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Nursing Best Practice Guideline *Shaping the future of Nursing*

Nursing Management of Hypertension



HEART
AND STROKE
FOUNDATION
OF ONTARIO

Finding answers. For life.



RNAO

Registered Nurses' Association of Ontario
L'Association des infirmières et infirmiers
autorisés de l'Ontario

NURSING BEST PRACTICE GUIDELINES PROGRAM



Greetings from Doris Grinspun

Executive Director

Registered Nurses Association of Ontario

It is with great excitement that the Registered Nurses' Association of Ontario (RNAO) is partnering with the Heart and Stroke Foundation of Ontario in the development, evaluation and dissemination of the guideline *Nursing Management of Hypertension*. Evidence-based practice supports the excellence in service that nurses are committed to deliver in our day-to-day practice and we are delighted to provide this key resource to you.

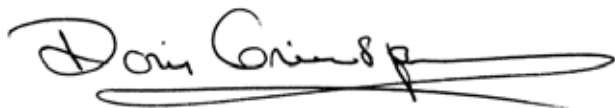
RNAO offers its heartfelt thanks to the many individuals and institutions that are making our vision for Nursing Best Practice Guidelines a reality. As you are aware, the Government of Ontario recognized our ability to lead this program and is providing multi-year funding. BPG Program Director Tazim Virani and her amazing team of experts are putting those funds to good use, moving this program forward faster and stronger than ever imagined. The nursing community, with its commitment and passion for excellence in nursing care, is providing the knowledge and countless hours essential to the development, implementation, evaluation and revision of each guideline. Employers have responded enthusiastically by nominating best practice champions, implementing and evaluating the guidelines and working towards a culture of evidence-based practice. A special thanks to the *Nursing Management of Hypertension* guideline panel, led by Cindy Bolton and resource staff Heather McConnell. We respect and value your expertise and tremendous commitment.

Partnerships such as ours provide a tremendous opportunity to network and share expertise in the development of guidelines. The collaboration between the Heart and Stroke Foundation of Ontario and RNAO creates a synergy in dissemination and uptake efforts. The endorsement of this guideline by the Canadian Hypertension Education Program (CHEP) demonstrates the strong support of this important stakeholder group, and offers opportunities for networking at the national level.

Successful uptake of these guidelines requires a concerted effort from nurse clinicians and their healthcare colleagues from other disciplines, from nurse educators in academic and practice settings and from employers. After lodging these guidelines into their minds and hearts, knowledgeable and skillful nurses and nursing students need healthy and supportive work environments to help bring these guidelines to life.

We ask that you share this guideline with members of the interdisciplinary team. There is much to learn from one another. Together, we can ensure that Ontarians receive the best possible care every time they come in contact with us. Let's make them the real winners in this important effort!

The RNAO is pleased to have had the pleasure of working with the Heart and Stroke Foundation of Ontario in this important initiative. We look forward to future opportunities for collaboration. Together, we are building a healthier Ontario!



Doris Grinspun, RN, MScN, PhD(c), OOnt.
Executive Director
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Terry Coote

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Heart and Stroke Foundation of Ontario

The Heart and Stroke Foundation of Ontario is pleased to partner with the Registered Nurses' Association of Ontario in the creation of a nursing best practice guideline on *Hypertension*.

This important work is part of the Primary Care Partnerships for Blood Pressure Reduction strategy, a project funded by the Ministry of Health and Long-Term Care under the Primary Health Care Transition Fund. Recognizing that a nursing best practice guideline did not exist in this area, the Heart and Stroke Foundation and the RNAO agreed to produce such a guideline, in a collaborative effort that addresses all aspects of hypertension management across the scope of nursing practice.

The Heart and Stroke Foundation is currently leading the High Blood Pressure Strategy, which is a five-year plan with the potential to show a significant positive impact on hypertension in Ontario. This plan is comprised of two major components, namely enhancement of primary healthcare providers' management of hypertensive patients, and research into two emerging areas. These research endeavours include studying the role of systolic blood pressure in patients aged 45 and older, as well as examining issues about the social determinants of high blood pressure. Several other key activities will inform these two main components, such as a prevalence survey to update the 1992 Heart Health Survey statistics for hypertension in Ontario, a strong evaluation plan focused on both the 5-year impact of the strategy and its major elements, as well as advocacy efforts to speak to prospective system-based matters that emerge during the course of the plan.

Fundamentally, to enhance hypertension management by providers requires professional education. The introduction of professional education resources and interventions that utilize the principles of adult learning, along with an interdisciplinary team approach, is expected to maximize the impact on high blood pressure reduction and control. Developing and disseminating best practice guidelines for hypertension is another essential part of professional education. Participating with RNAO in the Nursing Best Practice Guidelines Program has allowed the High Blood Pressure Strategy the opportunity to augment the implementation of best practices for hypertension management across Ontario. We are especially appreciative of the support of RNAO and the tremendous work of the guideline panel, led by Cindy Bolton.

We are pleased to be part of this important initiative and look forward to working with RNAO on future nursing best practice guidelines.

A handwritten signature in black ink, appearing to read 'Terry Coote', written over a light blue grid background.

Terry Coote
Manager, Professional Education
Heart and Stroke Foundation of Ontario



Nursing Management of Hypertension

Disclaimer

These best practice guidelines are related only to nursing practice and not intended to take into account fiscal efficiencies. These guidelines are not binding for nurses and their use should be flexible to accommodate client/family wishes and local circumstances. They neither constitute a liability or discharge from liability. While every effort has been made to ensure the accuracy of the contents at the time of publication, neither the authors nor the HSFO or RNAO give any guarantee as to the accuracy of the information contained in them nor accept any liability, with respect to loss, damage, injury or expense arising from any such errors or omission in the contents of this work. The views expressed in this guideline do not necessarily reflect those of the Ministry of Health and Long-Term Care. Any reference throughout the document to specific pharmaceutical products as examples does not imply endorsement of any of these products.

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How to Use this Document

This nursing best practice guideline is a comprehensive document providing resources necessary for the support of evidence based nursing practice. The document needs to be reviewed and applied, based on the specific needs of the organization or practice setting/environment, as well as the needs and wishes of the client. Guidelines should not be applied in a “cookbook” fashion but used as a tool to assist in decision making for individualized client care, as well as ensuring that appropriate structures and supports are in place to provide the best possible care.

Nurses, other healthcare professionals and administrators who are leading and facilitating practice changes will find this document valuable for the development of policies, procedures, protocols, educational programs, assessment and documentation tools, etc. It is recommended that this nursing best practice guideline be used as a resource tool. Nurses providing direct client care will benefit from reviewing the recommendations, the evidence in support of the recommendations and the process that was used to develop the guidelines. However, it is highly recommended that practice settings/environments adapt these guidelines in formats that would be user-friendly for daily use. This guideline has some suggested formats for such local adaptation and tailoring.

Organizations wishing to use the guideline may decide to do so in a number of ways:

- Assess current nursing and healthcare practices using the recommendations in the guideline.
- Identify recommendations that will address identified needs or gaps in services.
- Systematically develop a plan to implement the recommendations using associated tools and resources.

The HSFO and the RNAO are interested in hearing how you have implemented this guideline. Please contact us to share your story. Implementation resources are available through the RNAO website to assist individuals and organizations to implement best practice guidelines.

This guideline has been endorsed by the *Canadian Hypertension Education Program*.

Nursing Management of Hypertension

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Summary of Recommendations

RECOMMENDATION		*LEVEL OF EVIDENCE
Practice Recommendations		
Detection and Diagnosis	1.1 Nurses will take every appropriate opportunity to assess the blood pressure of adults in order to facilitate early detection of hypertension.	IV
	1.2 Nurses will utilize correct technique, appropriate cuff size and properly maintained/calibrated equipment when assessing clients' blood pressure.	IV
	1.3 Nurses will be knowledgeable regarding the process involved in the diagnosis of hypertension.	IV
	1.4 Nurses will educate clients about self/home blood pressure monitoring techniques and appropriate equipment to assist in potential diagnosis and the monitoring of hypertension.	IV
	1.5 Nurses will educate clients on their target blood pressure and the importance of achieving and maintaining this target.	IV
Assessment and Development of a Treatment Plan		
Lifestyle Interventions	2.1 Nurses will work with clients to identify lifestyle factors that may influence hypertension management, recognize potential areas for change and create a collaborative management plan to assist in reaching client goals, which may prevent secondary complications.	IV
Diet	2.2 Nurses will assess for and educate clients about dietary risk factors as part of management of hypertension, in collaboration with dietitians and other members of the healthcare team.	IV
	2.3 Nurses will counsel clients with hypertension to consume the DASH Diet (Dietary Approaches to Stop Hypertension), in collaboration with dietitians and other members of the healthcare team.	Ib
	2.4 Nurses will counsel clients with hypertension to limit their dietary intake of sodium to the recommended quantity of 65-100 mmol/day, in collaboration with dietitians and other members of the healthcare team.	Ia
Healthy Weight	2.5 Nurses will assess clients' weight, Body Mass Index (BMI) and waist circumference.	IV
	2.6 Nurses will advocate that clients with a BMI greater than or equal to 25 and a waist circumference over 102 cm (men) and 88 cm (women) consider weight reduction strategies.	IV
Exercise	2.7 Nurses will assess clients' current physical activity level.	IV
	2.8 Nurses will counsel clients, in collaboration with the healthcare team, to engage in moderate intensity dynamic exercise to be carried out for 30-60 minutes, 4 to 7 times a week.	Ia
Alcohol	2.9 Nurses will assess clients' use of alcohol, including quantity and frequency, using a validated tool.	Ib
	2.10 Nurses will routinely discuss alcohol consumption with clients and recommend limiting alcohol use, as appropriate to a maximum of: <ul style="list-style-type: none"> Two standard drinks per day or 14 drinks per week for men; One standard drink per day or 9 drinks per week for women and lighter weight men. 	III
Smoking	2.11 Nurses will be knowledgeable about the relationship between smoking and the risk of cardiovascular disease.	IV

*See page 17 for details regarding "Interpretation of Evidence".

RECOMMENDATION		
	2.12 Nurses will establish clients' tobacco use status and implement Brief Tobacco Interventions at each appropriate visit, in order to facilitate smoking cessation.	Ia
Stress	2.13 Nurses will assist clients diagnosed with hypertension to understand how they react to stressful events and to learn how to cope with and manage stress effectively.	IV
Medications	3.1 Nurses will obtain clients' medication history, which will include prescribed, over-the-counter, herbal and illicit drug use.	IV
	3.2 Nurses will be knowledgeable about the classes of medications that may be prescribed for clients diagnosed with hypertension.	IV
	3.3 Nurses will provide education regarding the pharmacological management of hypertension, in collaboration with physicians and pharmacists.	IV
Assessment of Adherence	4.1 Nurses will endeavour to establish therapeutic relationships with clients.	IV
	4.2 Nurses will explore clients' expectations and beliefs regarding their hypertension management.	III
	4.3 Nurses will assess clients' adherence to the treatment plan at each appropriate visit.	III
Promotion of Adherence	4.4 Nurses will provide the information needed for clients with hypertension to make educated choices related to their treatment plan.	III
	4.5 Nurses will work with prescribers to simplify clients' dosing regimens.	Ia
	4.6 Nurses will encourage routine and reminders to facilitate adherence.	Ia
	4.7 Nurses will ensure that clients who miss appointments receive follow-up telephone calls in order to keep them in care.	IV
Monitoring and Follow-up	5.1 Nurses will advocate that clients who are on antihypertensive treatment receive appropriate follow-up, in collaboration with the healthcare team.	IV
Documentation	6.1 Nurses will document and share comprehensive information regarding hypertension management with the client and healthcare team.	IV
Education Recommendation		
	<p>7.1 Nurses working with adults with hypertension must have the appropriate knowledge and skills acquired through basic nursing education curriculum, ongoing professional development opportunities and orientation to new work places. Knowledge and skills should include, at minimum:</p> <ul style="list-style-type: none"> ■ Pathophysiology of hypertension; ■ Maximizing opportunities for detection; ■ Facilitating diagnosis; ■ Assessing and monitoring clients with hypertension; ■ Providing appropriate client/family education; ■ Supporting lifestyle changes; ■ Promoting the empowerment of the individual; and ■ Documentation and communication with the client and other members of the healthcare team. 	IV

RECOMMENDATION		
Organization & Policy Recommendations		
	8.1 Healthcare organizations will promote a collaborative practice model within the interdisciplinary team to enhance hypertension care and promote the nurses' role in hypertension management.	IV
	8.2 Healthcare organizations will establish care delivery systems that allow for training in adherence management, as well as a means of accurately assessing adherence and those factors that contribute to it.	IV
	8.3 Healthcare organizations will develop key indicators and outcome measurements that will allow them to monitor: <ul style="list-style-type: none"> ■ the implementation of the guidelines, ■ the impact of these guidelines on optimizing quality client care, ■ efficiencies, or cost effectiveness achieved. 	IV
	8.4 Nursing best practice guidelines can be successfully implemented only where there are adequate planning, resources, organizational and administrative support, as well as appropriate facilitation. Organizations may wish to develop a plan for implementation that includes: <ul style="list-style-type: none"> ■ An assessment of organizational readiness and barriers to education. ■ Involvement of all members (whether in a direct or indirect supportive function) who will contribute to the implementation process. ■ Dedication of a qualified individual to provide the support needed for the education and implementation process. ■ Ongoing opportunities for discussion and education to reinforce the importance of best practices. ■ Opportunities for reflection on personal and organizational experience in implementing guidelines. 	IV



Interpretation of Evidence

Levels of Evidence

- Ia Evidence obtained from meta-analysis of randomized controlled trials.
- Ib Evidence obtained from at least one randomized controlled trial.
- IIa Evidence obtained from at least one well-designed controlled study without randomization.
- IIb Evidence obtained from at least one other type of well-designed quasi-experimental study, without randomization.
- III Evidence obtained from well-designed non-experimental descriptive studies, such as comparative studies, correlation studies and case studies.
- IV Evidence obtained from expert committee reports or opinions and/or clinical experiences of respected authorities.



