") for patients that provides a mechanism for recording and monitoring blood pressure measurements, medications, and lifestyle changes and encourages positive steps toward better blood pressure management. General sources for patient information on hypertension can be found in **Table 1**.

Other key recommendations

All Canadian adults require blood pressure assessment at all appropriate clinical visits. Blood pressure increases with age, such that 50% of Canadians older than age 65 have hypertension. For those with normal blood pressure at age 55, more than 90% will



*Additional tools for blood pressure and hypertension management are available at www.cfp.ca. Go to the full text of this article on-line, then click on CFPlus in the menu at the top right-hand side of the page.

Table 1. 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 www.heartandstroke.ca
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.
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develop hypertension within an average lifespan. To identify hypertension, all adults require ongoing assessment of blood pressure throughout their lives and those with high-normal blood pressures require annual assessment.

Optimum management requires assessment of other cardiovascular risk factors (smoking, dyslipidemia, diabetes, sedentary behaviour, and unhealthy eating). More than 90% of Canadians with hypertension have other cardiovascular risk factors. Identifying and managing risk factors beyond hypertension can reduce the overall risk of cardiovascular disease by more than 60% and can alter the blood pressure target (Table 2) and specific classes of antihypertensive medications recommended (Table 3).

Lifestyle modifications are effective in reducing blood pressure and cardiovascular risks. Hypertension can be prevented, blood pressure can be reduced, and other cardiovascular risks can be improved by a healthy diet, regular physical activity, moderation in alcohol

Table 2. 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 3. 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 for black patients. ACE inhibitors and ARBs are teratogenic and caution is required if prescribing to women with childbearing potential
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, long-acting CCBs, or an ARB and ACE inhibitor combination	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
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
Prior myocardial infarction	β -Blockers and ACE inhibitors (use ARBs in ACE inhibitor-intolerant patients)	Long-acting CCBs	None

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CONDITIONS	INITIAL THERAPY	SECOND-LINE THERAPY	ADDITIONAL NOTES
Heart failure	ACE inhibitors (ARBs if ACE inhibitor-intolerant) and β -blockers; spironolactone in patients with NYHA class III or IV symptoms	ARBs or 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	ACE inhibitors, ARBs, dihydropyridine CCBs, diuretics, (β -blockers in patients <55 y)	None	Avoid hydralazine and minoxidil
Past cerebrovascular accident or TIA	ACE inhibitor and diuretic combinations	None	This does not apply to acute stroke. BP reduction reduces recurrent cerebrovascular events in patients with stable past cerebrovascular disease. BP lowering should be considered in those with normal BP who have had strokes
Non-diabetic chronic kidney disease—Target BP <130/80 mm Hg			
Non-diabetic chronic kidney disease with proteinuria	ACE inhibitors (ARBs if ACE inhibitor-intolerant), with 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
Renovascular disease	Similar to diastolic with or without systolic hypertension without compelling indications for other medications	None	Avoid ACE inhibitors or ARB in patients with bilateral renal artery stenosis or unilateral disease with solitary kidney. Patients placed on ACE inhibitors or ARBs should have their serum creatinine and potassium carefully monitored
Other conditions—Target BP <140/90 mm Hg			
Peripheral arterial disease	Does not affect initial treatment recommendations	Does not affect initial treatment recommendations	Avoid β -blockers in patients with severe onset of disease
Dyslipidemia	Does not affect initial treatment recommendations	Does not affect initial treatment recommendations	None
Global 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.

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consumption, reductions in dietary sodium, and, in some, stress reduction (Table 4). Simple and brief health care professional interventions markedly increase the probability of patient adherence to lifestyle changes. A section of the Heart and Stroke Foundation website (www.heartandstroke.ca/BP) has been designed to assess hypertensive patients' lifestyles and provides individualized approaches and monitoring to assist lifestyle changes.

Treat patients to the recommended targets to achieve optimum cardiovascular risk reduction. Greater

reduction in cardiovascular disease is achieved by lowering blood pressure to the appropriate targets (Table 2).

Combination therapy (both drugs and lifestyle changes) is generally necessary to achieve target blood pressures. Most patients require more than 1 anti-hypertensive drug combined with lifestyle changes to achieve recommended blood pressure targets. When using 2 drugs to lower blood pressure, combinations of β -blockers, angiotensin-converting enzyme

Table 4. Lifestyle therapies to reduce the possibility of becoming hypertensive, reduce blood pressure, and reduce the risk of blood pressure-related cardiovascular complications

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"> • < 102 cm for men • < 88 cm for women
Reduction in sodium intake to < 2300 mg/d
A smoke-free environment

BMI—body mass index.
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inhibitors, or angiotensin receptor blockers produce a less-than-additive hypotensive effect. If blood pressure is $> 20/10$ mm Hg above target, therapy can be initiated with a combination of 2 first-line antihypertensive drugs.

Monitor patients whose blood pressure is above target at least every 2 months. To achieve blood pressure control, follow-up at short intervals is required to improve patient adherence to therapy and to increase the intensity of treatment.

Focus on adherence. Nonadherence to therapy is one of the biggest challenges to improving blood pressure control. Adherence to therapy should be assessed at each visit and specific interventions (visit **CFPlus***) can help improve patient adherence to therapy. 

The **Canadian Hypertension Education Program** is overseen by a steering committee that includes the Canadian Council of Cardiovascular Nurses, the Canadian Pharmacy Association, the College of Family Physicians of Canada, the Public Health Agency of Canada, the Canadian Hypertension Society, Blood Pressure Canada, and the Heart and Stroke Foundation of Canada. The program is unique in having a specific implementation task force with subgroups of family physicians, nurses, pharmacists, and medical specialists to oversee translation of the recommendations into education material suited to their disciplines; the program also has a task force to evaluate whether the process is improving hypertension management in Canada.

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Competing interests

None declared

Resources

A version of the hypertension recommendations designed for patient and public education has been developed to assist health care practitioners in managing hypertension. The summary is available electronically at www.hypertension.ca and www.heartandstroke.ca. Bulk orders of 25 or more copies can be obtained by contacting hyperten@ucalgary.ca. A free, confidential, Web-based tool for patients is available at www.heartandstroke.ca/BP. Developed by the Heart and Stroke Foundation, the Blood Pressure Action Plan enables patients to build a personalized action plan tailored to their risk profiles, promotes self-management, and helps patients make lifestyle changes, monitor their blood pressure, and print reports for their health care providers.

