2007 Recommendations of the Canadian Hypertension Education Program: Short Clinical Summary (Annual Update)

On behalf of the Canadian Hypertension Education Program

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 http://www.hypertension.ca and http://www.heartandstroke.ca. Bulk orders of 25 or more copies can be obtained by contacting Megan Smith, Blood Pressure Canada coordinator, at hyperten@ucalgary.ca

INTRODUCTION

The year 2007 marks the eighth consecutive year that the Canadian Hypertension Education Program 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 regularly assess blood pressure in those with high normal values. In addition, the 2007 recommendations support the increasing evidence that hypertension can be prevented through public health interventions to reduce dietary sodium.

NEW KEY MESSAGES

Two new key messages are identified in the 2007 recommendations:

- Blood pressure should be assessed annually for adults with high normal blood pressure. One in 5 adult Canadians has high normal blood pressure (systolic 130–139 mm Hg, diastolic 85–89 mm Hg). Of those who are overweight and have high normal blood pressure, 40% will develop hypertension within 2 years and 60% will develop hypertension within 4 years. Therefore, annual or more frequent assessment of blood pressure and appropriate lifestyle interventions to prevent hypertension are recommended for those with high normal blood pressure.
- Canadians should reduce sodium in the diet. Excess dietary sodium is a significant cause of hypertension. Patients and the general public need to be educated to select foods low in sodium (aiming 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 the patient with hypertension:

- All Canadian adults should have blood pressure assessed at all appropriate clinical visits. Blood pressure increases with age, and 50% of Canadians over 65 years of age have hypertension. For those with normal blood pressure at 65 years of age, over 90% will develop hypertension within their lifespan. To identify those with hypertension, all adults must have assessment of blood pressure throughout their lives.
- Optimum management requires assessment of overall cardiovascular risk. Over 90% of Canadians

with hypertension have other cardiovascular risks. Identifying and managing risk factors other than hypertension can reduce the overall risk of cardiovascular disease by over 60% and can alter the blood pressure target (Table 1) and specific classes of antihypertensive medications recommended (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 favorably affected by a healthy diet, regular physical activity, moderation in alcohol, reductions in dietary sodium, and (for some) stress reduction (Table 3). Simple and brief interventions by health care professionals markedly increase the chance that a patient will adhere to lifestyle changes.
- To achieve optimum reduction of cardiovascular risk, treat patients to the recommended targets. Greater reduction in cardiovascular disease is achieved by lowering the blood pressure to the stated targets (Table 1).

Table 1. Target Values for Blood Pressure*

Condition	Target Blood Pressure (mm Hg)
Diastolic ± systolic hypertension	< 140/90
Isolated systolic hypertension	< 140 systolic
Diabetes	< 130/80
Chronic kidney disease	< 130/80

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*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.

Table 2. Considerations in the Individualization of Antihypertensive Therapy

Condition	Initial Therapy	Second-line Therapy	Notes and/or Cautions
Hypertension without other compelling indications			
Diastolic ± systolic hypertension	Thiazide diuretics, ß-blockers, ACE inhibitors, ARBs, or long-acting calcium-channel blockers (consider ASA and statins in selected patients)	Combinations of first-line drugs	ß-Blockers are not recommended as initial therapy for those > 60 years of age. Hypokalemia should be avoided by using potassium-sparing agents in those for whom diuretics are prescribed as monotherapy. ACE inhibitors are not recommended for black patients. ACE inhibitors and ARBs are teratogenic; marked caution is required if prescribing to women of child-bearing potential.
Isolated systolic hypertension	Thiazide diuretics, ARBs, or long-acting dihydropyridine calcium-channel blockers	Combinations of first-line drugs	Same notes apply as for diastolic ± systolic hypertension.
Diabetes mellitus			
With nephropathy	ACE inhibitors or ARBs	Addition of thiazide diuretics, cardioselective ß-blockers, long-acting calcium-channel blockers, or a combination of ARB and ACE inhibitor	If the serum creatinine level is >150 µmol/L and volume control is required, use a loop diuretic as a replacement for low-dose thiazide diuretics.
Without nephropathy	ACE inhibitors, ARBs, dihydropyridine calcium-channel blockers, or thiazide diuretics	Combination of first-line drugs; if first-line agents are not tolerated, add cardioselective ß-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

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ACE = angiotensin-converting enzyme, ASA = acetylsalicylic acid, TIA = transient ischemic attack, ARB = angiotensin II receptor blocker.