Responsibility for Development

As a support to nurses in applying evidence to their practice, the Heart and Stroke Foundation of Ontario (HSFO) and the Registered Nurses' Association of Ontario (RNAO) have joined together in partnership to develop and evaluate a best practice guideline focusing on nursing management of hypertension. This guideline was developed by a panel of nurses, conducting its work independent of any bias or influence from the Government of Ontario. Funding for this work was provided by the Ontario Ministry of Health and Long-Term Care – Primary Health Care Transition Fund.

Purpose & Scope

Best practice guidelines are systematically developed statements to assist practitioners' and clients' decisions about appropriate health care (Field & Lohr, 1990). This best practice guideline focuses on assisting nurses working in diverse practice settings in the management of hypertension. This work is being conducted to support the Heart and Stroke Foundation of Ontario's High Blood Pressure AIM (Areas of Investment in Mission) initiative, which was launched in September 2004, and is comprised of two major streams:

1. Improving the management of high blood pressure by doctors, nurses and pharmacists. Working with several key partners, including the Ontario College of Family Physicians, the Registered Nurses' Association of Ontario, and the Ontario Pharmacists' Association, the plan creates new educational opportunities that are designed to enhance physician, pharmacist, and nursing approaches to high blood pressure detection, intervention, and follow up measures.
2. Research into:
 - a. the social determinants of hypertension (non-traditional risk factors and conditions that are linked to high blood pressure, such as socioeconomic status or stressful life environments); and
 - b. the role of systolic blood pressure level (upper number) in high blood pressure. The HBP AIM plan includes a significant investment in a province-wide research competition to better understand this emerging area.

The development of a guideline on the management of high blood pressure by nurses was identified as an appropriate strategy to facilitate nursing interventions in hypertensive management as a component of the first stream of this initiative. The development of this guideline is the mandate of the RNAO and the development panel. The second stream (research) is being coordinated by the HSFO, and is not a component of the guideline development work.

The goal of this document is to provide nurses with recommendations, based on the best available evidence, related to nursing interventions for high blood pressure detection, client assessment and development of a collaborative treatment plan, promotion of adherence and ongoing follow-up.

Nurses working in partnership with the interdisciplinary health care team, clients and their families, have an important role in detection and management of hypertension. This guideline focuses on:

- ♥ the care of adults 18 years of age and older (including the older adult over 80);
- ♥ the detection of high blood pressure;
- ♥ nursing assessment and interventions for those who have a diagnosis of hypertension.

This is not meant to exclude the pediatric client, but children have special assessment needs related to developmental stages that are beyond the scope of this guideline. This guideline also does not address hypertension in adults related to: pregnancy, transient hypertension, pulmonary hypertension, endocrine hypertension, or hypertension related to secondary causes (i.e., renal disease).

This guideline contains recommendations for Registered Nurses and Registered Practical Nurses on best nursing practices in the care of adults with hypertension. It is intended for nurses who are not necessarily experts in management of hypertension, who work in a variety of practice settings, including both primary care and secondary prevention. It is acknowledged that the individual competencies of nurses varies

between nurses and across categories of nursing professionals and are based on knowledge, skills, attitudes, critical analysis and decision making which are enhanced over time by experience and education. It is expected that individual nurses will perform only those aspects of hypertension management for which they have received appropriate education and experience and that they will seek appropriate consultation in instances where the client's care needs surpass their ability to act independently.

It is acknowledged that effective healthcare depends on a coordinated interdisciplinary approach incorporating ongoing communication between health professionals and clients/families.

Development Process

In October of 2004, a panel of nurses with expertise in hypertension management from a range of practice settings was convened under the auspices of the HSFO and the RNAO. The panel discussed the purpose of their work, and came to consensus on the scope of the best practice guideline. Subsequently, a search of the literature for clinical practice guidelines, systematic reviews, relevant research articles and websites was conducted. See *Appendix A* for details of the search strategy and outcomes.

Several international guidelines have reviewed the evidence related to hypertension, and it was determined that a critical appraisal of these existing guidelines would serve as a “foundation” for guideline development. A total of 12 clinical practice guidelines on the topic of hypertension were identified that met the following initial inclusion criteria:

- published in English;
- developed in 1999 or later;
- strictly on the topic of hypertension;
- evidence-based; and
- the guideline is available and accessible for retrieval.

Members of the development panel critically appraised these 12 guidelines using the *Appraisal of Guidelines for Research and Evaluation Instrument* (AGREE Collaboration, 2001). This resulted in a decision to work primarily with five existing guidelines. These were:

Canadian Hypertension Society 2004 (CHEP, 2004):

- Hemmelgarn, B., Zarnke, K., Campbell, N., Feldman, R., McKay, D., McAlister, F. et al. (2004). The 2004 Canadian Hypertension Education Program recommendations for the management of hypertension: Part I – Blood pressure measurement, diagnosis and assessment of risk. *Canadian Journal of Cardiology*, 20(1), 31-40.
- Khan, N., McAlister, F., Campbell, N., Feldman, R., Rabkin, S., Mahon, J. et al. (2004). The 2004 Canadian Hypertension Education Program recommendations for the management of hypertension: Part II – Therapy. *Canadian Journal of Cardiology*, 20(1), 41-54.
- Touyz, R., Campbell, N., Logan, A., Gledhill, N., Petrella, R., Padwal, R. et al. (2004). The 2004 Canadian Hypertension Education Program recommendations for the management of hypertension: Part III – Lifestyle modifications to prevent and control hypertension. *Canadian Journal of Cardiology*, 20(1), 55-9.

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Canadian Medical Association (CMA, 1999):

- Feldman, R., Campbell, N., Larochelle, P., Bolli, P., Burgess, E., Carruthers, S. et al. (1999). 1999 Canadian recommendations for the management of hypertension. *Canadian Medical Association Journal*, 161(12 Suppl), S1-S22.
- Canadian Medical Association (1999). Lifestyle modifications to prevent and control hypertension. *Canadian Medical Association Journal*, 160(9 Suppl), S1-S50.

National Institutes of Health (2003). The seventh report of the Joint National Committee: Prevention, detection, evaluation and treatment of high blood pressure. JNC 7. Retrieved [Electronic Version] from: www.nhlbi.nih.gov/guidelines/hypertension/express.pdf

Scottish Intercollegiate Guidelines Network (2001). Hypertension in older people: A national clinical guideline. Retrieved [Electronic Version] from: www.sign.uk

Williams, B., Poulter, N., Brown, M., Davis, M., McInnes, G., Potter, J. et al. (2004). Guidelines for management of hypertension: Report of the fourth working party of the British Hypertension Society, 2004 – BHS IV. *Journal of Human Hypertension*, 18(3), 139-185.

The 2005 Canadian Hypertension Education Program (CHEP) recommendations were not included in the AGREE review as they were not yet published; however the panel determined that this document was to be included as one of the foundation guidelines:

Canadian Hypertension Society, 2005 (CHEP, 2005):

- Canadian Hypertension Society (2005). The 2005 Canadian Hypertension Program Recommendations. Retrieved [Electronic Version] from: www.hypertension.ca/recommend_body2.asp
- Hemmelgarn, B., McAlister, F., Myers, M., McKay, D., Bolli, P., Abbott, C. et al. (2005). The 2005 Canadian Hypertension Education Program recommendations for the management of hypertension: Part 1 – Blood pressure measurement, diagnosis and assessment of risk. *Canadian Journal of Cardiology*, 21(8), 645-656.
- Khan, N., McAlister, F., Lewanczuk, R., Touyz, R., Padwal, R., Rabkin, S., et al. (2005). The 2005 Canadian Hypertension Education Program recommendations for the management of hypertension: Part II – Therapy. *Canadian Journal of Cardiology*, 21(8), 657-672.

The panel members divided into subgroups to undergo specific activities using the short listed guidelines, evidence summaries, studies, and other literature for the purpose of drafting recommendations for nursing interventions. This process resulted in the development of practice, education and organization and policy recommendations. The panel members as a whole reviewed the first draft of recommendations, discussed gaps, reviewed the evidence and came to consensus on a final set of recommendations.

This draft was submitted to a set of external stakeholders for review and feedback – an acknowledgement of these reviewers is provided at the front of this document. Stakeholders represented various healthcare professional groups, clients and families, as well as professional associations. External stakeholders were provided with specific questions for comment, as well as the opportunity to give overall feedback and general impressions. Subsequent to stakeholder review, the Canadian Hypertension Education Program (CHEP) Executive Committee reviewed the guideline and endorsed the recommendations.

The feedback from stakeholders was compiled and reviewed by the development panel – discussion and consensus resulted in revisions to the draft document prior to publication and evaluation.

Definition of Terms

Adherence: Adherence, the extent to which a client's behaviour (taking medication, following a diet, modifying habits or attending clinics) coincides with healthcare giver advice, is the single most important modifiable factor that compromises treatment outcome (Haynes et al., 2002; WHO, 2003). The term adherence is intended to be non judgemental, a statement of fact rather than of blame of the prescriber, client or treatment.

Blood pressure: Blood pressure is the product of the amount of blood pumped by the heart each minute (cardiac output) and the degree of dilation or constriction of the arterioles (systemic vascular resistance). It is a complex variable involving mechanisms that influence cardiac output, systemic vascular resistance, and blood volume. Hypertension is caused by one or several abnormalities in the function of these mechanisms or the failure of other factors to compensate for these malfunctioning mechanisms (Woods, Motzer & Bridges, 2005).

Systolic Pressure: Systolic pressure represents the pressure when the heart contracts and forces blood into the blood vessels. This is the higher of the two numbers and is usually expressed first (HSFO, 2005a).

Diastolic Pressure: Diastolic pressure represents the pressure when the heart is relaxed. This is the lower of the two numbers and is usually expressed second (HSFO, 2005a).

Clinical Practice Guidelines or Best Practice Guidelines: Systematically developed statements to assist practitioner and client decisions about appropriate healthcare for specific clinical (practice) circumstances (Field & Lohr, 1990).

Consensus: A process for making policy decisions, not a scientific method for creating new knowledge. Consensus development makes the best use of available information, be that scientific data or the collective wisdom of the participants (Black et al., 1999).

Education Recommendations: Statements of educational requirements and educational approaches/strategies for the introduction, implementation and sustainability of the best practice guideline.

Hypertension: A medical condition in which blood pressure is consistently above the normal range (HSFO, 2005a).

Classifications of Hypertension (WHO/ISH)*

CATEGORY	SYSTOLIC	DIASTOLIC
Optimal	<120	<80
Normal	<130	<85
High-Normal	130-139	85-89
Grade 1 (Mild Hypertension)	140-159	90-99
– Subgroup: borderline	140-149	90-94
Grade 2 (Moderate Hypertension)	160-179	100-109
Grade 3 (Severe Hypertension)	≥180	≥110
Isolated Systolic Hypertension (ISH)	≥140	< 90
– Subgroup: borderline	140-149	< 90

Reproduced with permission. *World Health Organization – International Society of Hypertension, 1999.

Another classification taxonomy described in the literature is presented by the National Institutes of Health (2003):

CATEGORY	SYSTOLIC	DIASTOLIC
Optimal	<120	<80
Pre-hypertensive	120-139	80-89
Hypertensive	≥140	≥90
■ Stage 1	140-159	90-99
■ Stage 2	≥160	≥100

Meta-analysis: The use of statistical methods to summarize the results of independent studies, therefore providing more precise estimates of the effects of healthcare than those derived from the individual studies included in a review (Alderson, Green & Higgins, 2004).

Organization and Policy Recommendations: Statements of conditions required for a practice setting that enables the successful implementation of the best practice guideline. The conditions for success are largely the responsibility of the organization, although they may have implications for policy at a broader government or societal level.

Practice Recommendations: Statements of best practice directed at the practice of healthcare professionals that are ideally evidence based.

Randomized Controlled Trials: Clinical trials that involve at least one test treatment and one control treatment, concurrent enrollment and follow-up of the test- and control-treated groups, and in which the treatments to be administered are selected by a random process.

Stakeholder: An individual, group, or organization with a vested interest in the decisions and actions of organizations who may attempt to influence decisions and actions (Baker et al., 1999). Stakeholders include all individuals or groups who will be directly or indirectly affected by the change or solution to the problem.

Systematic Review: An application of a rigorous scientific approach to the preparation of a review article (National Health and Medical Research Council, 1998). Systematic reviews establish where the effects of healthcare are consistent and research results can be applied across populations, settings, and differences in treatment (e.g., dose); and where effects may vary significantly. The use of explicit, systematic methods in reviews limits bias (systematic errors) and reduces chance effects, thus providing more reliable results upon which to draw conclusions and make decisions (Alderson, Green & Higgins, 2004).



Background Context

Hypertension is a complex, chronic condition that is often referred to as the “silent killer”. As clients are often asymptomatic, detection and treatment delays may occur which may result in the development of target organ damage and other debilitating complications. Hypertension is a major public health concern in Canada and internationally. The overall prevalence of hypertension (defined as blood pressure > 140/90 mmHg) for Canadians aged 18-74 is 21% according to the Canadian Heart Health Survey, and prevalence is known to rise progressively with age (Joffres et al., 2001). The Heart and Stroke Foundation of Ontario estimates that more than 2.4 million or 22% of Ontarians have hypertension.

