

2004 CHEP Hypertension Recommendations

What's New, What's Old But Still Important in 2004

The Canadian Hypertension Education Program recently updated its recommendations for the management of hypertension. Dr. Campbell provides a summary of the key points.

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The World Health Organization (WHO) estimates that high blood pressure is the leading risk for death in women, and the second leading risk in men in developed countries like Canada.¹ Likewise, hypertension is also the number one risk factor for both stroke and congestive heart failure.^{1,2} It is estimated that 50% of cardiovascular disease is attributable to high blood pressure.¹ Even those who are normotensive in middle age are at higher risk for developing hypertension. Estimates show that 90% of people who have normal blood pressure at age 55 will develop hypertension prior to death.³ While the complications of hypertension are preventable, it is most worrisome that over 40% of those with hypertension are unaware they have the disease and only 13% are treated to current recommended targets.⁴

The Canadian Hypertension Education Program (CHEP) was formed in 1999 in response to the challenge of controlling hypertension and hypertension-related cardiovascular disease. A coalition

of health-care professional societies, which have a stake in the management of hypertension, supported the initiative, including:

- The Canadian Hypertension Society,
- The Canadian Coalition for High Blood Pressure Prevention and Control,
- The College of Family Physicians of Canada,
- Health Canada, and
- The Heart and Stroke Foundation of Canada.⁵

Table 1

Impact of lifestyle therapies on BP in hypertensive patients

Intervention	Targeted change	Systolic BP/ Diastolic BP
Sodium reduction	100 mmol/day	-5.8/-2.5 mmHg
Weight loss	4.5 kg	-7.2/-5.9 mmHg
Alcohol reduction	2.7 drinks/day	-4.6/-2.3 mmHg
Exercise	3 times/week	-10.3/-7.5 mmHg
Dietary patterns	DASH diet	-11.4/-5.5 mmHg

BP: Blood pressure

DASH: Dietary approach to stop hypertension

Table 1

Impact of lifestyle therapies on BP in hypertensive patients

Food group	Daily serving	Example
Grains	7-8	Whole wheat, oatmeal products
Vegetables	4-5	Tomatoes, potatoes, carrots, beans, peas
Fruits	4-5	Oranges, apples, bananas
Low-fat dairy products	2-3	Low-fat milk (1%) or yogurt
Meats, poultry, fish	≤ 2	Lean meats; trim away visible fat and skin; avoid frying
Nuts, seeds, dried beans	4-5/week	Almonds, peanuts, lentils
Fats and oils	2-3	Soft margarine, vegetable oils
Sweets	5/week	Hard candy, sugar

The CHEP's mandate is to annually update evidence-based hypertension management recommendations and provide tools to assist health-care professionals adopt and implement these recommendations.^{5,6} This executive summary will provide both an overview of the important and new aspects of the 2004 hypertension management recommendations, and advice on the implementation of the recommendations. Other implementation tools, including a health-care professional and public education power point slide kit, are available through the Canadian Hypertension Society Web site (www.chs.md), or a number of annually revised Continuing Medical Education Programs. Printed forms of the recommendations are available in a variety of formats, rang-

ing from pocket cards to single-page summaries or textbooks.

What's new for 2004?

1. Taking a broader approach to prevent atherosclerotic disease

There is an increasing appreciation that blood pressure control must be viewed as only one component of a holistic approach to the care of patients with hypertension. Over 90% of h y p e r t e n s i v e

Canadians have other cardiovascular risk factors. While lowering blood pressure reduces the relative risk of major cardiovascular complications by 21% to 30%,⁷ a comprehensive pharmacologic approach to reducing cardiovascular risk is estimated to lower risk by 80%.⁸ There would be additional risk-lowering effects from lifestyle modification. As a result, the 2004 recommendations broaden the vascular protection strategy for patients with hypertension to include the consideration of prescribing statins and acetylsalicylic acid (ASA). Further, angiotensin-converting enzyme (ACE) inhibitors are recommended for all patients with established atherosclerotic disease.⁹

2. Increasing recognition of the need for lifestyle modification

Most Canadians have a very high probability of developing hypertension. Further, there is a growing consensus that, in appropriately selected patients, single interventions to modify lifestyle can be as effective as a full dose of an antihypertensive medication (Table 1).¹⁰ A critical recommendation involves advocating lifestyle modifications, which can prevent hypertension and have substantial blood pressure-lowering effects for normotensive adult Canadians.¹⁰ Furthermore, lifestyle modifications are important both as initial hypertension management and in conjunction with pharmacologic therapy. Different lifestyle interventions can be combined to further reduce blood pressure.

