

The 2007 Canadian Hypertension Education Program recommendations: The scientific summary – an annual update

The Canadian Hypertension Education Program

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The present paper summarizes and highlights key messages of the 2007 Canadian Hypertension Education Program recommendations for the management and diagnosis of hypertension. This is the eighth annual update. Important new messages in the 2007 Canadian Hypertension Education Program recommendations emphasize the need for assessing adults with high normal blood pressure on an annual basis and reducing sodium in the diet of Canadians to less than 100 mmol/day. These new recommendations still need to be incorporated into the older but still important considerations for the diagnosis, management and treatment of patients with hypertension, namely, assessing blood pressure in all adults at all appropriate visits, expediting the diagnosis of hypertension, assessing and managing global cardiovascular risk, emphasizing that lifestyle modifications are the cornerstone of antihypertensive therapy, treating to target to achieve optimum cardiovascular risk reduction, using combinations of antihypertensive medications and lifestyle to achieve recommended targets and focusing on adherence to therapy. Minor changes in pharmacological therapies and some new recommendations on routine laboratory tests are discussed.

Key Words: *Clinical practice guidelines; Consensus; Hypertension; Knowledge translation*

High blood pressure is estimated to be the leading risk factor for death in the world (1). This is a concerning and undesirable status for a health risk that is preventable by following an appropriate lifestyle and is relatively easy to manage. Hypertension affects approximately 25% of the adult Canadian population, and with current lifestyles, more than 90% are likely to develop hypertension (2,3). Historical data have indicated that 40% of hypertensive adults in Canada were unaware that they had hypertension, that approximately two-thirds of those who were aware of having hypertension were treated pharmacologically, and that 13% of hypertensive adults were treated and controlled (4). While Canada awaits new hypertension measurement survey results, current questionnaire surveys indicate that progress has been made. In the first four years after the Canadian Hypertension Education Program (CHEP) was initiated, 1.35 million hypertensive adults were diagnosed, 1.26 million were started on drug treatment, and in 2003, 85% of those who were aware of having

Les recommandations de 2007 du Programme éducatif canadien sur l'hypertension : Le résumé scientifique – une mise à jour annuelle

Le présent article résume et met en lumière les principaux messages des recommandations de 2007 du Programme éducatif canadien sur l'hypertension pour la prise en charge et le diagnostic de l'hypertension. C'est la huitième mise à jour annuelle. Les nouveaux messages importants des recommandations de 2007 du Programme éducatif canadien sur l'hypertension exposent le besoin d'évaluer les adultes ayant une tension artérielle (TA) normale-élevée tous les ans et de réduire la quantité de sel à moins de 100 mmol/jour dans le régime des Canadiens. Ces nouvelles recommandations n'ont pas encore été intégrées aux précédents éléments, qui demeurent toujours importants, pour le diagnostic, la prise en charge et le traitement des patients hypertendus, notamment l'évaluation de la TA chez tous les adultes à toutes les consultations pertinentes, le diagnostic rapide de l'hypertension, l'évaluation et la prise en charge du risque cardiovasculaire global, l'insistance sur les modifications au mode de vie comme pierre angulaire du traitement antihypertenseur, le traitement ciblé afin d'obtenir une réduction optimale du risque cardiovasculaire, le recours à une polythérapie d'antihypertenseurs et de modifications au mode de vie pour obtenir les cibles recommandées et l'orientation sur l'observance du traitement. On discute de la possibilité de changements mineurs aux pharmacothérapies et de nouvelles recommandations pour les examens de laboratoire systématiques.

hypertension were on pharmacotherapy (5). Even more encouraging are the reductions in cardiovascular events that started to occur at a similar time as the marked increases in antihypertensive pharmacotherapy in Canada (6).

Unfortunately, it is predicted that the prevalence of hypertension will rise with an aging, sedentary population that has poor dietary habits and increasing obesity (7). Although the management of hypertension in primary care has made great strides, more work is required to prevent hypertension, applying appropriate lifestyle changes, as well as further improving the pharmacological and lifestyle management of those with hypertension. Part of that effort is keeping health care professionals updated on latest recommendations for the optimal management of hypertension.