Table 2. (continued)

Condition	Initial Therapy	Second-line Therapy	Notes and/or Cautions
Cardiovascular and cerebrovascular disease			
Angina	ß-Blockers and ACE inhibitors, except in low-risk revascularized patients	Long-acting calcium-channel blockers	Avoid short-acting nifedipine
Prior myocardial infarction	ß-Blockers and ACE inhibitors (ARBs for patients with intolerance to ACE inhibitors)	Long-acting calcium-channel blockers	
Heart failure	ACE inhibitors (ARBs for patients with intolerance to ACE inhibitors), ß-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 ACE inhibitor and an ARB.
Left ventricular hypertrophy	ACE inhibitors, ARBs, dihydropyridine calcium-channel blockers, diuretics (ß-blockers for patients < 55 years of age)		Avoid hydralazine and minoxidil.
Past cerebrovascular accident or TIA	Combinations of ACE inhibitor and diuretic		This does not apply to patients with acute stroke. Blood pressure reduction reduces recurrence of cerebrovascular events in patients with stable past cerebrovascular disease.
Nondiabetic chronic kidney disease			
With proteinuria	ACE inhibitors (ARBs for patients with intolerance to ACE inhibitors); diuretics as additive therapy	Combinations of additional agents	Avoid ACE inhibitors and ARBs if patient has bilateral renal artery stenosis or unilateral disease with solitary kidney. Serum creatinine and potassium should be carefully monitored for patients taking ACE inhibitor or ARB.
Renovascular disease	Similar to diastolic ± systolic hypertension without compelling indications for other medications		Avoid ACE inhibitors and ARBs for patients with bilateral renal artery stenosis or unilateral disease with solitary kidney.
Other conditions			
Peripheral arterial disease	Does not affect initial treatment recommendations	Does not affect initial treatment recommendations	Avoid ß-blockers if disease is severe.
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 ASA for patients with controlled blood pressure		Caution should be exercised if blood pressure is not controlled.

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Table 3. Lifestyle Therapy to Reduce the Possibility of Becoming Hypertensive, Reduce Blood Pressure, and Reduce the Risk of Blood-Pressure-Related Cardiovascular Complications in Hypertensive Patients

Therapeutic Strategy	Definition and Comments
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 to 60 min of moderate-intensity dynamic exercise 4 to 7 days per week
Low-risk alcohol consumption	No more than 2 standard drinks per day for both men and women Weekly total of fewer than 14 drinks for men and fewer than 9 drinks for women
Achieve and maintain ideal body weight	Body mass index 18.5 to 24.9 kg/m^2 Waist circumference < 102 cm for men and < 88 cm for women
Reduce sodium intake	< 100 mmol/day
Reduce exposure to smoke	Smoke-free environment

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- Combinations of therapies (both drug and lifestyle) are generally necessary to achieve target blood pressure. Most patients require more than one antihypertensive drug and lifestyle changes to achieve recommended blood pressure targets. When using 2 drugs to lower blood pressure, combinations of ß-blocker, angiotensin-converting enzyme inhibitor, and angiotensin receptor blocker produce less than additive hypotensive effect.
- For patients whose blood pressure is above target, blood pressure should be monitored at least every 2 months. To achieve blood pressure control, follow-up at short intervals is required both to improve patient adherence and to increase the intensity of treatment.
- Focus on adherence. Nonadherence to therapy is one of the most important challenges in improving blood pressure control. Adherence to therapy should be assessed at each visit. Specific interventions can improve adherence to therapy (Table 4).

Table 4. Strategies to Improve Adherence

Adherence can be improved by a multipronged approach:

- Assess adherence to pharmacologic and nonpharmacologic therapy at every visit
- Simplify medication regimens using once-daily dosing of long-acting medications, combination tablets, and medication compliance aids
- Tailor pill-taking to fit patients' daily habits
- Encourage greater patient responsibility by encouraging monitoring of blood pressure at home
- Coordinate with chronic disease management programs to improve monitoring of adherence with pharmacologic and lifestyle modification prescriptions
- Educate patients and patients' families about hypertension and its treatment

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