The pathophysiology of hypertension is complex and much is still unknown about the underlying causes of the condition. In a small number of individuals (between 2 and 5%), hypertension is attributable to secondary causes such as renal or adrenal disease. In the vast majority of individuals, however, no clear identifiable cause is found and the condition is labelled “essential” hypertension (Beevers et al., 2001). Research has shown that there are a number of interrelated factors that contribute to elevated blood pressure including salt intake, obesity, insulin resistance, the renin-angiotensin system and the sympathetic nervous system. In recent years, other factors have been evaluated, including genetics, endothelial dysfunction, low birth weight and intrauterine nutrition, as well as neurovascular abnormalities (Beevers et al., 2001).

Hypertension: Cardiovascular and Cerebrovascular Disease

Data from numerous observational epidemiological studies have provided persuasive evidence of a direct relationship between high blood pressure and cardiovascular disease (Pickering et al., 2005). High blood pressure increases the risk of ischemic heart disease 3-to-4 fold and of overall cardiovascular risk by 2-to-3 fold. The incidence of stroke increases approximately 8-fold in persons with definite hypertension. It has been estimated that 40% of cases of acute myocardial infarction or stroke are attributable to hypertension (WHO, 2003). Pickering et al. (2005) report on a recent meta-analysis that aggregated data across 61 prospective observational studies and found that there were strong, direct relationships between hypertension and vascular mortality. These relationships were evident in the middle and older aged individuals. Cardiovascular mortality was found to increase progressively throughout the range of blood pressures including the pre-hypertensive range (NIH-JNC7 designation of 120/80-139.89 mmHg) (Pickering et al., 2005).

Hypertension accelerates atherosclerosis and blood vessel injury, increasing the risk of vascular disease and subsequent end organ damage (heart, brain, kidney, eye or limbs). Atherosclerosis is a complex, diffuse, and progressive process with a variable distribution and clinical presentation that is dependent on the regional circulation involved. Factors that may influence these differences include the size and structure of the affected artery, local and regional flow, changes in microcirculatory alterations and end-organ damage. Risk factors play an important role in initiating and accelerating the process (Faxon et al., 2004).

The prevention and control of hypertension has a major impact on health, quality of life, disability and death among Canadians (Health Canada & the Canadian Coalition for High Blood Pressure Prevention and Control, 2000). Despite the availability of effective treatments, studies have shown that in many countries less than 25% of clients treated for hypertension achieve optimum blood pressure control. In Canada, for example, only 21% of clients treated for high blood pressure had their blood pressure controlled (Joffres et al., 2001). In the United Kingdom and the United States, only 7% and 30% of clients, respectively, had good control of blood pressure and in Venezuela only 4.5% of the treated clients had good blood pressure control (WHO, 2003). Over half of those individuals being treated for hypertension drop out of care entirely within a year of diagnosis, and of those who remain under medical care, only about half take at least 80% of their prescribed medications (WHO, 2003). Consequently, due to poor adherence to antihypertensive treatment, approximately 75% of clients with a diagnosis of hypertension do not achieve optimum control.

Global Risk Assessment

The Canadian Hypertension Education Program (2005) guidelines recommend that practitioners assess a client's global risk of future cardiovascular events. Several risk prediction models (e.g., The Framingham Risk Model) are available to help practitioners quantify a client's individual risk of future cardiovascular events. This risk assessment is based upon the presence of certain risk factors such as dyslipidemia, hypertension, diabetes mellitus and target organ damage. While many of these prediction tools were developed for use in specific client populations and may not be generalizable to all client populations, their use has been shown to impact client outcomes. Several of these prediction models are available online and can be accessed using the websites listed in *Appendix Q*. The CHEP 2005 guidelines also recommend that practitioners consider informing clients of their global risk as the discussion may result in an improvement in the effectiveness of risk factor modification (CHEP, 2005).

Hypertension Treatment

The treatment of hypertension should be seen as part of a global cardiovascular risk management strategy. Blood pressure control is one of several important components in an anti-atherosclerotic strategy for clients with hypertension. Other factors important in a global cardiovascular risk management plan include the following (CHEP, 2005):

- Lifestyle modifications (including dietary modifications, weight loss and exercise) are strategies that are effective in reducing blood pressure and are critical to global cardiovascular risk reduction (CHEP, 2005). Hypertension can be effectively treated and possibly prevented through lifestyle modifications.
- Consideration of both statins and acetylsalicylic acid (ASA) as part of a cardiovascular protection strategy for clients with hypertension.
- Angiotensin Converting Enzyme (ACE) inhibitors for clients with established atherosclerotic disease.
- ACE inhibitors or Angiotensin II Receptor Blockers (ARB) for clients with diabetes and kidney disease.

Hypertension can be effectively treated and possibly prevented through lifestyle modifications. Clients need to appreciate that lifestyle change is not only important to blood pressure control but it is the cornerstone of global management of many atherosclerotic risk factors (CHEP, 2005).

Adherence to Treatment Plan

Developing a client-centred treatment plan with the client that promotes adherence is a fundamental aspect of hypertension management. The consequences of inadequate adherence to long-term therapies are poor health outcomes and increased healthcare costs. Much of the care for the control of hypertension requires self-management (usually including multi-therapies), ongoing monitoring and changes in the client's lifestyle. Poor adherence to these treatment modalities places the client at risk for several life-threatening conditions if he/she is not appropriately supported by the health system. It has been shown that increasing the effectiveness of adherence interventions has a greater impact on health of the population than any improvement in specific medical treatments (WHO, 2003).

Adherence to therapy is a multifactorial issue. In the past, there has been a tendency to “blame the patient” for poor adherence. However, the ability of the client to follow the treatment plan depends on many factors. The cost of medications, for example, may significantly influence a client's adherence to the treatment plan. The CHEP 2005 recommendations are based solely on efficacy data. Individual client/provider preferences and the costs of different drug classes have not been a part of the process. The cost of prescriptions is a significant barrier for many Ontarians unless they have drug coverage through Ontario Drug Benefits, Trillium Drug Plan or third party drug plans. Cost may be a deciding factor when choosing an antihypertensive treatment plan. *Appendix C* outlines some of the costs associated with common classes of antihypertensive therapy and provides information on some programs available to assist clients with prescription costs.

Nursing Management of Hypertension Best Practice Guideline

This guideline highlights a key nursing role in detection, assessment and development of a treatment plan for clients with hypertension. The lifestyle risk factors contributing to hypertension are identified and recommendations about key assessment and management strategies are included. Information regarding the types of pharmacological treatment is outlined to serve as direction for practice, and to assist in the education of the client and family. This best practice guideline also provides a selection of theoretical frameworks that nurses can use to facilitate changes in clients' behaviour. Client adherence assessment tools are included, and interventional strategies and behavioural tools that promote adherence are outlined.

Theoretical Models and Behaviour Change

Theoretical models provide the foundation for selecting nursing interventions to support behaviour change in chronic illness. The following are selected theoretical frameworks that nurses can use to facilitate behaviour change and to promote adherence in clients with hypertension.

Stages of Change (Transtheoretical) Model

The transtheoretical model (Prochaska & DiClemente, 1983; Prochaska & Velicer, 1997; Prochaska et al., 1994), also referred to as the Stages of Change model (SOC), provides nurses with a framework for selecting interventions that correspond with each of the stages through which individuals progress as they change behaviours (Prochaska & DiClemente, 1983; WHO, 2003). The stages of change are:

1. **Precontemplation** – not considering changing behaviour in the next 6 months
 2. **Contemplation** – considering changing behaviour in the next 6 months
 3. **Preparation** – planning the change in behaviour during the next 30 days
 4. **Action** – changing behaviour
 5. **Maintenance** – successful change in behaviour for at least 6 months.
 6. **Relapse** – resumption of previous behaviours, a normal event in the process of making behaviour change.
- Refer to *Appendix D* for a more detailed summary of the Stages of Change Model.

“Stages of change outline the client’s readiness to change. The SOC model is useful for understanding and predicting intentional behaviour change. Most patients at one time or another make unintentional errors in taking their medication because of forgetfulness or misunderstanding of instructions. However, *intentional non-adherence* is a significant problem” (WHO, 2003, p.142).

Decisional Balance Model

The decisional balance model by Horne and Weinman (1999) is a framework that suggests that medication adherence is related to a client’s perceptions of the *necessity* (perceived benefits or the pros) of the medication/treatment modality and the *concerns* (perceived risks or the cons) about potential adverse effects and the way in which an individual balances these perceived risks (concerns). The decisional balance consists of identifying the pros and cons of the proposed/actual behaviour change. Research has established a “characteristic relationship between the SOC and the decisional balance model” (WHO, 2003, pg.142). The benefits/pros of the health behaviour in the early stages (i.e. precontemplation/contemplation stage) are low and increase as individuals move through the stages of change. Conversely, the cons/risks of the health behaviour change are high initially then gradually decrease and are the lowest at the maintenance stage. The perceived benefits of changing behaviour begin to outweigh the perceived risks in the preparation stage.

Clients develop their perception of treatment based on their implicit model of their illness, as well as their appraisal of the effect of the treatment relative to their expectations/prior experiences. Clients’ model of illness comprises beliefs about the etiology, perception of the symptoms, likely duration, and personal consequences. The necessity of a treatment can be influenced by these beliefs.

“The existing research on patients’ beliefs about illness and medications suggests the value of an integrated approach, which addresses patients’ perceptions of the treatment as well as the practicalities of using it. The *necessity-concerns* construct offers a method for conceptualizing the salient beliefs that need to be addressed. Patients should be provided with a clear rationale for the necessity of a particular treatment that is consonant with their own model of illness. Moreover, their specific concerns should be elicited and addressed” (Horne & Weinman, 1999, pg 493).

Self-Efficacy Model

Self-efficacy is an individual’s belief that she or he is capable of dealing with a specific problem. Low self-efficacy results in avoiding changing behaviour, whereas, high self-efficacy promotes change in behaviour (Betz & Hackett, 1998). Bandura (1977) specified four sources of information through which self-efficacy expectations are learned and by which they can be modified. These sources of information include:

1. performance accomplishments, that is, experiences of successfully performing the behaviours in question;
2. vicarious learning or modeling;
3. verbal persuasion, for example, encouragement and support from others; and
4. physiological arousal, for example, anxiety in connection with the behaviour (Betz & Hackett, 1998).

Self-Care/Self-management Model

Self-care/self-management is situation and culture specific; involves the capacity to act and make choices; is influenced by knowledge, skills, values, motivation, locus of control and efficacy; and focuses on aspects of healthcare under the control of the individual. Orem’s Self-Care Deficit Theory of Nursing (1991) delineates three main roles for nurses:

1. to compensate for a person’s inability to perform self-care by doing it for him/her;
2. to work together with the client to meet his/her healthcare needs; and
3. to support and educate the client who is learning to perform his/her own self-care in the face of illness or injury. This is the key role in facilitating clients’ adherence to maintaining self-care.

Interventions/Strategies for Change

In addition to the models and theories discussed above, there are interventions that nurses can use to facilitate behaviour change in their clients. Some examples include:

- **Motivational interviewing** – systematically directs the client toward motivation for change; offers advice and feedback when appropriate; selectively uses empathic reflection to reinforce certain processes; and seeks to elicit and amplify the client’s discrepancies about their unhealthy behaviour to enhance motivation to change (Botelho & Skinner, 1995). *Appendix E* provides details related to motivational interviewing, and examples of the application of these principles.
- **Behavioural strategies** – observable change strategies, such as simplifying medication regimens, utilizing dosettes, etc. These strategies are outlined in the practice recommendations related to promoting adherence.

Practice Recommendations

The following recommendations, based on the best available evidence, provide direction related to high blood pressure detection, client assessment and development of a collaborative treatment plan, promotion of adherence and ongoing follow-up.

Detection and Diagnosis

Nurses have an important role to play in the detection and diagnosis of hypertension. Often, nurses are responsible for obtaining, recording and reporting a client's blood pressure. They also play an important role in the provision of education to their clients, which includes sharing blood pressure results with the client and other members of the healthcare team.

Detection

Recommendation 1.1

Nurses will take every appropriate opportunity to assess the blood pressure of adults in order to facilitate early detection of hypertension.

Level of Evidence = IV

Discussion of Evidence

Hypertension is often referred to as the “silent killer.” Regular blood pressure checks are a means to assess the need for antihypertensive treatment and to monitor a client's vascular risk (Pickering et al., 2005). As the largest group of healthcare professionals, nurses work with clients in a wide range of settings and are in a key position to facilitate early detection of elevated blood pressure. CHEP (2005) recommends assessing all adult blood pressures at all appropriate visits. A specific interval for screening is not recommended, however it is suggested that checking a blood pressure in a normotensive client every 2 years and every year in the client with borderline blood pressure would be prudent (Sheridan, Pignone & Donahue, 2003).

Recommendation 1.2

Nurses will utilize correct technique, appropriate cuff size and properly maintained/calibrated equipment when assessing clients' blood pressure.

Level of Evidence = IV

Discussion of Evidence

The most frequent error in the clinic-based blood pressure assessment is the utilization of an inappropriate blood pressure cuff, with under-cuffing a large arm accounting for 84% of all errors (See Table 1) (CHEP, 2004; Graves, Bailey, & Sheps, 2003). When the cuff is correctly sized, the bladder of the cuff should encircle 80 -100% of the arm. Utilizing a blood pressure cuff that is too small may lead to a significant overestimation of blood pressure. Fonseca-Reyes et al. (2003) found that when a cuff is too small, for every 5 cm increase in arm circumference, there was a 2-5 mmHg increase in systolic blood pressure and a 1-3 mmHg increase in diastolic blood pressure. In contrast, use of a cuff that is too large leads to an underestimation of blood pressure.