This year marks the eighth consecutive year that the CHEP has updated recommendations for the management of hypertension. This year, we have focused on the need to assess blood pressure in all Canadian adults and to annually reassess blood

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TABLE 1
Target values for blood pressure*

Condition	Target blood pressure (mmHg)
Diastolic and/or systolic hypertension	<140/90
Isolated systolic hypertension	<140
Diabetes	<130/80
Chronic kidney disease	<130/80

**It is recommended that normotensive adults with established cardiovascular disease be treated with an angiotensin-converting enzyme inhibitor. Normotensive adults who have had a stroke or transient ischemic attack should be treated with an angiotensin-converting enzyme inhibitor and a diuretic. Reproduced with permission of the Canadian Hypertension Education Program*

pressure in those with high normal values. The very high rate of developing hypertension in those with high normal blood pressure indicates the need to focus more on preventive lifestyle therapies in this subgroup. In addition, the 2007 recommendations support the increasing evidence that hypertension can be prevented through public health interventions in reducing dietary sodium. Coupled with the new evidence on sodium is the recognition that the most effective way to achieve a significant reduction in dietary sodium in the population at large is by reducing sodium additives through the food sector (1,8).

The present article is a short summary of the new CHEP recommendations and supporting research, important issues in hypertension management and the opinions of the CHEP executive on what is required to improve hypertension management in Canada. The full CHEP recommendations are available at <www.hypertension.ca> and are published in the current issue of the *Journal* (pages 529-538 [9] and 539-550 [10]).

The new key messages identified in the 2007 recommendations include the following:

- Adults with high normal blood pressure require annual blood pressure assessment. One in five adult Canadians have high normal blood pressure (130-139/85-89 mmHg). Of those who are overweight and have high normal blood pressure, 40% develop hypertension within two years and 60% develop hypertension within four years. Therefore, annual or more frequent assessments of blood pressure and appropriate lifestyle intervention to prevent hypertension are recommended for those with high normal blood pressure.
- Sodium must be reduced in the diets of Canadians. Excess dietary sodium is a significant cause of hypertension. Patients and the general public need to be educated to select foods low in sodium (to aim for a sodium intake of less than 100 mmol/day), and the food sector needs to reduce the sodium content of food either voluntarily or by regulation.

Other important recommendations for the management of patients with hypertension include:

- All Canadian adults need to have blood pressure assessed at all appropriate clinical visits. Blood pressure increases with age, such that 50% of Canadians older than 65 years of age have hypertension. For those with normal blood

pressure at 65 years of age, more than 90% develop hypertension within their lifespans. To identify those with hypertension, all adults require ongoing assessment of blood pressure throughout their lives.

- Optimum management requires assessment of overall cardiovascular risk. More than 90% of Canadians with hypertension have other cardiovascular risks. Identifying and managing risk factors beyond hypertension can reduce the overall risk of cardiovascular disease by more than 60% and may alter the blood pressure target (Table 1) and/or alter the specific classes of antihypertensive medications recommended for management (Table 2).
- Lifestyle modifications are effective in reducing blood pressure and cardiovascular risk. Hypertension can be prevented, blood pressure can be reduced, and other cardiovascular risks are favourably impacted by a healthy diet, regular physical activity, moderation in alcohol ingestion, reduction in dietary sodium intake and, in some, reduction of stress (Table 3). Planned but simple and brief health care professional interventions markedly increase the probability of a patient adhering to lifestyle changes. A smoke-free environment is of particular importance to reduce global vascular risk.
- Patients should be treated to the recommended targets to achieve optimal cardiovascular risk reduction. Greater reduction in cardiovascular disease is achieved by lowering the blood pressure to below 140 mmHg (systolic) and 90 mmHg (diastolic) in general, and to below 130 mmHg (systolic) and 80 mmHg (diastolic) if there is chronic kidney disease or diabetes (Table 1). Patients with established cardiovascular disease are recommended for specific blood pressure lowering, even if the pretreatment blood pressure is considered normal (Table 2).
- Combinations of therapies (both drug and lifestyle) are generally necessary to achieve target blood pressure. Most patients require more than one antihypertensive drug or lifestyle changes to achieve recommended blood pressure targets.
- Patients whose blood pressure is above target should be monitored at least every two months. To achieve blood pressure control, follow-up at short intervals is required to both improve patient adherence and increase the intensity of treatment.
- Adherence must be a focus. Nonadherence to therapy is one of the most important challenges to improving blood pressure control. Adherence to therapy should be assessed at each visit, and specific interventions can improve adherence to therapy (Table 4).

