

2007 Hypertension Education Program (CHEP) Recommendations: Management of hypertension by nurses

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Recent data from the World Health Organization (WHO) indicate that nearly one billion people in the world are suffering from hypertension. Forecasts suggest that, with the aging of the population, this number could reach 1.5 billion by 2025 (Kearney, Whelton, & Reynolds, 2005). In developed countries, more than one in five adults have hypertension (Vasan, Beiser, Seshadri, Larson, Kannel, & D'Agostino, 2002). Statistics for Canada reveal that fewer than 15% of those diagnosed with hypertension are adequately controlled (Joffres, Hamet, MacLean, L'Italien, & Fodor, 2001). Part of the effort to improve hypertension detection, assessment and treatment is an annual process to produce and update evidence-based

recommendations for the management of hypertension and to implement the recommendations (Zarnke, Campbell, McAlister, & Levine, 2000; Campbell, Nagpal, & Drouin, 2001). The most up-to-date 2007 Canadian recommendations for the assessment and management of hypertension are presented. Contemporary nursing practice requires that nurses take responsibility and a role in the primary prevention, detection and treatment of hypertension.

Key words: blood pressure, hypertension, management, recommendations

As providers of health care in a variety of settings, nurses have an important role in ensuring the appropriate assessment and treatment of patients with hypertension. Studies utilizing nurses in the management of blood pressure control have shown lower systolic blood pressure readings in patients treated for hypertension (Coll De Tuero, Sanmartin Albertos, Vargus Vila, Tremols Iglesias, Saez Zafra, & Barcelo Rado, 2004), improved average daily adherence to medication regimens (Rudd, Houston Miller, Kaufman, Kraemer, Bandura, Greenwald, et al, 2004), and higher achievement of target systolic blood pressures in patients with Type II diabetes (Denver, Barnard, Woolfson, & Earle, 2003). In order to capitalize on the opportunity to intervene with hypertensive patients, nurses must be informed on current recommendations for screening and treatment, and understand the key issues impacting the current state of hypertension management.

2007 marks the eighth consecutive year that CHEP has updated recommendations for the management of hypertension. The two key new messages for 2007 are: 1) to assess blood pressure in all Canadian adults and to regularly assess blood pressure in those with high normal values, and 2) to support the increasing evidence that hypertension can be prevented through public health interventions to reduce dietary sodium.

Because of a very heavy burden, coupled with availability of effective lifestyle and drug therapies, prevention, detection, treatment and control of hypertension should receive high priority. CHEP has a mandate to improve hypertension management, to develop tools to aid health care professionals and to evaluate the impact of these activities. CHEP continues to provide the most current evidence-based recommendations to Canadian health care workers.

Thus the new key messages identified in the 2007 recommendations are:

1. All Canadian adults need to have blood pressure assessed at all appropriate clinical visits.

Blood pressure increases with age such that 50% of Canadians over age 65 have hypertension. For those with normal blood pressure at age 65, more than 90% will develop hypertension within their lifespan. To identify those with hypertension, all adults require ongoing assessment of blood pressure throughout their lives.

2. Adults with high normal blood pressure require annual blood pressure assessment.

One in five adult Canadians has high normal blood pressure (130-139/85-89 mmHg). Of those who are overweight and have high normal blood pressure, 40% will develop hypertension within two years and 60% will develop hypertension within four years. Therefore,

annual assessment of blood pressure and appropriate lifestyle interventions to prevent hypertension are recommended for those with high normal blood pressure.

3. Reducing sodium in the diet 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 and the food sector needs to reduce the sodium content of food, either voluntarily or by regulation.

Key CHEP Recommendations

The 2007 CHEP process incorporated all trials and epidemiological observational studies published in the past 12 months felt to have relevance for the treatment of individuals with hypertension. Additionally, (and as in prior years) the impact of these studies was considered in the context of the cumulative evidence of the almost half-century of major clinical trials in hypertension (and in the context of the prior iterations of the evidence-based Canadian hypertension recommendations developed over the past 25 years).

Key message #1: 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%. The blood pressure targets and recommended classes of antihypertensive medications are shown in Table 1 (below) and Table 2 (page 12).