Regular calibration of aneroid and electronic blood pressure monitors is required in order to ensure that blood pressure measurements begin from a starting point of zero. Monitors can drift from a zero starting point due to use and over inflation, resulting in potentially inaccurate blood pressure readings. Monitors

are manufactured with instructions for calibration, which should be utilized to develop a maintenance schedule and procedure. CHEP (2005) recommends that aneroid devices should be calibrated every 6-12 months.

Table 2 provides a description of the appropriate technique for measuring blood pressure, and Figure 1 illustrates proper positioning of a blood pressure cuff.

Table 1: Appropriate cuff sizing based on arm circumference

Reproduced with permission. Canadian Hypertension Education Program Process, 2005.

Arm circumference (cm)	Size of cuff (cm)
18-26	9x18 (child)
26-33	12x23 (standard adult)
33-41	15x33 (large, obese)
More than 41	18x36 (extra large, obese)

⇒ **Practice Point:**

- The client should be seated comfortably for five minutes with the back supported and the upper arm bared without constrictive clothing. The legs should not be crossed (Pickering et al., 2005).
- The arm should be supported at heart level, and the bladder of the cuff should encircle at least 80% of the arm circumference (Pickering et al., 2005).
- The mercury column should be lowered at a rate of 2 to 3 mmHg/sec, and the first and last audible sounds should be taken as systolic and diastolic pressure. The column should be read to the nearest 2 mmHg (Pickering et al., 2005).
- Neither the client nor the observer should talk during the measurement (Pickering et al., 2005).
- No smoking or nicotine in preceding 15-30 min (CHEP, 2005).
- No caffeine in the preceding hour (CHEP, 2005).



Table 2: Recommended technique for measuring blood pressure using a sphygmomanometer and stethoscope

Reproduced with permission. Canadian Medical Association, 1999.

- I. Measurement should be taken with a sphygmomanometer known to be accurate. Although a mercury manometer may be preferable, a recently calibrated aneroid or a validated and recently calibrated electronic device can be used. Aneroid devices and mercury columns need to be clearly visible at eye level.
- II. Choose a cuff with an appropriate bladder width matched to the size of the arm.
- III. Place the cuff so that the lower edge is 3 cm above the elbow crease and the bladder centered over the brachial artery. The client should be resting comfortably for 5 minutes in the seated position with back support. The arm should be bare and supported with the antecubital fossa at heart level, as a lower position will result in erroneously higher systolic blood pressure and diastolic blood pressure. There should be no talking and client's legs should not be crossed. At least two measurements should be taken in the same arm with the client in the same position. Blood pressure should also be assessed after 2 minutes of standing, and at times when clients report symptoms suggestive of postural hypotension. Supine blood pressure measurements may also be helpful in the assessment of elderly in those with diabetes.
- IV. Increase the pressure rapidly to 30 mmHg above the level at which the radial pulse is extinguished (to exclude the possibility of a systolic auscultatory gap). Continue to auscultate at least 10 mmHg below phase V* to exclude a diastolic auscultatory gap.
- V. Place the bell or diaphragm of the stethoscope gently and steadily over the brachial artery.
- VI. Open the control valve so that the rate of deflation of the cuff is approximately 2 mmHg per heart beat. A cuff deflation rate of 2 mmHg per beat is necessary for accurate systolic and diastolic estimation.
- VII. Read the systolic level (the first appearance of a clear tapping sound [phase I*]). Record the blood pressure to the closest 2 mmHg on the manometer (or 1 mmHg on electronic devices) as well as the arm used and whether the client was supine, sitting or standing. Avoid digit preference by not rounding up or down. Record the heart rate. The seated blood pressure is used to determine and monitor treatment decisions. The standing blood pressure is used to assess for postural hypotension, which if present, may modify the treatment.
- VIII. If Korotkoff* sounds persist as the level approaches 0 mmHg, then the point of muffling of the sound is used (phase IV*) to indicate the diastolic pressure.

- IX. In the case of arrhythmia, additional readings may be required to estimate the average systolic and diastolic pressure. Isolated extra beats should be ignored. Note the rhythm and pulse rate.
- X. Leaving the cuff partially inflated for too long will fill the venous system and make the sounds difficult to hear. To avoid venous congestion, it is recommended that at least 1 minute should elapse between readings.
- XI. Blood pressure should be taken at least once in both arms and if an arm has a consistently higher pressure, that arm should be clearly noted and subsequently used for blood pressure measurement and interpretation.

NOTE: Some steps may not apply when using automated devices.

* For a definition of Korotkoff sounds and description of phases, refer to *Appendix B Glossary of Clinical Terms*.

Figure 1: Proper positioning of cuff for blood pressure assessment

Reproduced with permission. Canadian Hypertension Education Program Process, 2005.



Diagnosis

In order to understand the process of diagnosing hypertension, the nurse needs to be aware of the following key definitions.

Important Blood Pressure Definitions:

Blood Pressure: measure of the pressure or force of the blood against the walls of the blood vessels. The pressure is measured in millimeters of mercury (mmHg) (HSFOa, 2005).

Blood pressure is the product of the amount of blood pumped by the heart each minute (cardiac output) and the degree of dilation or constriction of the arterioles (systemic vascular resistance). It is a complex variable involving mechanisms that influence cardiac output, systemic vascular resistance, and blood volume (Woods et al., 2005).

Hypertension or High Blood Pressure: medical condition in which blood pressure is consistently above the normal range (HSFOa, 2005).

Hypertensive Emergency: may present as an asymptomatic elevation in blood pressure with a diastolic reading >130, or a systolic reading of >200 (CHEP, 2004). For details related to hypertensive emergencies, refer to *Appendix G*.

Isolated Systolic Hypertension: As adults age, systolic blood pressure tends to rise, and diastolic tends to fall. When the systolic is ≥ 140 , and the diastolic is < 90 , the individual is classified as having isolated systolic hypertension (Pickering et al., 2005).

Primary, Idiopathic or Essential Hypertension: persistent and pathological high blood pressure for which no specific cause can be found (HSFOa, 2005).

Secondary Hypertension: hypertension that is caused by another disease. About 5 to 10% of cases of high blood pressure are caused by medical problems such as heart or kidney disease, or as a side effect of medication (HSFOa, 2005).

Target Organ Damage: subclinical vascular lesions and/or functional deterioration of the major target organs (e.g., brain, eye fundus, heart, conduit arteries and kidneys) (Birkenhager & deLeeuw, 1992; Cuspidi et al., 2000).

White Coat Hypertension: term used to denote individuals who have blood pressures that are higher than normal in the medical environment, but whose blood pressures are normal when they are going about their daily activities (Verdecchis, Staessen, White, Imai & O'Brien, 2002). The diagnosis of white coat hypertension can be determined through the use of ambulatory and/or self-home monitoring of blood pressure. The risk of future cardiovascular disease events is less in individuals with white coat hypertension than in those with higher than normal ambulatory blood pressures (Verdecchis et al, 2002).

Recommendation 1.3

Nurses will be knowledgeable regarding the process involved in the diagnosis of hypertension.

Level of Evidence = IV

Discussion of Evidence

Although nurses are not directly responsible for establishing a diagnosis of hypertension, they require knowledge of the process in order to participate in, expedite and support the client through the diagnosis phase.

Previous Canadian recommendations outlined a process to diagnose hypertension that included up to 6 office visits over a 6-month period of time. The 2005 Canadian Hypertension Guidelines (CHEP, 2005) place new emphasis on expediting the diagnosis of hypertension. This is in response to recent studies that indicated the benefits of early recognition and early treatment of hypertension in terms of reducing hypertension related complications. Based on the CHEP 2005 recommendations, a diagnosis of hypertension can now be made in one, two or three visits based on the algorithm found in Figure 2.

In summary, these recommendations state that:

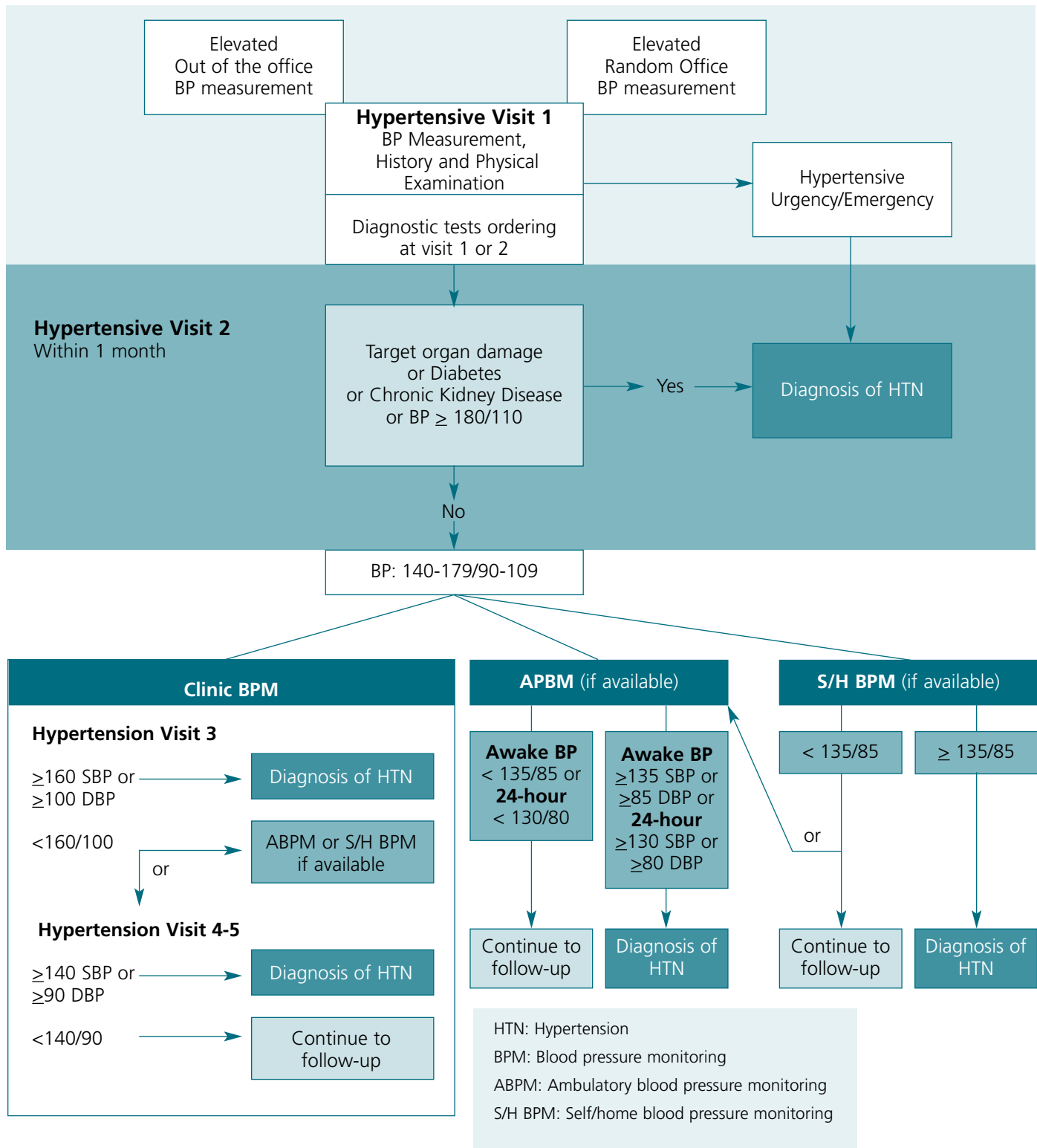
- For clients with hypertensive urgencies/emergencies a diagnosis of hypertension can be made at an initial visit where hypertension is comprehensively assessed.
- For clients with one of the following:
 - a) target organ damage
 - b) chronic kidney disease
 - c) diabetes mellitus or
 - d) BP \geq 180/110a diagnosis of hypertension can be made on the second visit made to assess blood pressure.
- For clients with BP \geq 160-179/100-109 (and not already diagnosed based on the criteria outlined above), a diagnosis can be made at the third visit.

In this diagnostic algorithm, preliminary visits where elevated blood pressures are noted (but in the absence of any specific assessment for the causes of hypertension or for hypertensive complications) would not be considered as an “initial” hypertension-related visit.

Although office/clinic-based measurement has remained the “gold standard” for the diagnosis of hypertension, the most recent evidence suggests that, when properly assessed, self/home (refer to Figure 3) and ambulatory blood pressure monitoring (ABPM – refer to Figure 4) are as, or more effective in facilitating a diagnosis of hypertension (CHEP, 2005). As a result, the 2005 CHEP recommendations now encourage practitioners to use any or all of the three validated monitoring technologies, office/clinic-based measurement, self/home and ambulatory blood pressure monitoring (alone or in combination), to make a diagnosis of hypertension.

**Figure 2: The expedited assessment and diagnosis of patient with hypertension:
Focus on validated technologies for blood pressure assessment**

Reproduced with permission. Canadian Hypertension Education Program Process, 2005.



Recommendation 1.4

Nurses will educate clients about self/home blood pressure monitoring techniques and appropriate equipment to assist in potential diagnosis and the monitoring of hypertension.

Level of Evidence = IV

Discussion of Evidence

Self/home blood pressure monitoring involves the client's self-measurement of blood pressure. While this technology is now recognized as playing an important role in the diagnosis of hypertension it must be used by educated clients and requires the use of validated and properly calibrated equipment (CHEP, 2005).