TABLE 2
Considerations in the individualization of antihypertensive therapy

	Initial therapy	Second-line therapy	Notes and/or cautions
Hypertension without other compelling indications			
Diastolic ± systolic hypertension	Thiazide diuretics, beta-blockers, ACEIs, ARBs or long-acting calcium channel blockers (consider acetylsalicylic acid and statins in selected patients)	Combinations of first-line drugs	Beta-blockers are not recommended as initial therapy in patients older than 60 years of age. Hypokalemia should be avoided by using potassium-sparing agents in those who are prescribed diuretics as monotherapy. ACEIs are not recommended for black patients. ACEIs and ARBs are teratogenic, and marked caution is required if prescribing to women of child-bearing potential
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			
Diabetes mellitus with nephropathy	ACEIs or ARBs	Addition of thiazide diuretics, cardioselective beta-blockers, long-acting calcium channel blockers or an ARB/ACEI combination	If the serum creatinine level is >150 µmol/L, a loop diuretic should be used as a replacement for a low-dose thiazide diuretic (if volume control is required)
Diabetes mellitus without nephropathy	ACEIs, ARBs, dihydropyridine calcium channel blockers 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 nondihydropyridine calcium channel blockers	Albumin to creatinine ratio <2.0 mg/mmol in men and <2.8 mg/mmol in women
Cardiovascular and cerebrovascular disease			
Angina	Beta-blockers. ACEIs except in low-risk revascularized patients	Long-acting calcium channel blockers	Avoid short-acting nifedipine
Prior myocardial infarction	Beta-blockers and ACEIs (ARBs if ACEI-intolerant)	Long-acting calcium channel blockers	
Heart failure	ACEIs (ARBs if ACEI-intolerant), beta-blockers and spironolactone	ARBs or hydralazine/isosorbide dinitrate (thiazide or loop diuretics as additive therapy)	Avoid nondihydropyridine calcium channel blockers (diltiazem, verapamil). Monitor potassium and renal function if combining an ACEI and an ARB
Left ventricular hypertrophy	ACEIs, ARBs, dihydropyridine calcium channel blockers, diuretics (beta-blockers in patients younger than 55 years)		Avoid hydralazine and minoxidil
Past cerebrovascular accident or TIA	ACEI/diuretic combinations		This does not apply to acute stroke. Blood pressure reduction reduces recurrent cerebrovascular events in patients with previously stable cerebrovascular disease
Nondiabetic chronic kidney disease			
Nondiabetic chronic kidney disease with proteinuria	ACEIs (ARBs if ACEI-intolerant) and diuretics as additive therapy	Combinations of additional agents	Avoid ACEIs or ARBs if bilateral renal artery stenosis or unilateral disease with solitary kidney. Patients placed on an ACEI or an ARB should have their serum creatinine and potassium levels carefully monitored
Renovascular disease	Similar to diastolic ± systolic hypertension without compelling indications for other medications		Avoid ACEIs or ARBs if there is bilateral renal artery stenosis or unilateral disease with solitary kidney
Other conditions			
Peripheral artery disease	Does not affect initial treatment recommendations	Does not affect initial treatment recommendations	Avoid beta-blockers with severe disease
Dyslipidemia	Does not affect initial treatment recommendations	Does not affect initial treatment recommendations	
Global vascular protection	Statin therapy for patients with 3 or more cardiovascular risk factors or with atherosclerotic disease. Low-dose acetylsalicylic acid in patients with controlled blood pressure		Caution should be exercised if blood pressure is not controlled

ACEI Angiotensin-converting enzyme inhibitor; ARB Angiotensin receptor blocker; TIA transient ischemic attack. Reproduced with permission of the Canadian Hypertension Education Program

TABLE 3
Lifestyle therapy to reduce the possibility of becoming hypertensive, and to reduce blood pressure and the risk of blood pressure-related cardiovascular complications in hypertensive patients