Condition	Target (SBP/DBP mmHg)
Diastolic ± systolic hypertension	<140/90
Isolated systolic hypertension	<140
Diabetes	<130/80
Chronic kidney disease	<130/80
<p><i>* It is recommended that normotensive adults with established cardiovascular disease be treated with an ACE inhibitor. Normotensive adults who have had a stroke or TIA should be treated with an ACE inhibitor and a diuretic.</i></p> <p><i>With permission of the Canadian Hypertension Education Program</i></p>	

Key message #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 from alcohol, reductions in dietary sodium and, in some, stress reduction (Table 3, page 14). Simple and brief health care professional interventions markedly increase the probability of a patient adhering to lifestyle changes.

Key message #3: Treat patients to the recommended targets to achieve optimum cardiovascular risk reduction.

Greater reduction in cardiovascular disease is achieved by lowering the blood pressure to the stated targets.

Key message #4: Combinations of therapies (both drug and lifestyle) are generally necessary to achieve target blood pressures.

Most patients require more than one antihypertensive drug and/or lifestyle changes to achieve recommended blood pressure targets.

Key message #5: Regularly monitor patients whose blood pressure is above target.

To achieve blood pressure control, follow-up at less than two-month intervals is required to both improve patient adherence and increase the intensity of treatment.

Key message #6: Focus on adherence.

Lack of adherence 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, page 14).

Further Recommendations

Lifestyle Recommendations

See table "Lifestyle recommendations for prevention and treatment of hypertension", page 15.

Cardiovascular Risk-Reduction Recommendations

A comprehensive risk-reduction strategy for hypertensive patients

Assess all hypertensive patients for dyslipidemia and diabetes mellitus and manage according to current Canadian guidelines (Canadian Cardiovascular Society Position Statement - Recommendations for the diagnosis and treatment of dyslipidemia and prevention of cardiovascular disease, 2006; Canadian Diabetes Association Clinical Practice Guideline Expert Committee: Canadian Diabetes Association 2003 clinical practice guidelines for the prevention and management of diabetes in Canada, 2003). In addition, the following is recommended.

1. Statin therapy is recommended in certain non-hyperlipidemic hypertensive patients:

(Patients should first be assessed and treated in accordance with the *Canadian Working Group on Hypercholesterolemia and Other Dyslipidemias Recommendations*.)

- Those with established atherosclerotic disease or at high risk for atherosclerotic disease (target LDL<2.0 mmol/L)

- Those with three or more of the following risk factors: 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, family history of premature cardiovascular disease, ECG abnormalities.

Table 2: Considerations in the Individualization of Antihypertensive Therapy			
ACE (Angiotensin-converting enzyme); TIA (transient ischemic attack); ARB (angiotensin II receptor blocker)			
	Initial therapy	Second-line therapy	Notes and/or Cautions
HYPERTENSION WITHOUT OTHER COMPELLING INDICATIONS			
Diastolic +/- Systolic Hypertension	Thiazide diuretics, beta blockers, ACE-inhibitors, ARBs, or long-acting calcium channel blockers (consider ASA and statins in selected patients)	Combinations of first-line drugs	Beta-blockers are not recommended as initial therapy in those over 60 years of age. Hypokalemia should be avoided by considering the use of potassium-sparing agents in those who are prescribed diuretics as monotherapy. ACE inhibitors are not recommended as initial monotherapy in blacks. ACE inhibitors 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	ACE inhibitors or ARBs	Addition of thiazide diuretics, cardioselective beta-blockers, long-acting calcium channel blockers or use an ARB/ACEI combination	If the serum creatinine level is >150 mmol/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 addition of cardioselective beta-blockers and/or long-acting non dihydropyridine calcium channel blockers	Albumin to creatinine ratio [ACR] < 2.0 mg/mmol in men and < 2.8 mg/mmol in women
			<i>Table continued on page 13...</i>

Table continued from page 12...

CARDIOVASCULAR AND CEREBROVASCULAR DISEASE

Angina	Beta-blockers and ACE inhibitors except in low risk revascularized patients	Long-acting calcium channel blockers	Avoid short-acting nifedipine
Prior myocardial infarction	Beta-blockers and ACE inhibitors (ARBs if ACEI-intolerant)	Long-acting calcium channel blockers	
Heart failure	ACE inhibitors (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 ACE inhibitor and ARB.
Left ventricular hypertrophy	ACE inhibitors, ARBs, dihydropyridine calcium channel blockers, diuretics (beta-blockers for patients under 55 years)		Avoid hydralazine and minoxidil
Past cerebrovascular accident or TIA	ACE inhibitor/diuretic combinations		This does not apply to acute stroke. Blood pressure reduction reduces recurrent cerebrovascular events in patients with stable past cerebrovascular disease.

