



2008 CHEP Recommendations: An Annual Update

On behalf of the Canadian Hypertension Education Program (CHEP)

The year 2008 marks the ninth consecutive year that the Canadian Hypertension Education Program (CHEP) has updated recommendations for the management of hypertension. This year, CHEP focused on the healthcare professional's role in encouraging appropriate patients to measure their BP at home properly.

The 2008 CHEP theme: Home measurement of BP

Measuring BP at home has a stronger association with CV prognosis than do office-based readings.

Home measurement can:

- confirm the diagnosis of hypertension,
- improve BP control,
- reduce the need for medications in some,
- help identify white coat and masked hypertension and
- improve medication adherence in non-adherent patients.

Healthcare professionals can encourage appropriate patients to assess their BP properly at home. Brief patient instructions are in Table 1a and Figure 1. Patient instructions for purchasing and using home BP measurement can be found at www.hypertension.ca and www.heartandstroke.ca/BP. The latter site's e-health tool, the BP Action Plan (BPAP) has an interactive self management portal ("My Health on Track") that provides a mechanism for recording and monitoring BPs, medications and lifestyle changes and

Table 1a

Patient instructions to prepare 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
- Read and follow the manufacturer's directions
- Check the accuracy of the machine with a healthcare provider to make sure it is accurate

Reprinted with permission from Blood Pressure Canada

encourages positive steps towards better BP management. General sources for patient information on hypertension can be found in Table 2.

Other important hypertension management recommendations

BP assessment for adults

All Canadian adults need to have their BP assessed at all appropriate clinical visits. BP increases with age such that 50% of Canadians > 65-years-of-age have hypertension. For those with normal BP at age 55, > 90% will develop hypertension within an average lifespan. To identify those with hypertension, all adults require ongoing assessment of BP throughout their lives and those with high normal BP require annual assessment.



Table 1b

Patient instructions to prepare for home BP measurement

To measure BP

- Follow the directions that come with the device
- Only measure and record BP if you have time to do it correctly
- It is very important to rest and relax for 5 minutes in a quiet comfortable place with no distractions (e.g., TV or talking) before measuring your BP
- Wait for at least 2 hours after a big meal and at least a half hour after drinking coffee or smoking
- Empty your bladder or bowels if it is uncomfortable before taking a reading
- Put the cuff on a bare arm
- Do not measure BP when you are uncomfortable, cold, anxious, stressed or in pain
- 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 medications and 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

Reprinted with permission from Blood Pressure Canada



Figure 1. Patient diagram of proper BP measurement.

Assessing other CV risks

Optimum management requires the additional assessment for other CV risks, such as:

- smoking,
- sedentary behaviour,
- unhealthy eating,
- dyslipidemia and
- diabetes.

Over 90% of Canadians with hypertension have other CV risks. Identifying and managing risk factors beyond hypertension can reduce the overall risk of CVD by > 60% and can alter the BP target (Table 3) and specific classes of antihypertensive medications recommended (Tables 4a and 4b) to hypertensive patients.

Measuring BP at home has a stronger association with CV prognosis than do office-based readings.

Lifestyle modifications

Lifestyle modifications are effective in reducing BP and CV risk. Hypertension can be prevented, BP can be reduced and other CV risks are favourably impacted by:

- a healthy diet,
- regular physical activity,
- moderation in alcohol,
- reductions in dietary sodium and, in some,
- stress reduction (Table 5).

Table 6 provides tips that can be used to advise patients on how to reduce dietary sodium.

Simple and brief healthcare professional interventions markedly increase the probability of a patient adhering to lifestyle changes. A section of



Table 2
Internet resources for patient information*

Resource	Description	Source
2008 Public Hypertension Recommendations	General information on prevention and treatment of hypertension	www.hypertension.ca www.heartandstroke.ca
Online, personalized BP plan	Create a personalized action plan for healthy living	www.heartandstroke.ca/bp
Dietary Approaches to Stop Hypertension (DASH) diet	The DASH diet and healthy eating to improve BP 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
Online health and fitness calculators	Learn about your risk factors using different tools to calculate your personal factors	www.healthtoolsonline.com/health-fit.html
Diabetes and hypertension	Information on hypertension for people with diabetes	www.diabetes.ca
Heart Disease and Stroke	Controlling your BP can reduce your chance of developing heart disease or having a stroke	www.heartandstroke.ca

* Many of the resources can be downloaded and printed, or hard copies can be ordered for patients who do not use the Internet. (Reprinted with permission from Blood Pressure Canada)

the Heart and Stroke Foundation website (www.heartandstroke.ca/BP) has been designed to assess a hypertensive patient's lifestyle and provides individualized approaches and monitoring to assist with lifestyle changes.