- Healthy diet: high in fresh fruits, vegetables, low-fat dairy products, dietary and soluble fibre, whole grains and protein from plant sources, low in saturated fat, cholesterol and salt, in accordance with Canada's Guide to Healthy Eating
- Regular physical activity: accumulation of 30 min to 60 min of moderate-intensity dynamic exercise 4 to 7 days per week
- Low-risk alcohol consumption: ≤ 2 standard drinks/day and less than 14/week for men and less than 9/week for women
- Attaining and maintaining ideal body weight: body mass index of 18.5 kg/m² to 24.9 kg/m²
- Waist circumference of <102 cm for men and <88 cm for women
- Reduction in sodium intake to less than 100 mmol/day
- Smoke-free environment

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NEW 2007 RECOMMENDATIONS AND EVIDENCE

How many adults with high normal blood pressure develop hypertension?

Fifteen per cent of the adult population (3.6 million) is estimated to have high normal blood pressure (130-139/85-89 mmHg). In 2006, a trial was conducted that used pharmacotherapy to 'prevent' hypertension in overweight adults with high normal blood pressure (11). In the placebo-treated participants, 40.4% developed hypertension within two years and 63.0% within four years. The very high risk of developing hypertension in adults with high normal blood pressure was confirmed by the Framingham study (12), in which 37.3% of those 35 to 64 years of age and 49.5% of those older than 65 years of age with high normal blood pressure developed hypertension within four years.

If BP is high normal (130-139 mmHg [systolic] and/or 85-89 mmHg [diastolic]), patients should be followed annually (Grade C).

The CHEP does not endorse labelling those with normal blood pressure as 'prehypertensive' (120/80 mmHg or higher) (13). Studies conducted from the 1970s to date found that persons labelled as hypertensive had a reduced quality of life and increased work absenteeism (14-16). Improvements in quality of life may occur once treatment is successfully introduced (17,18); however, the potential negative and positive impacts of labelling one-half of the adult Canadian population (19) as 'prehypertensive' are unknown.

Should urine microalbumin be routinely assessed in hypertensive patients?

This year, the CHEP Recommendations Task Force considered the recommendation that a urine albumin to creatinine ratio (ACR) be used in selected hypertensive patients to help to define the future risk of cardiovascular events. New evidence was considered from a subgroup analysis of the Losartan Intervention For Endpoint reduction (LIFE) study (20), in which ACR was reported to be an independent predictor of cardiovascular events. However, a number of concerns have been raised regarding the evidence supporting the predictive power of ACR as an atherosclerotic risk factor and the routine monitoring of ACR. For example, assessment of

TABLE 4
Strategies to improve patient adherence

- Assist your patient to adhere by:
 - tailoring pill-taking to fit patients' daily habits;
 - simplifying medication regimens to once-daily dosing;
 - replacing two antihypertensive agents with a fixed-dose combination (when available and appropriate), provided it is the same combination the patient is already taking; and
 - using unit-of-use packaging (of several medications to be taken together).
- Assist your patient in getting more involved in their treatment by:
 - encouraging greater patient responsibility/autonomy in monitoring their blood pressure and adjusting their prescriptions; and
 - educating patients and patients' families about their disease/treatment regimens.
- Improve your management in the office and beyond by:
 - assessing adherence to pharmacological and nonpharmacological therapies at every visit;
 - encouraging adherence with therapy by health care practitioner-based telephone contact, particularly over the first three months of therapy;
 - coordinating with work site health caregivers to improve monitoring of adherence with pharmacological and lifestyle modification prescriptions; and
 - using electronic medication compliance aids.

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albuminuria was based on a single measurement; the largest reduction of urine albumin occurred with a drop in blood pressure; the analysis included a substantial proportion of people with diabetes; and although those whose urine albumin levels fell the most did better, there was no evidence that targeting lower microalbuminuria levels improved outcomes (21,22). The recommendation was withdrawn after being voted against by the majority of respondents in the voting process.

Which is the best diet to prevent hypertension and lower blood pressure in hypertensive patients?