The cost of a monitor is approximately \$80-\$140 (HSFOb, 2005) and they can be purchased at pharmacies and medical supply stores. Clients should be advised to purchase devices that are appropriate for the individual (e.g., correct cuff size) and have been tested for accuracy using a recognized validation protocol. Figure 3 provides details regarding points to consider when purchasing and using a self/home blood pressure monitor. Refer to *Appendix B – Glossary of Clinical Terms*, for details regarding validation protocols.

Community-based Self Monitoring Devices

Community-based self monitoring devices are available in many public locations, including grocery chains and pharmacies. Clients may ask nurses and other health professionals if these devices can be used for self measurement of blood pressure. At present, there are no published protocols or minimum standards for community-based evaluations of automated blood pressure measuring devices designed for community use (Lewis, Boyle, Magharious & Myers, 2002). Community-based automated devices are not recognized in the current diagnostic algorithm for hypertension nor are they included in the recommendations for self blood pressure monitoring. The Vita-Stat 90550, an automated device located in approximately 3,000 Canadian community settings, did not meet the BHS or AAMI criteria for accuracy during testing in a research study (Lewis et al., 2002). Other potential problems with community based devices are that the cuff size (22 x 33 cm) is inadequate for clients with large arms and the devices are not labeled to show when and if there has been recent maintenance and revalidation of the device's performance (Pickering et al., 2005). Further research is needed to validate these devices before they will be endorsed for diagnosis and monitoring of blood pressure in routine practice.

Figure 3: Important points about self/home blood pressure monitoring

Considerations when purchasing a monitor:

- The cost of the monitor is usually between \$80-140.
- Choose a device that meets the standards of the Association for Advancement of Medical Instrumentation (AAMI), the British Hypertension Society (BHS) or International Protocol (IP). Look for this trademark symbol* on the package.



*Endorsed by the Canadian Coalition for the Prevention and Control of Hypertension

- Choose the right cuff size – the bladder of the cuff should cover 80% of the upper arm.
- To increase the reliability of reported self/home blood pressure values, purchase devices that automatically record data.
- Ask a healthcare professional if you require assistance.

Important points about measuring blood pressure at home:

- Clients should read the instructions that come with the monitor carefully.
- Clients should be observed to ensure that blood pressure is measured correctly. Inform clients of the following:
 - No smoking or nicotine 15-30 minutes before taking blood pressure.
 - No caffeinated beverages one hour before taking blood pressure.
 - Rest for 5 minutes before taking blood pressure.
 - Sit up straight with the back supported. The arm should be supported so the elbow is just below heart level.
 - Never cross the legs when measuring blood pressure.
 - Do not talk while measuring blood pressure.
 - Check blood pressure twice in the morning (before taking medications) and twice in the evening for seven consecutive days.
 - Bring blood pressure device and record with you to your next appointment.
- Stable, normotensive clients should check blood pressures for a one-week period every 3 months. Persons with diabetes, or clients having difficulty following a treatment plan, should check their blood pressure more frequently.
- Home monitors should be checked annually against a device of known calibration. This would require a visit to the clinic to have a blood pressure check using the home equipment and calibrated clinic equipment for the purposes of comparison.
- Self/home BP values $\geq 135/85$ mmHg should be considered elevated and associated with increased overall mortality risk similar to clinic readings $>140/90$ mmHg. In an asymptomatic client, a blood pressure $>200/130$ mmHg is a medical emergency and the client should seek immediate medical attention.

CHEP, 2004; HSFOb, 2005

Refer to *Appendix F* for a client education resource regarding the selection and use of a home blood pressure monitor.

Ambulatory Blood Pressure Monitoring (ABPM)

Ambulatory Blood Pressure Measurement (ABPM) involves the client wearing a portable blood pressure monitor for a 24-hour period to measure and record blood pressure at regular intervals. In addition to its role in expediting a diagnosis of hypertension, CHEP (2004) recommends that ABPM be considered when an office-based increase in blood pressure (“white coat hypertension”) is suspected in:

- Untreated clients with mild (140-159/90-98) to moderate (160-179/100-109) clinic-based hypertension, in the absence of target organ damage.
- Treated clients with:
 - a) blood pressure that is not below target despite receiving appropriate therapy;
 - b) symptoms suggestive of hypotension;
 - c) fluctuating clinic-based pressure readings.

An average daytime APBM of 135/85 mmHg is considered to be the equivalent of an office-based measurement of 140/90 mmHg (CHEP 2005). While ABPM is usually lower during the nighttime, a decrease in nocturnal blood pressure of less than 10% is associated with increased risk of cardiovascular events (CHEP 2004).

There is growing evidence that office-measured sphygmomanometer-based blood pressures are not as reliable as ABPM in terms of predicting cardiovascular events such as MI, CHF, stroke and TIA, as well as other target organ damage such as ventricular hypertrophy (Beckett & Godwin, 2005). Despite its clinical utility and the 2005 CHEP recommendations endorsing its use in the diagnosis of hypertension, ABPM can be difficult to obtain as it is not available in every community. The Ontario Ministry of Health and Long-Term Care does not currently cover the testing under its Schedule of Benefits and clients or third party payers may have to pay \$50-75 for ABPM.

A recent study examined the clinical utility of the BpTRU automated blood pressure monitor in the diagnosis and monitoring of hypertension in the primary care clinic setting to determine how it related to ABPM measurement (Beckett & Godwin, 2005). The BpTRU monitor is an automated device that has been developed specifically for use in the clinician's office. It takes an initial blood pressure reading while the clinician is present and then, when the client is alone, take five more measurements several minutes apart and averages them. The BpTRU (model BPM 100), has been tested in non treatment settings and has been shown to partially eliminate the “white coat effect”. A similar finding was observed in a study that compared the BpTRU with measurements taken by a trained research technician under similar conditions (Myers & Valdivieso, 2003). Beckett and Godwin (2005) found that while the BpTRU did not have the sensitivity and specificity compared to ABPM, the device has the potential to be used in the clinic setting to help overcome the white coat effect without the cost of having to conduct frequent 24 hour ABPM. Further research is needed to examine these automated devices in routine clinical practice.

Figure 4: Ambulatory Blood Pressure Measurement (ABPM)

When ABPM is ordered, the client wears a portable blood pressure monitor for a 24-hour period and the blood pressure is measured and recorded at regular intervals.

CHEP (2004) recommends ABPM be considered when “white coat hypertension” is suspected in:

- Untreated clients with mild (140-159/90-99) to moderate (160-179/100-109) clinic-based hypertension, in the absence of target organ damage.
- Treated clients with:
 - a) Blood pressure that is not below target despite receiving appropriate therapy;
 - b) Symptoms suggestive of hypotension;
 - c) Fluctuating clinic-based pressure readings.

An average daytime APBM of 135/85 mmHg is considered to be the equivalent of an office-based measurement of 140/90 mmHg (CHEP 2005). A decrease in nocturnal blood pressure of less than 10% is associated with increased risk of cardiovascular events (CHEP, 2004).

Clients with normal blood pressure on 24 hour monitoring have a prognosis similar to those with normal office blood pressure (CMA, 1999).

Recommendation 1.5

Nurses will educate clients on their target blood pressure and the importance of achieving and maintaining this target.

Level of Evidence = IV

Discussion of Evidence

Target blood pressure is individualized and dependent upon co-morbid conditions, and is established in collaboration with the healthcare team. Table 3 describes the threshold for treatment and target blood pressure based on co-existing medical conditions. Failure to reach target blood pressure may result in target organ damage, and increased morbidity and mortality.

It is the consensus of the development panel that nurses contribute to the education of clients about target blood pressure, and the importance of maintaining that target.

Table 3: Threshold for Initiation of Treatment and Target Values for Blood Pressure

Reproduced with permission. Canadian Hypertension Education Program Process, 2005.

Condition	Initiation of Treatment (SBP/DBP mmHg)	Target (SBP/DBP mmHg)
Diastolic \pm systolic hypertension	$\geq 140/90$	$< 140/90$
Isolated systolic hypertension	SBP > 160	< 140
Diabetes	$\geq 130/80$	$< 130/80$
Renal Disease	$\geq 130/80$	$< 130/80$
Proteinuria $> 1\text{gm/day}$	$\geq 125/75$	$< 125/75$

The practice recommendations that follow throughout the rest of this document are directed at the care of adult clients after a diagnosis of hypertension has been established.

Assessment and Development of a Treatment Plan

Lifestyle Interventions

Recommendation 2.1

Nurses will work with clients to identify lifestyle factors that may influence hypertension management, recognize potential areas for change and create a collaborative management plan to assist in reaching client goals, which may prevent secondary complications. *Level of Evidence = IV*

Lifestyle Factors impacting on blood pressure

- Diet
- Weight
- Exercise
- Alcohol consumption
- Smoking
- Stress

Discussion of Evidence

Lifestyle modifications are the cornerstone of both antihypertensive and antiatherosclerotic therapy today. A combination of lifestyle interventions is often needed to achieve optimal blood pressure values to reduce the risk of heart attack and stroke. Their effectiveness, in conjunction with pharmacological therapies in the prevention and initial management of hypertension has been well documented in the literature (CHEP, 2005; NIH, 2003; SIGN, 2001; Williams et al., 2004). Diet, weight, exercise, smoking, alcohol consumption and stress are all important lifestyle factors that can have an impact on blood pressure and cardiovascular health. Assessment and modification of these risk factors, where appropriate, is effective in reducing hypertension. In appropriately selected individuals, some lifestyle interventions have the potential to decrease blood pressure levels to the equivalent of a half to one standard dose of an antihypertensive drug (CHEP, 2005). A team-based approach is needed to influence and reinforce goals and ensure adherence. Nurses have a unique opportunity to help clients examine their lifestyle, recognize risks and potential areas for change, advise on a focused individualized plan and facilitate the accomplishment of their goals.

The following table depicts the positive effects on blood pressure when lifestyle modifications are made:

Table 4: Impact Of Lifestyle Therapies On Blood Pressure In Hypertensive Adults

Reproduced with permission. Canadian Hypertension Education Program Process, 2005.

Intervention	Targeted change	Change in blood pressure (systolic/diastolic) mmHg
Sodium intake	-100 mmol/day	-5.8/-2.5
Weight	-4.5 kg	-7.2/-5.9
Alcohol intake	-2.7 drinks/day	-4.6/-2.3
Exercise	3 times/wk	-7.4/-5.8
Dietary patterns	DASH diet	-11.4/-5.5

In order to accomplish these tasks, nurses in hospitals and the community must remain current regarding changes to evidence-based practice related to hypertension, cardiovascular risk factors and management. Opportunities to identify high blood pressure and educate individuals and/or groups occur in many settings, including the workplace, family practice offices, public health visits and nurse-managed clinics. By taking advantage of these “teachable moments” and providing follow-up counseling and support, nurses promote partnerships with clients, families and the rest of the healthcare team.

Relationships are built on trust, respect and a holistic knowledge of the client and their social support network. Information from a client’s history, including previous experiences with the healthcare system, cultural beliefs and current knowledge of their health issues is integral to executing a care plan (NIH, 2003). A client’s attitudes must be appreciated and explored in order to educate and increase communication. Tools such as the Stages of Change Model (*Appendix D*) and strategies such as those used in motivational interviewing (*Appendix E*), assist nurses, in collaboration with clients, plan care and facilitate behavioural change (Steptoe et al., 1999). Plans must be individualized to achieve results – management strategies need to focus on the client’s goals, be tailored to his/her lifestyle and provide positive reinforcement and advice with each encounter.

The following recommendations for individual lifestyle changes will assist nurses in incorporating best practice strategies to effect positive change.

Diet

Recommendation 2.2

Nurses will assess for and educate clients about dietary risk factors as part of management of hypertension, in collaboration with dietitians and other members of the healthcare team.

Level of Evidence = IV

Recommendation 2.3

Nurses will counsel clients with hypertension to consume the DASH Diet (Dietary Approaches to Stop Hypertension), in collaboration with dietitians and other members of the healthcare team.

Level of Evidence = Ib

Recommendation 2.4

Nurses will counsel clients with hypertension to limit their dietary intake of sodium to the recommended quantity of 65-100 mmol/day, in collaboration with dietitians and other members of the healthcare team.

Level of Evidence = Ia

Discussion of Evidence

Nurses, in collaboration with other members of the healthcare team, play a role in assessment and client education related to dietary risk factors and optimal dietary approaches. By conducting an assessment of the client's current eating habits before providing dietary advice and referring to a Registered Dietitian for dietary counseling, nurses can assist in the identification and education of dietary risk factors. Using a "food diary" or a tracking form can facilitate this assessment (See *Appendix J*). Nurses understand that social and cultural factors play an important role in adherence, and that there are multiple dietary approaches to the management of hypertension. A referral to a Registered Dietitian will assist with the complexities of individual client needs.

Research has shown that following a diet that emphasizes fruits, vegetables and low-fat dairy products that is reduced in fat and cholesterol (CHEP, 2004; Moore et al., 1999; Pickering et al., 2005) and reducing the amount of sodium consumed can both reduce the risk of developing high blood pressure and lower an already elevated blood pressure (Conlin, 1999; Ketola, Sipila, Makela, 2000; Moore et al., 1999). Research shows the DASH eating plan with reduced sodium intake has reduced mild hypertension by 11.5/5.7 mmHg (systolic/diastolic), which is equivalent to the changes seen with antihypertensive medications.