Moderate, dynamic physical activity (30 to 45 minutes most days of the week) is effective in reducing blood pressure in hypertensive patients and in the general normotensive population. Regular physical exercise has a similar average reduction in blood pressure compared to a standard antihypertensive medication.¹⁰

Minor elevations in body mass index are recognized to have detrimental effects on blood pressure control. In those who are overweight, blood pressure is reduced by approximately 2/1 mmHg for every 1 kg of weight loss.¹⁰

The adverse effects of excessive alcohol intake need to be re-emphasized to those who choose to drink alcohol, as an estimated 8% of hypertension in males is attributable to this

cause. A reduction in alcohol consumption to less than two drinks per day and no more than 14 drinks weekly for males (or no more than nine drinks weekly for females) will reduce blood pressure in both normotensive and hypertensive persons who drink more heavily.¹⁰

Patients with hypertension or those who want to prevent hypertension should be informed of the benefits a dietary approach to stop hypertension (DASH)-type diet has on blood pressure control. The DASH diet—which is high in fresh fruit and vegetables, nuts, legumes, and low-fat dairy products—is low in saturated fat (Table 2). Even in the absence of weight loss, the DASH diet reduces blood pressure to a similar extent as a single antihypertensive medication.^{10,11} An additional effect is salt restriction in hypertensive and salt-sensitive normotensive patients (*i.e.*, Canadians of African descent, those over age 45, and individuals with impaired renal function or diabetes).^{10,12}

The difficulty of implementing lifestyle change is appreciated given the factors in our society that discourage physical activity and

Table 3

Blood pressure treatment targets

Situation	Blood pressure target	
	Systolic	Diastolic
Without compelling indication for more intense treatment	< 140 mmHg	< 90 mmHg
Isolated systolic hypertension	< 140 mmHg	
Diabetes	< 130 mmHg	< 80 mmHg
Renal disease	< 130 mmHg	< 80 mmHg
Renal disease with > 1g/24 hours proteinuria	< 125 mmHg	< 75 mmHg

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Table 4

Considerations in the individualization of antihypertensive therapy

	Initial therapy	Second-line therapy	Notes and/or cautions
Uncomplicated hypertension with no other compelling indication	Thiazide diuretics, beta blockers, ACE inhibitors, ARBs, or long-acting DHP CCBs	Combination of first-line drugs (see Table 5)	Alpha blockers are not recommended as initial therapy. Beta blockers are not recommended as initial therapy in those over 60. Hypokalemia should be avoided by using potassium-sparing agents in those who are prescribed diuretics. ACE inhibitors are not recommended as monotherapy in black patients.
Isolated systolic hypertension with no other compelling indication	Thiazide diuretics, ARBs, or long-acting DHP CCBs	Combination of first-line drugs	Hypokalemia should be avoided by using potassium-sparing agents in people who are prescribed diuretics.
Diabetes mellitus with nephropathy	ACE inhibitors or ARBs	Addition of one or more of thiazide diuretics, cardioselective beta blockers, long-acting CCBs, or an ARB/ACE inhibitor combination	
Diabetes mellitus without nephropathy	ACE inhibitors, ARBs, or thiazide diuretics	Combination of first-line drugs or addition of cardioselective beta blockers and/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 thiazide diuretics if volume control is required.
Diabetes mellitus without nephropathy, with systolic hypertension	1. ACE inhibitor or ARBs 2. Thiazide diuretics or long-acting DHP CCBs		
Angina	Beta blockers and ACE inhibitors	Long-acting CCBs	Avoid short-acting nifedipine.
Prior myocardial infarction	Beta blockers and ACE inhibitors	Combination of additional agents	
Heart failure	ACE inhibitors (thiazide or loop diuretics, beta blockers, spironolactone as additive therapy)	ARBs or hydralazine/isosorbide dinitrate	Avoid non-DHP CCBs (diltiazem, verapamil).
Past cerebrovascular accident or TIA	ACE inhibitor/diuretic combination		BP reduction reduces recurrent cerebrovascular events.
Renal disease	ACE inhibitors (diuretics as additive therapy)	Combination of additional agents	Avoid ACE inhibitors if bilateral renal artery stenosis.
Left ventricular hypertrophy	ACE inhibitors, ARBs, DHP CCBs, diuretics (beta blockers for patients under 55)		Avoid hydralazine and minoxidil.
Peripheral arterial disease	Same as hypertension with no other compelling indication	Same as hypertension with no other compelling indication	Avoid beta blockers with severe disease.
Dyslipidemia	Same as hypertension with no other compelling indication	Same as hypertension with no other compelling indication	

ACE: Angiotensin-converting enzyme
CCB: Calcium channel blocker
BP: Blood pressure

ARB: Angiotensin receptor blocker
ASA: Acetylsalicylic acid

DHP: Dihydropyridine
TIA: Transient ischemic attack

Table 5

Useful antihypertensive drug combinations

Column 1

Thiazide diuretic

Long-acting dihydropyridine calcium channel blocker

For additive hypotensive effect in dual therapy, combine an agent from Column 1 with any in Column 2.

Column 2

Beta blocker

Angiotensin-converting enzyme inhibitor

Angiotensin receptor blocker

healthy eating. Notwithstanding, even brief intervention by the physician increases the probability of a patient adhering to some lifestyle changes.¹³⁻¹⁷ Multidisciplinary, comprehensive approaches are most successful. It is useful to involve the entire family in this process, as any substantive and successful changes will invariably involve and directly affect the family, as well as the individual. However, it must be recognized that our environment largely determines lifestyle. Thus, health-care professionals, volunteer organizations, all levels of government, communities, and the health-care and food industries all need to advocate for change in order to develop policies, create infrastructure, and provide resources to support healthy lifestyles.