In 2006, the CHEP recommended the Dietary Approach to Stop Hypertension (DASH) type of diet for the prevention and management of hypertension (www.nhlbi.nih.gov/health/public/heart/hbp/dash/new_dash.pdf) (23,24). In 2007, additional evidence became available on the antihypertensive effectiveness of soluble fibre, whole grains and proteins from plant sources (25-27). The PREMIER trial (28) examined lifestyle to prevent and control hypertension. In the PREMIER trial, dietary advice on the DASH eating plan had a less marked reduction in blood pressure than was found in the DASH trials, which provided the diets to the participants (28-30). The reduced effectiveness of dietary advice suggests that nutritional policies and regulations may be more effective than education alone.

It is recommended that hypertensive patients and normotensive individuals at increased risk of developing hypertension consume a diet that emphasizes fruits, vegetables, low-fat dairy products, dietary and soluble fibre, whole grains and protein from plant sources, and one that is reduced in saturated fat and cholesterol (Grade B).

Can hypertension be prevented by sodium restriction?

It is well established that reducing dietary sodium intake reduces blood pressure in hypertensive patients. In 2006, an update to the Cochrane meta-analysis was published (31) that

confirmed reductions in blood pressure in adults with hypertension and normal blood pressure. Furthermore, a 2006 study (32) estimated that up to 17% of hypertension may be attributed to excess dietary sodium. Notwithstanding, it should be noted that there is a lack of strong evidence supporting a decrease in salt intake for reducing hypertension-related cardiovascular complications. In a controlled trial that was methodologically weak (33), there was a marked reduction in cardiovascular events and an increase in survival when one-half of the dietary sodium was replaced with potassium. In contrast, in 2006, a cohort study (34) found that subjects on low-sodium diets had higher rates of cardiovascular disease, which created controversy. The somewhat paradoxical results of this cohort study are likely related to the analytical methods used. The totality of evidence supports the importance of sodium intake as a risk factor in the development of hypertension and cardiovascular disease, as well as sodium restriction in both the prevention and treatment of hypertension. In addition to the CHEP, extensive reviews of the depth and breadth of the literature by highly regarded and unbiased organizations such as the World Health Organization strongly support the reduction of sodium additives to foods on a population-wide basis to prevent and control hypertension (1,35,36).

For the prevention of hypertension, in addition to a well balanced diet, a dietary sodium intake of less than 100 mmol/day is recommended (Grade B).

Do all hypertensive patients require a ‘complete blood count’?

Evidence on the need for screening tests in newly diagnosed hypertensive patients is weak, and the recommendations are largely based on expert opinion. A routine complete blood count was deleted as a recommended screening test in all hypertensive patients this year, largely based on the lack of data supporting its clinical use. Requests for complete blood counts in hypertensive patients should be based on specific clinical indications.

How effective and safe are screening tests for renal artery stenosis in patients with a low glomerular filtration rate?

This year, the CHEP has made a minor modification to the tests recommended for screening for renal artery stenosis. Recent data indicate a low sensitivity of the captopril renogram in those with a glomerular filtration rate of less than 60 mL/min/1.73 m² (37). Furthermore, it has now been recommended that computed tomography angiography should be avoided in persons with chronic kidney disease, in whom contrast-induced nephropathy is a concern.

The following tests are recommended, when available, to aid in the usual screening for renal vascular disease: captopril-enhanced radioisotope renal scan, Doppler sonography, magnetic resonance angiography or computed tomography angiography (for those with normal renal function) (Grade B).

A captopril-enhanced radioisotope renal scan is not recommended for those with chronic kidney disease (glomerular filtration rate of less than 60 mL/min/1.73 m²) (Grade D).

Is combining a diuretic and calcium channel blocker effective in patients who require more than one drug?

This year, the CHEP has recommended the combination of a diuretic and a calcium channel blocker in hypertensive patients who require two drugs and who do not have

comorbidities or compelling reasons for other therapies. This new recommendation adds to the traditional drug combinations (a diuretic or a calcium channel blocker with a beta-blocker, angiotensin-converting enzyme inhibitor or angiotensin receptor blocker). Combinations of diuretics and calcium channel blockers may not have additive hypertensive action when used in combination (38). Nevertheless, a recent large clinical trial that combined a diuretic with a calcium channel blocker produced a similar or greater reduction in blood pressure compared with a diuretic and an angiotensin receptor blocker; more importantly, it had similar or greater reductions in cardiovascular events (39). Furthermore, the Felodipine EVEnt Reduction (FEVER) study (40), which added a calcium channel blocker to a diuretic, demonstrated a large reduction in cardiovascular events compared with a diuretic and standard therapy.