NON DIABETIC CHRONIC KIDNEY DISEASE

Non diabetic chronic kidney disease with proteinuria	ACE inhibitors (ARBs if ACEI- intolerant) diuretics as additive therapy	Combinations of additional agents	Avoid ACE inhibitors or ARB 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 +/- systolic hypertension without compelling indications for other medications		Avoid ACE inhibitors or ARB if 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 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 ASA in patients with controlled blood pressure	Caution should be exercised if blood pressure is not controlled.

2. ASA is strongly recommended as additive therapy once BP is controlled.

3. ACE-inhibitors are recommended for patients with established atherosclerotic disease (e.g., stroke, TIA, coronary artery disease or PAD) even if another antihypertensive agent already controls BP.

Nursing Recommendations

Increased blood pressure is estimated to be the leading risk for death in the world. Nurses contribute to better hypertension control by their efforts to screen, identify cases, refer and track follow-up appointments and educate patients and the public. Nurses must be committed to enhancing BP control through reinforcing messages about the risks of hypertension, the importance of managing blood pressure and achieving BP treatment targets, education about effective lifestyle interventions, pharmacologic therapies and adherence to treatment. Nurses also need to work with other health care professionals to influence and reinforce instructions to improve BP control and patient lifestyles. Nurses can also contribute by addressing

gaps in knowledge and awareness of hypertension in the communities in which they live and work. Finally, advocating for adequate community and workplace programs for managing hypertension and for supporting programs for self-management is important to improving the health of Canadians.

Nurses can improve blood pressure control by:

- **Providing empathetic reinforcement.** Provide positive feedback for blood pressure and behavioural improvement. If blood pressure is not a goal, ask about behaviours to achieve blood pressure control. Schedule more frequent appointments or contact with patients who are not achieving target blood pressures.

<p>Table 3: Lifestyle therapy to reduce the possibility of becoming hypertensive and to reduce blood pressure and to reduce the risk of blood pressure-related cardiovascular complications in hypertensive patients</p>
<p>1. 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.</p>
<p>2. Regular physical activity: accumulation of 30-60 minutes of moderate intensity dynamic exercise 4-7 days per week</p>
<p>3. Low risk alcohol consumption (≤ 2 standard drinks/day and less than 14/week for men and less than 9/week for women)</p>
<p>4. Attaining and maintaining ideal body weight (BMI 18.5-24.9 kg/m²)</p>
<p>5. A waist circumference < 102 cm for men < 88 cm for women</p>
<p>6. Reduction in sodium intake to less than 100 mmol/day</p>
<p>7. A smoke free environment</p>
<p><i>With permission of the Canadian Hypertension Education Program</i></p>

<p>Table 4: Strategies to improve patient adherence</p>
<p>Assist your patient to adhere</p> <ul style="list-style-type: none"> • Tailor pill-taking to fit patients’ daily habits • Simplifying medication regimens to once-daily dosing • Replacing two antihypertensive agents with a fixed dose combination (where available and appropriate), provided it is the same combination the patient is already taking • Utilizing unit-of-use packaging (of several medications to be taken together)
<p>Assist your patient in getting more involved in their treatment</p> <ul style="list-style-type: none"> • Encouraging greater patient responsibility/autonomy in monitoring their blood pressure and adjusting their prescriptions • Educating patients and patients’ families about their disease/treatment regimens
<p>Improve your management in the office and beyond</p> <ul style="list-style-type: none"> • Assessing adherence to pharmacological and non-pharmacological therapy 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 care givers to improve monitoring of adherence with pharmacological and lifestyle modification prescriptions • Utilizing electronic medication compliance aids
<p><i>With permission of the Canadian Hypertension Education Program</i></p>

- **Awareness and monitoring.** Anticipate adherence problems. Encourage patients to bring in all medications from all physicians and all sources, whether prescription, complementary, or over-the-counter, to each visit for review and to rule out iatrogenic causes of elevated blood pressure. Be willing to change unsuccessful regimens and search for those more likely to succeed. Be aware of home monitoring devices recognized by Canadian

Hypertension Society (www.hypertension.ca). Advise patients to monitor BP at home to encourage self-care and adherence.

- **Using decision support systems to achieve BP goals.** Use appointment reminders and follow up patients who have missed appointments. Schedule appointments for BP measurement before the patient leaves the office.

