



Recognition and Management of Hypertension by Nurses: Action in Patients with Diabetes is Critical

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The Canadian Hypertension Education Program (CHEP), Canadian Hypertension Society, Blood Pressure Canada, Canadian Diabetes Association, College of Family Physicians of Canada, Canadian Pharmacists Association, Heart and Stroke Foundation of Canada, and the Canadian Council of Cardiovascular Nurses issued a recent call for all health care professionals in Canada to double their efforts to assist patients with diabetes in maintaining target blood pressures (Campbell et al., 2009b). Blood pressure (B/P) in diabetic individuals should be less than 130 mmHg systolic and less than 80 mmHg diastolic (CHEP, 2009). Considering recognition and treatment of hypertension in people with diabetes can result in reductions in disability and death, control of hypertension must become an interdisciplinary priority. Maintaining B/P less than 130/80 mmHg requires lifestyle modification as the cornerstone to treatment and often two or more B/P medications (Campbell et al., 2009a). The cost of multiple drugs required for B/P control in diabetic individuals is one of the few treatments estimated to reduce overall health costs and related cardiovascular

disease complications (Gillies, Abrams, & Lambert, 2007). Nurses are essential partners in assessing and assisting diabetic patients and all patients with hypertension to reduce overall cardiovascular risks. Nurses may also be key practitioners in assessing and monitoring patient difficulties with adherence to lifestyle or pharmacological interventions (Jayasinghe, 2009; McLean et al., 2008). Individualized lifestyle counselling and treatment modification are recommended to maintain target B/P and treat dysglycemia, dyslipidemia, smoking or any other cardiovascular risks in diabetic individuals.

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Key words: hypertension, diabetes, sodium, obesity

Individuals with diabetes and hypertension are at increased risk for cardiovascular complications

Hypertension (HTN) is the leading risk factor for cardiovascular deaths in the world, the second leading cause of disability in the world, and the most common reason for office-based visits to Canadian physicians (Ezzati, Lopez, Rodgers, Vander Hoorn, & Murray, 2002; He & MacGregor, 2008). Raised blood pressure accounts for 49% of coronary heart disease and 62% of strokes worldwide (He & MacGregor, 2008). Hypertension is a multifactorial condition that can include genetic and lifestyle factors. In adult Canadians, one-quarter have high blood pressure and more than 90% will develop HTN, if they live an average lifespan, largely attributable to lifestyle choices

including smoking, poor dietary habits, excess sodium consumption, physical inactivity or obesity (Geleijnse, Grobbee & Kok, 2005; He & MacGregor, 2008). Diabetes affects approximately 150 million people worldwide (1.8 million adult Canadians) or 5.5% of the Canadian population (Canadian Diabetes Association, 2008). Current hypertension and diabetes definitions are provided in Table 1. For individuals with diabetes, high blood pressure is an enormous health risk with devastating complications. Up to 80% of people with diabetes die of cardiovascular complications and 75%

Quiz Answers

Answers to quiz on page 7.

1. c, 2. a, 3. a, 4. a, 5. a, 6. b, 7. a, 8. c.

of specific cardiovascular complications including stroke or end stage renal disease are attributed to HTN (Sowers, Epstein, & Frohlich, 2001). Most people with diabetes have or will develop HTN and 17% of individuals with a blood pressure of 140/90 or greater have a diagnosis of diabetes (Leenen, Dumais, & McInnis, 2008). Fewer than one in eight people with diabetes and hypertension have adequately controlled B/P (McLean, Simpson, McAlister, & Tsuyuki, 2006). Due to the same poor lifestyle choices associated with HTN, the burden of disease is primarily type 2 diabetes and additional cardiovascular risks such as dyslipidemia tend to also be present (Khan, Chockalingam, & Campbell, 2002).

In people with hypertension and diabetes, reducing blood pressure has been shown to reduce disability and death (Anderson, Arima, & Belmans, 2005; Campbell et al., 2009b; Gerstein, Yusuf, & Mann, 2000; Hansson, Zanchetti, & Carson, 1998). According to the CHEP 2009 guidelines, target blood pressure should be less than 130mmHg systolic and less than 80mmHg diastolic in individuals with diabetes. Despite these known facts, in a recent Ontario survey, two-thirds of diabetic Canadians with HTN had a blood pressure that was not controlled (Leenen et al., 2008). Even with evidence that aggressive lowering of B/P in people with diabetes decreases cardiovascular risk and mortality, B/P control in individuals with diabetes is far from being optimal. Moreover, B/P control in diabetics may be even worse in Canada, as approximately only two-thirds of people with diabetes are diagnosed, and this suggests that those undiagnosed diabetic individuals might also have poorer B/P control (McLean et al., 2006).