The CHEP continuously strives to reduce the potential for bias in recommendations

The CHEP recommendations are produced and updated by an all-volunteer academic recommendations task force of more than 55 hypertension specialists from across the country. The CHEP was designed to reduce the impact of bias on hypertension management recommendations. The 2007 CHEP process was marked by increased efforts to reduce the potential influence of bias. The CHEP reduces the impact of bias with the following:

- a history of requiring a high level of evidence with patient outcomes for pharmacotherapy recommendations;
- a centralized systematic literature review by a Cochrane group librarian;
- multiple members in subgroups representing different perspectives;
- a central review committee (CRC) that is ‘free of commercial conflicts of interest’ to oversee the evaluation of evidence, development of recommendations and to present the evidence/recommendations;
- a consensus conference chaired by the CRC, with the evidence primarily presented by the CRC;
- written disclosure of potential conflicts of interest at the time of the consensus conference, when the recommendations are discussed;
- voting on recommendations, with the removal of recommendations voted against by 30% or more of members; and
- annual hypertension management themes, key messages and major implementation tools developed through a consensus of the full CHEP Executive – other internal implementation tools require the consensus of two members of the executive.

The CHEP Executive prioritized minimizing the potential impact of bias at a retreat in May 2006. The CHEP strives to produce the highest quality current hypertension recommendations. As a result of the retreat, it was decided that all implementation tools produced by organizations other than the CHEP must be completely consistent with the content and intent of the CHEP recommendations, and that they require the uniform agreement of three members of the CHEP Executive to be endorsed.

Additional comments and new directions

In 2007, there have been relatively few changes to the CHEP recommendations compared with previous years, likely because there were not many major clinical trials that finished in 2006. Nevertheless, the CHEP appreciates that additional new evidence will have significant impact on hypertension management. In 2006, a study (41) found that the American hypertension recommendations did have significant impacts on hypertension management; however, the impact diminished significantly one year after the release. The CHEP believes that this supports the need for maintaining annual updates to provide practitioners with current recommendations. The marked and sustained changes in hypertension diagnosis and treatment in Canada after the initiation of the CHEP support this belief (5,42,43).

Improving the outcomes of Canadians with, or at risk for, hypertension requires a comprehensive program. Strong data support the benefits of multidisciplinary care in chronic disease (risk) management, and the CHEP is leading an effort to enhance physician, nursing and pharmacy education in the management of hypertensive patients (44-46). In addition, greater patient involvement in care enhances blood pressure control, and the CHEP is developing tools to support enhanced patient self-care (46-48). Community interventions can be successful and can have a large impact on patient outcomes, especially those that result in more systematic care (44,49). A new initiative led by Blood Pressure Canada is developing a network of community-based programs across Canada to discuss and foster best practices, and ultimately to aid the dissemination of these programs across Canada. An educated public is also essential to the prevention and early diagnosis of hypertension (48). The CHEP is aiding Blood Pressure Canada and other partners in developing a sustained, evidence-based public education program. In addition, hypertension management should be integrated with other cardiovascular risks and disease management programs. Progress on this front has been slow; however, the recent federal government announcement of a national heart health strategy is likely to accelerate this process. Last, it is critical that our governments act to support Canadians living healthy lives. From the hypertension perspective, policies and regulations must result in environments that support Canadians choosing appropriate nutrition and activity levels.

In 2007, results from a Heart and Stroke Foundation survey will indicate the prevalence, awareness, treatment and control rates of hypertension in Ontario. This survey will provide an indication of our progress and which further initiatives are required. The results of a national survey are expected in 2009. The CHEP will strive toward Canada having the world's lowest prevalence of hypertension, as well as optimal rates of hypertension awareness, treatment and control. The CHEP is aided by strong collaborations with its sponsors: the

Public Health Agency of Canada, The Canadian Hypertension Society, Blood Pressure Canada, the Heart and Stroke Foundation of Canada, the Canadian Council of Cardiovascular Nurses, the Canadian Pharmacists Association and The College of Family Physicians of Canada.

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NOTE: 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 may be obtained by contacting Megan Smith, Blood Pressure Canada coordinator, at hyperten@ucalgary.ca.

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