Lifestyle recommendations for prevention and treatment of hypertension		
Topic	Objective	Recommendation
Weight excess	Attain/maintain a healthy BMI (18.5 – 24.9 kg/m ²) and waist circumference (> 102 cm for men and > 88 cm for women) in all normotensive and hypertensive individuals for prevention/management of hypertension.	Encourage multidisciplinary approach to weight loss, including dietary education, increased physical activity and behavioural modification. BP may be reduced by 7.2/5.9 mmHg for every 4.5 kg weight loss.
Dietary	DASH diet and sodium reduction.	DASH Diet: Diet that emphasizes fresh fruits, vegetables, dietary fibre, non-animal (e.g., soy) protein and low-fat dairy products, and that is reduced in saturated fat and cholesterol. Dietary sodium intake: - Less than 100 mmol (2300 mg) sodium/day. In hypertensive patients, the DASH diet reduced BP by 11.4/5.5 mmHg. (For more information on the DASH diet: www.nhlbi.nih.gov/hbp/prevent/h_eating/h_eating.htm) (Canadian Food Guide: www.hc-sc.gc.ca/hpfb-dgps/onpp-bppn/food_guide_rainbow_e.htm)
Physical activity	Should be prescribed to both hypertensive and normotensive individuals for prevention/management of hypertension.	An accumulation of 30-60 minutes of dynamic exercise of moderate intensity (e.g., walking, cycling, non-competitive swimming), on 4-7 days each week. Higher intensities are no more effective at BP lowering but may produce other cardiovascular benefits. (For more information on physical activity: www.healthcanada.ca/paguide)
Alcohol	Limited consumption.	Less than or equal to 2 drinks per day. Men: Less than or equal to 14 drinks per week. Women: Less than or equal to 9 drinks per week. Limiting alcohol consumption can reduce blood pressure.
Stress	Stress management.	Individualized cognitive behaviour interventions are more likely to be effective when relaxation techniques are employed.
Smoking	As a cardiovascular risk reduction strategy.	Abstinence from smoking. A smoke-free environment. Encourage smoking cessation. (Best Practice Guidelines, RNAO, 2003 www.rnao.org/bestpractices)

- **Providing patient education about treatment.** Patient-centred behavioural interventions, such as counselling, improve BP control. Assess the patient's understanding and acceptance of the diagnosis of hypertension. Ask about the patient's concerns and questions. Tell the patient the blood pressure reading and provide a written copy for the patient. Discuss with the patient the recommended treatment and provide written information regarding the role of lifestyle change: diet, reducing dietary sodium, physical activity, alcohol intake and maintaining normal body weight. Provide updated patient management recommendations (available at www.hypertension.ca in the public section) or other written material. Take time to review the pertinent content with the patient.
- **Emphasizing important points.** The need to continue treatment once BP therapy has begun. Control does not mean cure. Blood pressure needs to be measured; one cannot tell if blood pressure is elevated by "feel or symptoms".
- **Individualizing a BP regimen.** Include the patient in decision-making. Simplify regimens as much as possible. Try to incorporate treatment in patients' daily lifestyle. Encourage setting of realistic short-term goals for specific components of lifestyle modification plans. Nurse empathy increases patient trust, motivation and adherence to therapy. Also consider patients' cultural beliefs and individual attitudes in formulating therapy regimens.

Conclusion

Hypertension is a prevalent and deadly condition; nurses, alone or in collaboration with other health professionals, should play a major role in its management. In a recent study endorsed by CHEP, nurses are working in collaboration with pharmacists in the community (SCRIP-HTN: Improving Blood Pressure Management in Patients with Diabetes). This randomized control trial has nurse-pharmacist teams identifying patients at risk of high blood pressure and helps them to manage their condition. The study suggests a new way of delivering care. It is not "instead of" physicians, but complementary. With shortages of family physicians, this is one other way that nurses and pharmacists can help us tackle the problem of high blood pressure. The study hopes to show that care in the community by nurses and pharmacists can both identify people with high blood pressure and get them treated to reach their target blood pressure (McLean, McAlister, Johnson, King, Jones, & Tsuyuki, 2006).

Treatment and control of hypertension in people is a major public health problem, and improving detection and control of hypertension is a major goal of the Canadian Hypertension Society and CHEP. It is hoped that the Canadian Hypertension Education Program (CHEP) 2007 recommendations will be used to help nurses further contribute to the improved care of patients with hypertension and, ultimately, enhance patient outcomes. ♥

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