Treat to recommended targets

Treat patients to the recommended targets to achieve optimum CV risk reduction. A greater reduction in CVD is achieved by lowering the BP to the stated targets.

Combining therapies

Combination therapy (both drug and lifestyle) are generally necessary to achieve targeted BP. Most patients require more than one antihypertensive

Table 3
Target values for BP

Setting	Target (SBP/DBP)
Home Home BP/daytime ABPM*	< 135/85 mmHg
Office	
• Diastolic with/without systolic hypertension	< 140/90 mmHg
• Isolated systolic hypertension	< 140 mmHg
• Diabetes	< 130/80 mmHg
• Chronic kidney disease	< 130/80 mmHg

SBP: Systolic BP DBP: Diastolic BP ABPM: Ambulatory BP 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 CHEP)



2008 CHEP Recommendations

Table 4a

Considerations in the individualization of antihypertensive therapy*

Hypertension without other compelling indications		Target < 140/90 mmHg	
	Initial therapy	Second-line therapy	Notes and/or cautions
Diastolic with/without systolic hypertension	Thiazide diuretics, β -blockers, ACE inhibitors, ARBs, or long-acting calcium channel blockers (CCBs) (consider ASA and statins in selected patients). Consider initiating therapy with a combination of 2 first-line drugs if BP is ≥ 20 mmHg systolic or ≥ 10 mmHg diastolic above target	Combinations of first-line drugs	β -blockers are not recommended as initial therapy in those aged > 60 years. Hypokalemia should be avoided by using potassium-sparing agents in those prescribed diuretics as monotherapy. ACE inhibitors are not recommended in African Americans. ACE inhibitors and ARBs are teratogenic; caution is required if prescribing to women of childbearing potential
Isolated systolic hypertension without other compelling indications	Thiazide diuretics, ARBs or long-acting dihydropyridine CCBs.	Combinations of first-line drugs	Same as diastolic with/without systolic hypertension
Diabetes mellitus		Target < 130/80 mmHg	
	Initial therapy	Second-line therapy	Notes and/or cautions
Diabetes mellitus with nephropathy	ACE inhibitors or ARBs	Addition of thiazide diuretics, cardioselective β -blockers, long-acting CCBs or use an ARB/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 first-line agents are not tolerated, then add cardioselective β -blockers and/or long-acting nondihydropyridine CCBs	Normal albumin to creatinine ratio < 2.0 mg/mmol in men and < 2.8 mg/mmol in women
Non-diabetic chronic kidney disease		Target < 130/80 mmHg	
	Initial therapy	Second-line therapy	Notes and/or cautions
Non diabetic chronic kidney disease with proteinuria	ACE inhibitors (ARBs if ACE inhibitor-intolerant) diuretics as additive therapy	Combinations of additional agents	Avoid ACE inhibitors or ARBs if bilateral renal artery stenosis or unilateral disease with solitary kidney. Patients placed on an ACE inhibitor or an ARB should have their serum creatinine and potassium carefully monitored
Renovascular disease	Similar to diastolic with/without systolic hypertension without compelling indications for other medications	—	Avoid ACE inhibitors or ARBs if bilateral renal artery stenosis or unilateral disease with solitary kidney. Patients placed on an ACE inhibitor or an ARB should have their serum creatinine and potassium carefully monitored



Table 4b

Considerations in the individualization of antihypertensive therapy*

CV and cerebrovascular disease		Target < 140/90 mmHg	
	Initial therapy	Second-line therapy	Notes and/or cautions
Angina	β-blockers and ACE inhibitors, except in low-risk patients	Long-acting CCBs	Avoid short-acting nifedipine
Prior MI	β-blockers and ACE inhibitors (ARBs if ACE inhibitor-intolerant)	Long-acting CCBs	—
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 nondihydropyridine CCBs (diltiazem, verapamil). Monitor potassium and renal function if combining and ACE inhibitor and ARB
Left ventricular hypertrophy	ACE inhibitors, ARBs, dihydropyridine CCB, diuretics, (β-blockers for patients aged < 55 years)	—	Avoid hydralazine and minoxidil
Past cerebrovascular accident or TIA	ACE inhibitor/diuretic combinations	—	This does not apply to acute stroke. BP reduction lowers recurrent cerebrovascular events in patients with stable past cerebrovascular disease. BP lowering should be considered in those with normal BP who have had a stroke
Other conditions		Target < 140/90 mmHg	
	Initial therapy	Second-line therapy	Notes and/or cautions
Peripheral arterial disease	Does not affect initial treatment recommendations	Does not affect initial treatment recommendations	Avoid β-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 CV risk factors or with atherosclerotic disease. Low dose ASA in patients with controlled BP	—	Caution should be exercised if BP is not controlled