Table 1: The Definition of Diabetes and of Hypertension in the Presence of Diabetes

	Definition
Diabetes	<ul style="list-style-type: none"> • Fasting plasma glucose of 7 mmol/L or • Casual plasma glucose of 11.1 mmol/L or higher with symptoms of diabetes or • 2-hour plasma glucose of 11.1 mmol/L or higher
Hypertension in people with diabetes	Systolic BP \geq 130 mmHg or Diastolic BP \geq 80 mmHg
<i>Data from CHEP (2009) and Canadian Diabetes Association (2008) Clinical Practice Guidelines for the Prevention and Management of Diabetes in Canada.</i> <i>Reprinted with permission from Canadian Hypertension Education Program (2009).</i>	

Nurses are essential partners in assisting patients to adopt lifestyle changes and improve self-efficacy in managing blood pressure

Registered nurses and nurse practitioners are ideally positioned to deliver effective patient and public education in assisting individuals to modify risk factors including reducing dietary sodium consumption to reduce blood pressure (Table 2). Nurses can also positively influence patients to understand why they might require more than two different B/P medications such as angiotensin enzyme inhibitors, angiotensin receptor blockers, beta-blockers or calcium channel blockers and/or diuretics to maintain target blood pressures (Anderson et al., 2005; Jayasinghe, 2009; McLean et al., 2008; Yusuf, Teo, & Progue, 2008) and why medications such as lipid-lowering or anti-platelet drugs might also be required in addition to hypoglycemic agents to reduce global cardiovascular

Table 2: Lifestyle Therapy to Reduce the Risk of Blood Pressure-Related Cardiovascular Complications in Hypertension

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.
2. Regular physical activity: accumulation of 30 to 60 minutes of moderate intensity dynamic exercise 4-7 days per week in addition to daily activities.
3. Low-risk alcohol consumption (\leq 2 standard drinks/day and less than 14/week for men and less than 9/week for women. One standard drink is a glass of wine (5 oz/142 mL of 12% alcohol content), one beer (12 oz/341 mL of 5% alcohol) or 1 shot of spirits (1.5 oz / 43 mL of 40% alcohol).
4. Attaining and maintaining ideal body weight (BMI 18.5 to 24.9 kg/m²)
5. A waist circumference:

European	< 102 cm for men
	< 88 cm for women
Japanese, South Asian,	< 90 cm for men
Chinese	< 80 cm for women
6. Reduction in sodium intake to less than 2300 mg/day.
7. A smoke-free environment.
8. In people in whom stress may be contributing to blood pressure elevation, stress management should be considered.

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risks. With characteristics of professionalism, knowledge, skill and caring, as well as breadth and diversity in diverse clinical settings, nurses can contribute to patient care management of HTN and HTN in diabetic individuals so that target blood pressures are achieved and maintained (CHEP 2009; Jayasinghe, 2009; McLean et al., 2008). Interventions by nurses and other health care professionals may increase the probability of an individual making sustained lifestyle changes and comprehensive interdisciplinary treatments including pharmacotherapy more effective (Gillies et al., 2007; Jayasinghe, 2009; McLean et al., 2008; Naik, Isaac, Street, & Kunik, 2007). Nurses' involvement can be at all stages in the management of HTN, from prevention and early detection to treatment and self-management in a variety of clinical settings. Screening for raised B/P at every opportunity and follow up through correct B/P measurement or teaching home B/P measurements to enhance self-efficacy are good examples of simple steps that can truly make a difference. As well, nurses are in an ideal position to advocate for the political will to influence the food manufacturing industry and government to lower sodium content in food and beverage products produced in Canada (He & MacGregor, 2008).

Global cardiovascular risk reduction in people with diabetes

Increased blood pressure represents a major health risk to people with diabetes. Up to 75% of diabetes-related cardiovascular complications have been attributed to high blood pressure (Sowers et al., 2001). Blood pressure and hyperglycemia can be reduced by lifestyle interventions including a healthy diet, low-risk alcohol consumption, reductions in dietary sodium and, for some individuals, stress reduction (Table 2). The Diabetes Prevention Trial demonstrated that a 5% to 10% reduction in body weight through lifestyle change could substantially improve blood sugar and blood pressure control, as well as dyslipidemia (Knowles, Barrett-Conner, & Fowler, 2002). The same trial demonstrated a 58% reduction in progression to type 2 diabetes with aggressive lifestyle intervention compared to a 38% reduction with metformin. Reisin & Jack (2009) indicate a weight loss of 10 kg results in a 5 mmHg to 20 mmHg reduction in systolic B/P achieving results similar to taking one blood pressure medication.