The Dietary Approaches to Stop Hypertension (DASH) diet emphasizes fruits, vegetables, and low-fat dairy products, as well as a reduced sodium intake diet. This approach has significantly lowered blood pressure in persons with stage 1 (grade 1) hypertension and in those with high-normal blood pressure (Appel, Moore & Obarzanek, 1997; Conlin, 1999; Vollmer et al., 2001). The DASH diet also lowers blood pressure in those with isolated systolic hypertension (Moore, Conlin, Ard & Sveykey, 2001; Moore et al., 1999). These important findings confirm the effects of a reduced salt intake on blood pressure, as well as showing an additive effect between decreased salt intake and the DASH diet.

Evidence from a systematic review examining the effect of sodium on blood pressure showed that a low sodium diet helps in maintenance of lower blood pressure following withdrawal of antihypertensive medications. Measures taken at 13 and 60 months showed that those participants given advice about a low sodium diet had reduced systolic and diastolic blood pressures compared with participants in the control group. The degree of reduction in sodium intake and change in blood pressure were not related; people on antihypertensive medications were able to stop their medication more often on a reduced sodium diet as compared with controls, while maintaining similar blood pressure control (Hooper, Bartlett, Davey & Ebrahim, 2004). The Canadian Hypertensive Education Program (2005) recommends that sodium intake in hypertensive individuals be limited to 65-100 mmol/day, which is the equivalent of 1500-2400 milligrams or 2/3-1 tsp of table salt (CHEP, 2005).

Limit sodium to 65-100 mmol/day, which is the equivalent of 2/3-1 tsp of table salt (CHEP, 2005).
100 mmol Na = 2400 mg = 1 tsp (6 grams) table salt

Strategies to reduce salt intake may include (CMA, 1999):

- selecting foods low in salt (fresh fruits and vegetables);
- avoiding processed foods;
- refraining from adding salt at the table;
- minimizing the use of salt in cooking; and
- awareness of the salt content in food eaten in restaurants.

Appendix I provides strategies for identifying and decreasing sodium in the diet.

While there is no clear correlation with elevated blood pressure, scientific evidence shows that the consumption of trans fat increases the incidence of coronary artery disease. The Heart and Stroke Foundation of Canada recommends that trans fat in processed foods be replaced as soon as possible, where feasible, by healthy alternatives such as monounsaturated and polyunsaturated fats, rather than with equal amounts of saturated fats (Svetkey et al., 2004; Vasan, Beiser & Seshadri, 2002). Caffeine is a powerful stimulant to the cardiovascular system, and the effects of drinking one cup of coffee are an increase in blood pressure and heart rate. It has been suggested that regular consumption of caffeine may contribute to a sustained elevation in blood pressure, which is a concern for those with hypertension (Jee, He, Whelton, Suh & Klag, 1999; Lane, Pieper, Phillips-Bute, Bryant & Kuhn, 2002).

Refer to the following Appendices for resources related to diet and hypertension:

- *Appendix H* – Dietary Approaches to Stop Hypertension (DASH) Diet
- *Appendix I* – Reducing Sodium and DASH
- *Appendix J* – Recording Food Habits and DASH
- *Appendix Q* – Educational Resources

Healthy Weight

Recommendation 2.5

Nurses will assess clients' weight, Body Mass Index (BMI) and waist circumference.

Level of Evidence = IV

Recommendation 2.6

Nurses will advocate that clients with a BMI greater than or equal to 25 and a waist circumference over 102 cm (men) and 88 cm (women) consider weight reduction strategies. *Level of Evidence = IV*

Body Mass Index is calculated as follows:

$$\begin{array}{c} \text{Weight in kilograms divided by height in metres squared} \\ \text{or} \\ \text{BMI} = \text{weight(kg)/height(m)}^2 \end{array}$$

Waist circumference should be measured at the point of the torso located midway between the lowest rib and the iliac crest (Health Canada, 2005).

Discussion of Evidence

Among Canadian adults younger than 55 years of age, the prevalence of hypertension is a least 5-fold higher for those with a BMI greater than 30 than for those with a BMI less than 20 (CMA, 1999). Maintenance of a healthy BMI (18.5-24.9 kg/m²) is recommended for hypertensive clients to reduce blood pressure (CHEP, 2004). Keeping the waist circumference below 102 cm for males, and 88 cm for females will also reduce the possibility of becoming hypertensive (CHEP 2005).

BMI and waist circumference should be used as one part of a more comprehensive assessment of health risk. Both BMI and waist circumference are easy to perform bedside measures (Douketis, Lemieux, Paquette, & Mongue, 2005). BMI and waist circumference should be assessed as part of a routine physical examination. Bodyweight classification can be applied to all ethnic groups in Canada; however healthcare providers should be aware of limitations in applying this classification to non-white people. A recent study involving Asian people suggested that BMI cutoffs of over weight and obesity should start at 23 kg/m² (Douketis, Paradis, Keller & Martineau, 2005).

Central obesity, detected by waist circumference, is a marker of adverse cardiovascular outcomes (Williams et al., 2004) and is associated with metabolic syndrome. Central obesity has been defined by waist circumferences for various populations (International Diabetes Federation, 2005). The consensus panel of the International Diabetes Federation, who summarized these pragmatic cut-points, acknowledges that they were taken from a variety of sources, and require better data to link them to risk:

- Euroid: ≥94cm for men and ≥80 cm for women;
- South Asian (Chinese, Malay and Asian-Indian populations): ≥90 cm for men and ≥80 cm for women;

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- Ethnic South and Central Americans: use South Asian recommendations until more specific data are available;
- Sub-Saharan Africans: use European data until more specific data are available;
- Eastern Mediterranean and Middle East populations: use European data until more specific data are available.

Increased peripheral concentrations of insulin and increased triglyceride concentration is associated with abdominal obesity, and may be due to the direct deposition of free fatty acids in the portal vein from intra-abdominal adipocytes (Bronner, Kanter & Manson, 1995). The benefits of weight loss include: reducing the cost and side effects associated with antihypertensive medications, lowering cholesterol levels, decreasing glucose levels in individuals with diabetes, decreasing cardiovascular risks, and finally, improving clients' quality of life.

Metabolic syndrome is a constellation of cardiovascular risk factors related to hypertension, abdominal obesity, dyslipidemia and insulin resistance (NIH, 2003). According to a recent definition of the International Diabetes Federation (2005), for a person to be defined as having metabolic syndrome, they must have central obesity plus any two or more of the following:

- Raised triglyceride level: >150mg/dl (1.7 mmol/L), or specific treatment for this lipid abnormality;
- Reduced HDL cholesterol <40 mg/dl (0.9 mmol/L) in males and, 50 mg/dl (1.1 mmol/L) in females, or specific treatment for this lipid abnormality;
- Raised blood pressure: Systolic BP >130 or diastolic BP>85 mmHg, or treatment of previously diagnosed hypertension;
- Raised fasting plasma glucose >100 mg/dL (5.6 mmol/L), or previously diagnosed type 2 diabetes. If above 5.6 mmol/L or 100 mg/dL, an oral glucose tolerance test is strongly recommended but not necessary to define the presence of this syndrome.

Weight reduction by calorie restriction is appropriate for the majority of hypertensive clients because many are overweight (Williams et al., 2004). If the weight loss goal is a total of 20 pounds, allowing five months for the weight loss is realistic, sensible and safe (HSFO, 2001). Various studies have examined the impacts of weight loss on blood pressure:

- Low calorie diets have a modest effect on blood pressure in overweight individuals, but nearly 50% can expect a reduction of 5/5 mmHg or better in the short term (Williams et al., 2004).
- Per kilogram of weight loss has been associated with a reduction in systolic and diastolic blood pressure of 1.05 mmHg. Larger reductions in blood pressure were achieved in populations that included subjects taking antihypertensive medications. In a multivariate analysis, which was standardized for the amount of weight loss, the effect on diastolic blood pressure was larger when body weight was reduced by physical activity compared with energy restriction (Neter, Stam, Kok, Grobbee & Geleijnse, 2003).
- A weight loss of 4.5 kg is associated with a reduction of systolic/diastolic blood pressure of 7.2/5 mmHg (CHEP, 2004).
- In overweight clients, the efficacy of weight loss in reducing blood pressure is similar to that of single antihypertensive drug therapy. Overweight hypertensive clients receiving antihypertensive medications should be advised to lose weight for additional antihypertensive effect (CMA, 1999).
- In the Framingham study, for each 4.5 kg of weight gain there was an associated increase in systolic blood pressure of 4 mmHg in both men and women (CMA, 1999).

Weight loss strategies should include a multidisciplinary approach including dietary education, increased physical activity and behavior modification. Registered dietitians are especially well positioned to assess the needs of the client with hypertension and often other underlying nutrition conditions, develop care plans that take into consideration multiple nutrition issues, use different counseling and behavioural change techniques to effect difficult lifestyle changes and monitor treatment and management strategies.

Sympathomimetic appetite suppressants are still available, but may be associated with increased blood pressure and have limited effectiveness in reducing weight (CMA, 1999). Adherence to the weight loss program can be encouraged through education, correcting misconceptions, enhancing family and social support and frequent counseling and monitoring (Hamlin & Brown, 1999). Refer to further sections in this document for a detailed discussion of strategies to promote adherence, and to *Appendix K* for a description of the Canadian Body Weight Classification System.

Exercise

Recommendation 2.7

Nurses will assess clients' current physical activity level.

Level of Evidence = IV

Recommendation 2.8

Nurses will counsel clients, in collaboration with the healthcare team, to engage in moderate intensity dynamic exercise to be carried out for 30-60 minutes, 4 to 7 times a week.

Level of Evidence = Ia

Moderate intensity dynamic exercise includes walking, jogging, cycling or swimming (CHEP, 2004) and elicits 60% to 70% of maximum heart rate (CMA, 1999).

Formula for Maximum Heart Rate:

220 - client's age = maximum HR

220 - age X 0.6 = 60% maximum HR

220 - age X 0.7 = 70% maximum HR

⇒ **Practice Point:** It is important that the client check with their healthcare provider prior to beginning an exercise program.

Discussion of Evidence

Nurses are engaged in a professional therapeutic relationship related to their role in the healthcare system (College of Nurses of Ontario, 2004c), their education, and their contact with clients, to effectively assess and promote physical activity in individuals with hypertension. Assessment of physical activity level by the multidisciplinary team requires that the nurse consider how the following client specific variables affect current and future physical activity levels (Canadian Nurses Association, 2004):

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- Demographics (e.g., gender, age, ethnicity, income, education, etc.)
- Geography (where they live)
- Physical characteristics (e.g., physical condition, current health status, risk factors for disease, physical challenges, current activity level)
- Behavioural characteristics (e.g., what they enjoy doing, places they frequent)
- Psychographic characteristics (e.g., beliefs, opinions, preferences, feelings of self efficacy, readiness to change, perceived barriers)

When asking clients about their current physical activity level, nurses can use some key questions to establish frequency, intensity and perceived fitness. Some suggested questions include:

During a typical week, how many times do you engage in physical activity that is long enough and intense enough to cause sweating and a rapid heart rate?

- ☐ At least 4 times
- ☐ Normally once or twice
- ☐ Rarely or never

When you engage in physical activity, do you feel that you:

- ☐ Make an intense effort?
- ☐ Make a moderate effort?
- ☐ Make a light effort?

Generally, do you think your current fitness level is:

- ☐ Very Good
- ☐ Good
- ☐ Average
- ☐ Poor
- ☐ Very Poor

Tremblay, Shephard, McKenzie & Gledhill, 2001

Individuals at different stages of change respond most effectively to different types of strategies. If a nurse is able to determine which stage an individual client is in at a given point, he/she can work to promote physical activity in a way that is most appropriate for that individual at that point in time.

Many meta-analyses and reviews of intervention studies describing the effects of exercise on blood pressure have consistently shown that aerobic exercise training reduces resting systolic and diastolic blood pressure in both normotensive and hypertensive clients (Cooper, Moore, McKenna & Riddoch, 2000). Consistent evidence indicates that regular rhythmic (repeated low resistance movement) physical exercise of the lower extremities decreases both systolic and diastolic blood pressure by 5-7 mmHg, independent of weight loss, alcohol intake or salt intake (CMA, 1999). Higher intensity exercise is not more effective in reducing blood pressure (CHEP, 2005). Encouraging weight management along with exercise can help reduce blood pressure by 7 mmHg for systolic blood pressure and 5 mmHg for diastolic blood pressure (Blumenthal et al, 2000). A Food and Fitness Calculator is a useful tool that can indicate the relationship between the length of specific activities and the number of calories consumed from popular foods and burned during exercise (Refer to *Appendix Q*).

Two studies found significant reductions in blood pressure after only 4-5 weeks of training (CMA, 1999). The antihypertensive effect of training persisted as long as the training program. In contrast, the antihypertensive effect was no longer seen after detraining periods of 10 weeks. The antihypertensive effect of training is therefore reversible (CMA, 1999). Protection is lost when exercise is discontinued (Williams et al., 2004).

It is important that clients check with their healthcare provider before beginning an exercise program. In clients with severe hypertension or in those whose blood pressure is poorly controlled, heavy physical activity should be discouraged or postponed until appropriate drug therapy has been instituted and found to be effective (Williams et al., 2004).

In a report entitled *Nursing and the Promotion of Physical Activity* (CNA, 2004) an intervention is described that has been demonstrated to be effective in promoting physical activity in primary care. Written exercise advice was shown to be more effective than verbal advice alone in encouraging clients to adopt and sustain increased levels of physical activity over a six week period. Several organizations recommend that practitioners write individualized prescriptions for exercise as a method of promoting physical activity with clients (CHEP, 2004; HSFO, 2004).