NYHA: New York Heart Association

TIA: Transient ischemic attack

Reprinted with permission from the CHEP

Acknowledgement

This manuscript was written by Dr. N. Campbell with the assistance of the CHEP Executive, Dr D. W. McKay and Dr. G. Tremblay.



Table 5

Lifestyle therapy to reduce BP, the possibility of becoming hypertensive and the risk of BP-related CV 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 30-60 minutes of moderate intensity dynamic exercise 4-7 days/week in addition to daily activities
- **Low-risk alcohol consumption:**
2 standard drinks q.d. and < 14/week for men and < 9/week for women
- **Attaining and maintaining ideal body weight:**
BMI: 18.5-24.9 kg/m²
- **Waist circumference:**
< 102 cm for men and < 88 cm for women
- **Reduction in sodium intake:**
< 2,300 mg q.d.
- A smoke free environment

*Reprinted with permission from the CHEP

drug and lifestyle change to achieve recommended BP targets. When using two drugs to lower BP, combinations of a β -blocker, ACE inhibitor or ARB produce less than additive hypotensive effects. If BP is $\geq 20/10$ mmHg above target, initiating therapy with a combination of two first-line antihypertensive drugs is a first-line option.

Monitoring BP

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

BP increases with age such that 50% of Canadians > 65-years-of-age have hypertension.

Focus on adherence

Non-adherence to therapy is one of the most important challenges to improving BP control. Adherence to therapy should be assessed at each visit. Some specific interventions (approved by the CHEP) to improve adherence to therapy include:

- Simplifying medication regimens using once daily dosing of long-acting medications, combination tablets and utilizing medication compliance aids
- Tailor pill-taking to fit patients' daily habits
- Encourage greater patient responsibility by encouraging monitoring home BP
- Coordinate with chronic disease management programs (if available) to improve monitoring of adherence with pharmacological and lifestyle modification prescriptions
- Educate patients and patients' families about hypertension and its treatment

Comments from the CHEP executive

The CHEP is a program run by > 100 volunteers to improve the management of hypertension with the goal of preventing CVD. The CHEP is overseen by a steering committee including 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, BP Canada and the Heart and Stroke



Table 6

Advice for patients to assist them to reduce dietary sodium

DO

- Buy/eat more fresh foods, especially fruit and vegetables
- Buy/eat processed foods with low salt labels or brands with the lowest percentage of sodium on the food label
- Wash canned foods or other salty foods in water before eating/cooking
- Use unsalted spices to add flavour
- Eat less food at restaurants and ask for less salt to be added in your food orders
- Use less sauces on your food
- Eat foods with < 100 mg of sodium per serving

DON'T

- Buy/eat heavily salted foods (e.g., pickled foods, salted crackers or chips, processed meats, etc.)
- Add salt in cooking or at the table
- Eat foods with > 400 mg of sodium per serving

Reprinted with permission from Blood Pressure Canada

Foundation of Canada. The program is based on a rigorous systematic evidence-based approach to annually updated therapeutic recommendations. The program is unique as it has a specific implementation task force with subgroups of FPs, nurses, pharmacists and medical specialists to oversee the translation of the recommendations into education material suited to their disciplines. The CHEP also has a task force to evaluate whether the process is improving hypertension management in Canada.

Identifying and managing risk factors beyond hypertension can reduce the overall risk of CVD by > 60% and can alter the BP target.

Recently, there have been large increases in the diagnosis and treatment of hypertension in Canada and a population BP survey in Ontario (presented at the Canadian Cardiovascular Congress in October 2007) reported the highest rate of treatment and control of hypertension in the world. While encouraging, the results of a national survey on hypertension treatment and control available in 2009 are awaited. The year 2007 was also marked by Health Canada approving the first drug in a decade from a new class of antihypertensive drugs (renin inhibitors). The CHEP is awaiting the results of large outcome clinical trials to determine the role of this new class in clinical practice.

Lastly in 2007, the development of a national strategy to prevent and control CVD in Canada was initiated. The strategy will provide further guidance for optimum prevention and control of hypertension in the context of reducing CVD. 