Simply following a 2300mg sodium-restricted diet can reduce a systolic BP by 5 mmHg, achieving a significant risk reduction (CHEP, 2009). CHEP (2009) recommends following the dietary approaches to stop hypertension (DASH) diet to reduce sodium intake and maintain a normal potassium level.

Smoking is a risk factor for developing diabetes (Willi, Bodenmann, Ghali, Faris, & Cornuz, 2007) and is an

obvious first step in addressing lifestyle change because smoking cessation reduces mortality by almost 20% (Anthonisen et al., 2007). Moderate physical activity of 30 to 60 minutes, four to seven days per week is independently associated with a reduction in blood pressure, type 2 diabetes, cardiovascular events, and all cause mortality (CHEP, 2009).

Global risk reduction through a comprehensive program inclusive of lifestyle and pharmacotherapy for multiple risk factors has been associated with a 40% reduction in total mortality (Gaede, Lund-Andersen, Parving, & Pedersen, 2008). Nurses are key players in an interdisciplinary approach to assist patients with lifestyle modification and compliance with pharmacological therapies.

Nursing education informs registered nurses in the concepts of adult education, stages of change and readiness for change, as well as patient self-management models. This information arms nurses with the ability to encourage individual, realistic goal setting for lifestyle change, as well as monitoring of success through modalities such as home blood pressure monitoring similar to home blood glucose monitoring. Lifestyle intervention is a cornerstone to the management of both HTN and diabetes. Hypertension and type 2 diabetes can be prevented through education, realistic individual goal setting, and identifying barriers to change. By doubling efforts, nurses can markedly contribute to successful interdisciplinary management of HTN and global risk factor reduction in diabetic individuals to reduce the devastating cardiovascular complications including renal failure, eye disease, limb amputations, myocardial infarction or stroke in this patient population.

Canadian Hypertension Education Program. A call to action in people with diabetes: Target blood pressure to less than 130/80 mmHg

The CHEP recommendations provide conscientious, explicit, judicious use of research-based information to assist nursing decisions about educational options and approaches with our individual patients along with consideration of group needs and preferences. For nurses, the CHEP recommendations provide, contribute to and expand the ways in which nurses think about hypertension and diabetes and manage hypertension in the population of patients they serve.

The key CHEP (2009) recommendations and Call to Action messages in people with diabetes include:

1. Assess blood pressure at all appropriate visits.
2. Encourage people with hypertension to use approved devices and proper technique to measure blood pressure at home.

3. Ensure people with hypertension are screened for diabetes, and people with diabetes are screened for HTN. Treat hypertension in people with diabetes with a combination of lifestyle changes and pharmacotherapy to control blood pressure to less than 130/80mmHg. Many require use of three or more antihypertensive drugs including diuretics to achieve blood pressure targets.
4. Assess and manage overall cardiovascular risk in all people with hypertension including: smoking, dyslipidemia, dysglycemia, abdominal obesity, unhealthy eating, and physical inactivity.
5. Sustained lifestyle modification is the cornerstone for the prevention and management of hypertension and cardiovascular disease (CVD). Intensive individualized lifestyle modification is used to prevent and treat hypertension, dysglycemia and other vascular risks
6. Treat blood pressure to less than <140/90 mmHg in most people and to less than 130/80 mmHg in people with diabetes or chronic kidney disease. More than one drug is usually required.

7. Self-management education is encouraged, including home measurement of blood pressure.
8. In people for whom stress may be contributing to blood pressure elevation, stress management should be considered. ♥

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Additional references are on page 11.

Clinical practice questions



1. In a 2008 Ontario survey published in the **Canadian Medical Association Journal**, uncontrolled blood pressure in Canadians with hypertension and diabetes was reported to be:
 - a) 1/4
 - b) 1/3
 - c) 2/3
 - d) 1/2
2. Sixty per cent to 80% of people with diabetes die of cardiovascular complications.
 - a) true
 - b) false
3. Up to 75% of cardiovascular complications in diabetics, such as stroke or end stage renal disease, are attributed to hypertension.
 - a) true
 - b) false
4. Hypertension and type 2 diabetes can be prevented and/or managed with lifestyle modification as the cornerstone of therapeutic intervention.
 - a) true
 - b) false
5. For most people with hypertension target B/P should be:
 - a) less than 140/90
 - b) less than 130/80
 - c) less than 150/90
6. Maximal sodium intake for most individuals with hypertension should be:
 - a) less than 3,200 mg/day
 - b) less than 2,300 mg/day
 - c) less than 1,800 mg/day
7. Worldwide, hypertension accounts for 62% of strokes and 49% of coronary heart disease.
 - a) true
 - b) false
8. It has been shown that a 5 mmHg to 20 mmHg reduction in systolic B/P can be achieved with a weight loss of:
 - a) 3kg
 - b) 5kg
 - c) 10kg