What's old, but still important in 2004?

1. Assess blood pressure in all adult patients

All adult patients should have their blood pressure assessed at every appropriate opportunity,

and be informed of the measurement's significance.¹⁸ Because of the high risk of developing hypertension over time, those with normal readings should still receive lifestyle advice and be counseled to have followup blood pressure readings throughout their life. Those with initial hypertensive readings require repeat measurement over three to five visits unless there is severe hypertension, a hypertensive urgency, or emergency dictating the need for more rapid therapy. Patients with uncomplicated hypertension, without target organ damage, and blood pressures between 140-159/90-99 mmHg at visit three, should have two further visits prior to being diagnosed with hypertension. Self-measurement and 24-hour ambulatory measurement continue to be recommended for consideration in assessing office-induced blood pressure elevation and the former is also recommended to improve patient compliance. Only devices meeting international standards should be used. Daytime blood pressures > 135/85 mmHg with ambulatory and self-measurement are consistent with hypertension.

2. Routine laboratory assessments should be part of the workup

Routine laboratory assessment, including blood for electrolytes, creatinine, fasting glucose, complete blood count, lipid profile (total cholesterol, high-density lipoprotein [HDL] cholesterol, low-density lipoprotein [LDL] cholesterol, and triglycerides), urinalysis, and electrocardiogram, should be performed when hypertension is diagnosed. If secondary forms of hypertension are suspected, based on history or initial laboratory assessment, more detailed investigations are recommended.¹⁸

Table 6

Recommendations to improve adherence to antihypertensive prescriptions

Adherence can be improved by a multipronged approach:

1. Assess adherence level at each visit.
2. Educate patients and patients' families about hypertension/treatment regimens.
3. Engage the family in lifestyle changes.
4. Simplify medication regimens to once daily dosing.
5. Tailor pill-taking to fit patients' daily habits.
6. Encourage greater patient responsibility/autonomy in monitoring their blood pressure and adjusting their prescriptions.

3. Hypertension treatment should be based on considerations of global cardiovascular risk and a more holistic approach to hypertensive patients

Patients with hypertension and three or more of the following cardiovascular risks:

- male,
- age over 55,
- smoking,
- diabetes,
- total cholesterol to HDL ratio ≥ 6 ,
- microalbuminuria or proteinuria,
- left ventricular hypertrophy,
- peripheral vascular disease,
- past cerebrovascular or coronary artery disease, or
- family history of premature cardiovascular disease

should be treated with a statin in addition to their blood pressure-lowering therapy. All

patients 50 and over, with hypertension, should also be prescribed ASA once their blood pressure is controlled, unless there are contraindications. Those with dyslipidemia and diabetes require the more aggressive treatment outlined in the recently updated Canadian Lipid and Diabetes Recommendations.^{19,20} As noted earlier, all patients with clinically overt atherosclerotic disease should be prescribed an ACE inhibitor.

4. Treat to target


The treatment and control of blood pressure in Canada is markedly worse than in the U.S.⁴ Only a small percentage of Canadians who have hypertension are treated to the recommended targets (Table 3). In particular, health-care professionals often disregard systolic blood pressure readings above target. Current evidence more strongly associates adverse cardiovascular outcomes with systolic blood pressure than with diastolic blood pressure. The benefits of more aggressively lowering blood pressure to current targets are particularly strong in those with renal disease and proteinuria or with diabetes. For patients without other compelling indications, first-line therapy choices include thiazide diuretics, beta blockers, ACE inhibitors, and angiotensin receptor blockers. Table 4 provides current recommendations for individualization of antihypertensive therapy based on patient characteristics.

5. Using antihypertensive therapy combinations

It is critical to combine lifestyle and pharmacologic treatments. Diuretics are an important

option as first-line therapy and should be included in most combination therapies. The vast majority of hypertensive patients will require two or more drugs in combination to achieve recommended blood pressure targets. The average reduction in blood pressure is about 10 mmHg systolic and 5 mmHg diastolic for a single antihypertensive drug. The most effective combinations are outlined in Table 5. Because a substantial proportion of hypertensive individuals will require three or more drugs to achieve blood pressure targets, primary health-care practitioners need to become comfortable with prescribing three antihypertensive drug regimens. Consider non-adherence, secondary hypertension, interfering drugs, lifestyles, and/or office induced increases in blood pressure (white coat effect) for patients who have little response to appropriate therapy.

6. Promoting patient adherence

Establishing and maintaining patient adherence to their antihypertensive management prescription remains a major issue. Approximately 50% of newly treated hypertensive patients discontinue antihypertensive therapy within one to two years after initiation.²¹ However, attention to some simple approaches can prevent patient non-adherence (Table 6). Since non-adherence to therapy is a common barrier to most diseases, health-care professionals should become familiar with approaches to prevent non-adherence, to detect non-adherence, and to improve adherence in those who have difficulty following the therapeutic regimen.⁹ 

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A slide kit for medical education can be downloaded from the Canadian Hypertension Society Web site at: www.chs.md