The two most common reasons for being inactive are not enough time and not enough energy. It has been suggested that any activity appears to be helpful, but those who are more active appear to gain more benefit. A client can benefit just as much from three ten minute spurts of moderate activity as from a solid half-hour. Physical activity can also be banked during the day (HSFO, 2004).

Suggested activities for older adults:

- Walking
- Mall walking
- Gardening
- Golfing
- Water aerobics
- Bowling
- Tai Chi
- Light weight training
- Light house work

Suggested low cost action choices:

- Get off the bus or subway a stop earlier and walk
- Bicycle or walk to work
- Walk to the corner store, bank or post office
- Walk the kids to school
- Park further away and walk
- Wash the car by hand
- Take the stairs instead of the elevator
- Instead of sitting for a meeting with someone-take a walk while you talk

(HSFO, 2004)

Alcohol

Recommendation 2.9

Nurses will assess the client's use of alcohol, including quantity and frequency, using a validated tool.

Level of Evidence = Ib

Recommendation 2.10

Nurses will routinely discuss alcohol consumption with the client and recommend limiting alcohol use, as appropriate, to a maximum of:

- **Two standard drinks per day or 14 drinks per week for men;**
- **One standard drink per day or 9 drinks per week for women and lighter weight men.**

Level of Evidence = III

One standard drink is equivalent to:

- 5oz./142 ml. of wine (12% alcohol)
- 1.5oz./43 ml. of spirits (40% alcohol)
- 12oz./341 ml. regular strength beer (5% alcohol)

Centre for Addiction and Mental Health, 2004.

Discussion of Evidence

According to the Canadian Medical Association Hypertension Guidelines (1999) 75% of Canadians over the age of 15 consume alcohol, and 6.1% of adult Canadians consume 15 or more drinks per week. Epidemiological studies suggest that alcohol consumption is a strong predictor of hypertension in men (up to 33%) and in women (up to 8%) (CMA, 1999). The evidence shows that excessive alcohol consumption raises blood pressure independent of other risk factors including smoking, age, sex, race, coffee use, level of education, prior heavy drinking history and the type of alcohol consumed (Boggan, 2003; Oparil & Weber, 2000).

Attempting to define an absolute cause and effect relationship between alcohol and hypertension is complicated, as other factors come into play. Some of these factors include amount of alcohol ingested, chronic or binge drinking, underlying state of health and effects of alcohol on the myocardium.

A study done by De la Sierra (1996, as cited in Estruch, 2003) indicates some people are sensitive to the pressor effects of alcohol. One group of individuals had a mean rise in blood pressure of at least 3 mmHg compared to another group of "resistant" individuals who had no rise in their blood pressure when ingesting alcohol in the same controlled circumstances.

Although there is conflicting results in the research there are common theories explaining the effect of alcohol on blood pressure. Some of these theories are listed below:

- increased intracellular calcium or other electrolytes in vascular smooth muscle (Boggan 2003; Estruch, 2003; Lip & Beevers, 1995; Oparil & Weber, 2000)
- inhibition of vascular relaxing substances e.g., Nitric oxide (Boggan, 2003; Cushman, 2001; Estruch, 2003; Lip & Beevers, 1995)
- stimulation of the sympathetic nervous system, renin-angiotensin-aldosterone system, insulin resistance, or cortisol (Boggan, 2003; Cushman, 2001; Estruch, 2003; Lip & Beevers, 1995; Oparil & Weber, 2000)
- increased acetaldehyde (Cushman, 2001; Lip & Beevers, 1995)
- calcium or magnesium depletion (Boggan, 2003; Cushman, 2001; Estruch, 2003; Lip & Beevers, 1995; Oparil & Weber, 2000)
- chronic state of withdrawal in heavy users (Boggan, 2003; Cushman, 2001; Estruch, 2003; Lip & Beevers, 1995; Oparil & Weber, 2000)

Assessment of alcohol use can be done with a standardized tool. The CAGE questions are one example of a commonly used tool. This tool is a series of four questions meant to assess for alcohol dependence in a non-threatening manner. The questions should be part of an overall health assessment and asked at every visit regarding recent alcohol consumption. A positive response to any one of the four questions would indicate to the healthcare professional that there is a suspicion of over consumption. The CAGE tool has sensitivity ranging from 75-89% and specificity of 68-96% in detecting alcoholics when at least two positive answers were given in a general medicine clinic setting (Haggerty, 1994).

Another tool, the Alcohol Use Disorders Identification Test (AUDIT), was designed specifically to detect problem drinkers rather than alcoholics. The AUDIT tool takes slightly longer to administer and consists of 10 questions. Responses are scored from 0-4 with a total possible score of 40 points. A score of 10 or more points indicates problem drinking. This tool places the emphasis on heavy drinking and frequency of intoxication rather than signs of dependency. The tool was developed by the World Health Organization (WHO). In its initial pilot in six different countries, the sensitivity averaged 80% and specificity averaged 98% for detecting excessive alcohol consumption (Haggerty, 1994).

If alcohol overuse is suspected or identified, the client should be counseled on the negative health effects and referral to an alcohol treatment specialist or program may be appropriate (Cushman, 2001).

Examples of the CAGE questions and AUDIT tools are listed in *Appendix L*, along with a list of other assessment tools. This list of tools is not all-inclusive, and some of the tools are designed for use with specialized populations or as part of a broader substance use evaluation.

Research has shown that approximately half of clients with excessive alcohol use have blood pressure readings >160/90, and these values were found to normalize during abstinence. Similar trends were found within a broader population base leading researchers to believe the blood pressure effects of alcohol are due to alcohol consumed in the days immediately prior to measurement and the effect is rapidly reversible (Seppa & Sillanaukee, 1999).

Binge drinking raised systolic and diastolic pressure during the drinking episode, and there was a drop in both pressures to below baseline levels in the immediate post-drinking period, usually in the early morning hours. Furthermore, binge drinking was found to be a risk factor for stroke in young persons who consumed alcohol on weekends and holidays, prime drinking times. As well, moderate to heavy alcohol use was related to intracerebral hemorrhage. Although there is no direct evidence, this study would suggest a link between alcohol, hypertension and stroke (Seppa & Sillanaukee, 1999).

Multiple population cohort and cross-sectional trials have shown little difference in blood pressure in clients with low alcohol consumption and abstainers. There is also evidence to support the limited consumption of alcohol for its cardio protective effects. Nurses need to be aware of this evidence and should not discourage consumption within the recommended guidelines nor should they encourage the initiation of drinking as a method of risk factor reduction related to the associated potential health risks of overuse (Williams et al., 2004).

Adoption of healthy lifestyle behaviours is an important factor in prevention of high blood pressure and lowering blood pressure in those known to be hypertensive. By limiting the use of alcohol individuals may delay/prevent the incidence of hypertension and decrease systolic blood pressure by 2-4 mmHg (Institute of Clinical Systems Improvement, 2004; NIH, 2003). Adherence to low alcohol consumption guidelines will enhance drug efficacy. It has been recognized that excessive use can increase resistance to the effects of antihypertensive medications (NIH, 2003). This resistance may be a result of poor adherence to the medication regime and/or a change in pharmacokinetics of the antihypertensive agent metabolized by the liver that is under the influence of acute or chronic alcohol ingestion (Lip & Beevers, 1995). Alcohol has a high caloric count with no noted nutritional value. Limiting its use will aid in weight reduction, another strongly recommended strategy to decrease blood pressure, and may lower triglyceride levels (ICSI, 2004). In conclusion, limiting the consumption of alcohol, to within recommended guidelines, has shown a modest reduction in hypertension. Combining this strategy with other lifestyle modification strategies results in further reduction of blood pressure (NIH, 2003; Williams et al., 2004; SIGN, 2001).

Smoking

Recommendation 2.11

Nurses will be knowledgeable about the relationship between smoking and the risk of cardiovascular disease.

Level of Evidence = IV

Discussion of Evidence

The up-to-date evidence of the relationship between smoking and hypertension is conflicting and mainly suggests that there is no direct link between these two risk factors. Smoking and hypertension are both independent risk factors which accelerate atherosclerosis and blood vessel injury, increasing the risk of vascular disease and subsequent end organ damage (heart, brain, kidney, eye or limbs). Atherosclerosis is a complex, diffuse and progressive process with a variable distribution and clinical presentation. Risk factors play an important role in initiating and accelerating the process (Faxon et al., 2004).

There is overwhelming evidence of the relationship between smoking and cardiovascular and pulmonary diseases (NICE, 2004), which supports the need for smoking cessation. Extensive observational data has shown that smoking has a graded adverse effect on cardiovascular health and increases cardiovascular

disease risk more than mild hypertension (Williams et al., 2004). Smoking exacerbates uncontrolled hypertension, atherosclerosis, and blood vessel injury (Lamb & Bradford, 2002). Tobacco use – cigarette smoking in particular – increases blood pressure and damages the blood vessels, increasing stroke risk (Barker, 2001). A quarter of all strokes can be attributed to smoking (Lamb & Bradford, 2002).

According to the British Hypertension Society Guidelines (Williams et al., 2004), cigarette smoking does not appear to be associated with hypertension, except for chronic and heavy smoking. Blood pressure rises acutely during smoking. Since blood pressure readings are usually taken when the client is not smoking, blood pressure is systematically underestimated among those who smoke regularly.

Evidence suggests that smoking may interfere with the full degree of antihypertensive therapy protection against cardiovascular disease (NIH, 1997). Data suggests that smoking may interfere with the beneficial effects of some antihypertensive agents, such as β -blockers or may prevent the benefits of more intensive blood pressure lowering (European Society of Hypertension, 2003).

Recommendation 2.12

Nurses will establish clients' tobacco use status and implement Brief Tobacco Interventions at each appropriate visit, in order to facilitate smoking cessation.

Level of Evidence = Ia

Discussion of Evidence

There is strong evidence that smoking cessation is the single most powerful lifestyle measure that can reduce the risk of vascular diseases, and target organ damage on the heart, brain, kidneys and limbs (ESH, 2003). There is a rapid decline in cardiovascular risk, by as much as 50% after 1 year, for those who stop smoking. Up to 10 years may be needed to reach the risk level of those who never smoked (Williams et al., 2004). Individuals need to recognize their increased risk due to smoking and the benefits of cessation. Despite significant declines in smoking in the past three decades, trends to stop smoking have slowed, and recently, smoking has increased among young minorities. This emphasizes that tobacco use should be assessed at every visit (Keevil, Stein & McBride, 2002).

A Cochrane systematic review has confirmed the effectiveness of physicians' advice to stop smoking (Rice & Stead, 2005). Physician advice and encouragement given repeatedly over time has shown to reduce smoking by 21% (Williams et al., 2004). Although there is less support for advice given by non-physician clinicians, the overall recommendation suggests that all clinicians provide interventions (Rice & Stead, 2005). Nurses are in an ideal position to counsel clients on smoking cessation. This review notes the potential benefits of smoking cessation advice and/or counseling given by nurses to clients, with reasonable evidence that intervention can be effective. "Most smokers want to quit, and may be helped by advice and support from healthcare professionals. Nurses are the largest healthcare workforce, and are involved in virtually all levels of healthcare. The review of trials found that advice and support from nursing staff could increase people's success in quitting smoking, especially in a hospital setting. Similar advice and encouragement given by nurses at health checks or prevention activities may be less effective, but may still have some impact." (Rice & Stead, 2005. pg. 2).

Many national and international nursing associations support nurse's roles in smoking cessation. RNAO recognizes that "nurses are ideally positioned to provide a leadership role related to smoking cessation at the individual program and/or policy level" (RNAO, 2002b). The Canadian Nurses Association's (2001) position statement on reducing the use of tobacco products emphasizes that as the largest group of health professionals in Canada and as a Canadian presence abroad, nurses are in a powerful position to help reduce tobacco product use in Canada and globally. It recognizes that nurses have advocacy opportunities both in their individual practices and as a strong united voice. Nurses are encouraged to integrate tobacco use assessment, counseling and interventions into their practices and to lead in conducting research. According to the American Nurses Association, client education and preventative healthcare interventions to stop tobacco use should be part of nursing practice (ANA, 1995).

The U.S. Public Health Service-sponsored Clinical Practice Guideline: *Treating Tobacco Use and Dependence* (Fiore, 2000) recommends that medical offices include tobacco use as a vital sign. This ensures proper documentation of tobacco use and smoking cessation counseling in the client's medical chart (Arizona Department of Health Services, 2005). Highest screening and counseling rates are found when tobacco use is included with the vital signs for each client (Keevil et al., 2002).

Individuals who smoke must be told repeatedly and unambiguously to stop smoking (NIH, 1997). According to the U.S. Public Health Service Report (cited by Keevil et al. 2002) on average, three to five attempts are made before successful cessation is achieved. The probability of successful smoking cessation increases with each attempt and there is a 10-fold increase in success rates among those counseled during a clinical visit. Follow up and the number of contacts between the client and provider are also significant predictors of clinical success (Keevil et al, 2002). Systematic reviews indicate that 79% to 90% of those who smoke want to quit smoking (Coultais, 1991; Emmons, 1992 as cited in Rice and Stead, 2005) and 70% of those who smoke visit a healthcare professional each year (Cherry 2003 as cited in Rice & Stead, 2005) – factors that may assist in the smoking cessation efforts. Nurses are involved in the majority of these visits and could therefore have a profound effect on the reduction of tobacco use (Whyte, 2003 as cited in Rice & Stead, 2005).

Individuals who use tobacco can benefit from several types of interventions (Fiore et al, 2000). These can range from very simple encounters to multi-session treatment programs. These interventions are known as minimal, brief and intensive interventions. The Medical and Allied Healthcare Professionals: Basic Tobacco Intervention Skills Guidebook (Arizona Department of Health Services, 2005) states that "Brief tobacco interventions delivered by multiple persons (including both medical and non-medical persons) are more effective in helping people quit using tobacco than minimal interventions (such as free literature) alone, 25.5% versus 8.1%, respectively (Fiore et al., 1996). By delivering a stage-appropriate Five A Model brief intervention (see Figure 5 and *Appendix M*) one has the potential of increasing a client's likelihood of smoking cessation by at least 60%." (Fiore et al., 2000). This model, recommended by the U.S. Public Health Service, is an integrated stage-based brief smoking cessation intervention. It outlines a sequence of support activities (Ask, Advise, Assess, Assist, and Arrange – see Figure 5) that are effective for helping clients to change health risk behaviors (Arizona Department of Health Services, 2005). Refer to *Appendix D* to assist with counseling techniques.

- A **minimal intervention** is one in which the healthcare professional and the person who smokes have no significant personal interaction.
- A **brief intervention** is a structured conversation in which the healthcare professional uses the **Five A Model: Ask, Advise, Assess, Assist and Arrange**.
- An **intensive intervention** is one in which there are at least four sessions lasting 10 minutes or more.

(Arizona Department of Health Services, 2005)

Training on smoking cessation and Brief Intervention is available in many communities. The RNAO Nursing Best Practice Guideline: *Integrating Smoking Cessation into Daily Nursing Practice (2003)* recommends that nursing programs should include content about tobacco use, associated health risks and smoking cessation interventions as core concepts in nursing curricula. Practicing nurses should be encouraged to inquire about the availability of additional training on smoking cessation in their community.

Nurses need to be aware that the use of nicotine replacement therapies (NRT) is safe in hypertensive clients and approximately doubles smoking-cessation rates (Williams et al., 2004). The lower amounts of nicotine contained in smoking cessation aids does not usually raise blood pressure, therefore, these aids may be used with appropriate counseling and behaviour interventions (Khoury et al. as cited in NIH, 1997). All forms of NRT are effective, particularly in those who seek help in stopping smoking (Law & Tang, 1995; Silagy, Mant, Fowler & Lodge, 1994). Nicotine replacement therapy is not an independent risk factor for acute myocardial events. However, NRT should be used with caution with clients in the immediate (within 2 weeks) post-myocardial infarction period, those with serious arrhythmias, and those with serious or worsening angina (Fiore et al., 2000). The Ontario Medical Association (1999) position paper, *Rethinking Stop-smoking Medications: Myths and Facts*, is a comprehensive document and addresses the use of stop-smoking medications and clarifies many myths pertaining to NRT.

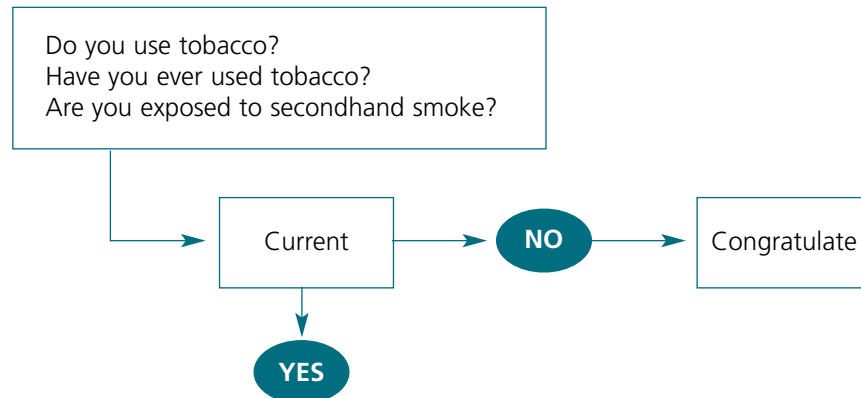
Many municipalities have adopted smoke-free bylaws. The evidence on the impact of a smoke-free policy on smoking cessation rates is not yet available. This is an area for future research. However, some insight can be gleaned from the review of the literature on the effects of smoke-free workplaces, which reveals that these policies not only protect non-smokers from the dangers of passive smoking, but also encourage those who smoke to quit or to smoke 3.1 fewer cigarettes per day (Fichtenberg & Glantz, 2002).

Figure 5: Algorithm for Brief Tobacco Intervention

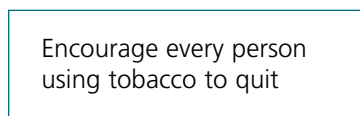
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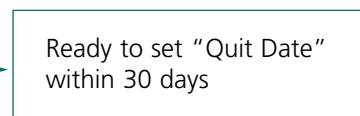
1. Ask



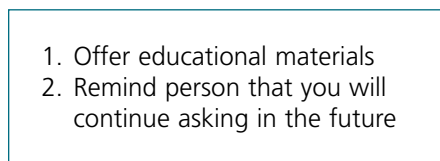
2. Advise



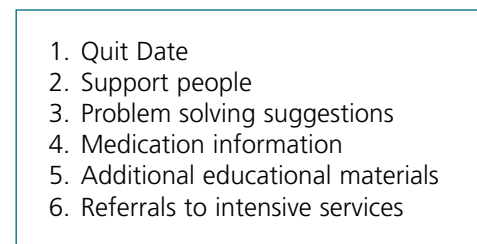
3. Assess



4. Assist



4. Assist



5. Arrange



Stress

Recommendation 2.13

Nurses will assist clients diagnosed with hypertension to understand how they react to stressful events and to learn how to cope with and manage stress effectively. *Level of Evidence = IV*

Discussion of Evidence

Stress is an unavoidable fact of life. Outside pressures or demands, especially those in which we perceive a loss of control, can make us feel tense. Although stress that drives or motivates a person to complete a task may be helpful, stress derived from psychological factors (depression), behavioural dispositions (hostility), and psychosocial stress can directly influence both physiological function and health outcomes (CHEP, 2004). Stress related to depression, social isolation, and lack of quality support increases the risk of coronary artery disease similar to conventional risk factors such as smoking, dyslipidemia and hypertension, but it remains unclear what the role of effective stress management is when optimizing blood pressure control (Bunker et al., 2003; Matitila, Malmivaara, Kastarinen, Kievla & Nissinen, 2003).

Stressful situations range from major life altering events to multiple small situations that build up over time. Awareness of what causes stress, acceptance that life is not perfect and coping by learning strategies to effectively handle stress can reduce the risk of stress related conditions and enhance overall general health. Ultimately, it is the client's choice whether to adopt healthy lifestyle behaviours to manage stress or not. It will take patience to understand, acknowledge and accept those problems that have been a part of their lives for a long time. In the end, for overall good health, stress should be managed effectively.

Refer to *Appendix N* for a questionnaire to assess an individual's vulnerability to stress.

Helpful Hints:

1. Assist clients to identify three situations that cause stress in their lives.
2. What are the triggers?
3. Have the client write down how they respond/react when their "buttons are pushed".
4. Help the client set realistic expectations/goals – deal with one stressor at a time.
5. Facilitate client to think critically and adopt strategies to accept the situation.
Remember that we are all different, and that coping strategies should be individualized.
6. Have the client explore ways to slow down, relax and avoid creating more stress.

Summary of Coping Strategies

Positive coping strategies include:

- Daily physical exercise
- Talking problems over with someone trustful
- Getting enough rest
- Eating a healthy diet
- Decreasing amount of caffeine and alcohol
- Laughing
- Saying “no” without feeling guilty
- Learning to relax – especially by doing something that is enjoyable
- Accept that one cannot do it alone and that this acceptance is a sign of strength and a step forward
- Seeking assistance through referral to members of the multidisciplinary team (social work, psychology, psychiatry)

Negative coping strategies include:

- Denial
- Abuse of alcohol
- Abuse of drugs
- Abuse of food
- Abuse of tobacco products

Summary of Lifestyle Interventions in Hypertensive Adults (CHEP, 2005)

⇒ *Practice Point:*

- Sodium Intake – Target 65-100 mmol/day
- Weight – Target BMI <25 kg/m²
- Waist Circumference – Target <102 cm for men; <88 cm for women
- Alcohol Consumption – Target less or equal to 2 drinks/day
- Dietary Patterns – Follow the DASH diet
- Smoking – Target smoking cessation and a smoke-free environment

Medications

Recommendation 3.1

Nurses will obtain clients' medication history, which will include prescribed, over-the-counter, herbal and illicit drug use.

Level of Evidence = IV

Recommendation 3.2

Nurses will be knowledgeable about the classes of medications that may be prescribed for clients diagnosed with hypertension.

Level of Evidence = IV

Recommendation 3.3

Nurses will provide education to clients regarding the pharmacological management of hypertension, in collaboration with physicians and pharmacists.

Level of Evidence = IV

Discussion of Evidence

Prescribing antihypertensive medications is typically not within the scope of nursing practice, except for nurses in advanced practice roles, such as RNs in the Extended Class, or nurse practitioners working under medical directives in hospital settings. However, nurses are in the best position to provide education about antihypertensive medications and monitor their therapeutic effectiveness (Bengtson & Drevenhorn, 2003). Nurses have an important role in advising clients on pharmacological measures and possible drug side effects (SIGN, 2001). Studies have found that nursing interventions, including blood pressure checks, lifestyle and medication advice and monitoring, either on home visits or at the community clinics, were effective in reducing blood pressure in hypertensive clients (Garcia-Pena et al., 2001; New et al., 2003). Hence, nurses must be knowledgeable about the classes of medications that may be prescribed for clients diagnosed with hypertension.

A combination of therapies – both pharmacological and lifestyle – are generally necessary to achieve target blood pressures (CHEP, 2005). Nurses should educate clients that combination therapy may be necessary to manage their hypertension. RCTs have shown that antihypertensive therapy in clients with uncomplicated hypertension can reduce the incidence of cardiovascular disease by 25-30% (CHEP, 2004). In a single large RCT – the Hypertension Detection and Follow-Up study – vigorous antihypertensive drug therapy was shown to reduce blood pressure (weighted mean difference -8.2/-4.2 mmHg, -11.7/-6.5 mmHg, -10.6/-7.6 mmHg for 3 strata of entry blood pressure) and all-cause mortality at five years follow-up (6.38% versus 7.78%, difference 1.4%) (Fahey, Schroeder & Ebrahim, 2003).

Most clients require a systematic stepped care approach with more than one antihypertensive drug to achieve recommended blood pressure targets (CHEP, 2005; NIH, 2003). Antihypertensive medications are divided into five drug classes, including: diuretics, beta-adrenergic antagonists, ACE inhibitors, calcium channel blockers and angiotensin II receptor blockers (ARBs) (CHEP, 2005; NIH, 2003; SIGN, 2001; Williams et al., 2004). Refer to *Appendix O* for a summary of medications commonly prescribed for hypertension. Although some specific outcomes may differ between the classes, broadly similar cardiovascular protection from all these agents has been found in a number of clinical trials (NIH, 2003). The most recent CHEP (2005) recommendations indicate that any of the five drug classes shown to reduce cardiovascular outcomes in hypertensive clients is an appropriate choice for first line monotherapy in hypertensive individuals.

Nursing Management of Hypertension

Evidence suggests that reducing hypertension-related complications is more dependent on the extent of blood pressure lowering achieved than on the choice of any specific first-line drug (CHEP, 2005; Williams et al., 2004). A client's global cardiovascular risk, including the presence of certain high risk health conditions, has implications in terms of choice of specific drug therapies (CHEP, 2005). Refer to *Appendix O* for suggested resources regarding global vascular protection risk and treatment recommendations for clients with high risk health conditions. Considerations related to individual client preferences and economic factors (e.g., medication cost) must also be taken into account.

Some clients who take over-the-counter medications, vitamin/nutritional supplements or elect to augment their pharmacological treatment of blood pressure with herbal remedies (Miller & Kazal, 1998) may be unaware that any of these preparations may have potential interactions with the antihypertensive medications or may cause elevated blood pressure (e.g., NSAIDs). All clients should be asked whether they use any natural/over-the-counter/supplements products and should be advised that "natural" does not necessarily equal "safe" (UpToDate, 2005). To date, the effectiveness and safety of herbal preparations has not been studied in the same rigorous manner as conventional treatment, hence, evidence-based guidelines for the use of alternative treatments are not currently available. Some herbal remedies have been known to potentiate the antihypertensive effects of the drugs (e.g., garlic), whereas others may counteract the effect of the drugs, either due to their own hypertensive properties (e.g., ephedra, yohimbe, ginseng, ma huang), or by interfering with the levels of antihypertensive drugs (e.g., St. John's Wort, licorice, yarrow, red pepper, mistletoe, don quai, coltsfoot) (Canadian Pharmacists Association, 2005; Lexi-Comp, 2004-2005; Micromedex, 2005; Miller & Murray, 1998; UpToDate, 2005). It is important that nurses, in collaboration with pharmacists and physicians, educate clients about antihypertensive medications, including potential interactions with herbals/supplements/over-the-counter preparations and to either avoid these remedies or take them with caution.

Illicit drugs including cocaine, marijuana, amphetamines, and methylenedioxymethamphetamine (Ecstasy) are potential causes of hypertension, and their use may be an underlying factor in resistant hypertension (NIH, 2003). Substance abuse and hypertension are an important health concern, especially in adolescent and young adults presenting with elevated blood pressure and associated cardiovascular conditions (Ferdinand, 2000). Nurses, in collaboration with pharmacists and physicians, should question clients about drug use and educate them about the risks and the potential interactions with antihypertensive medications.

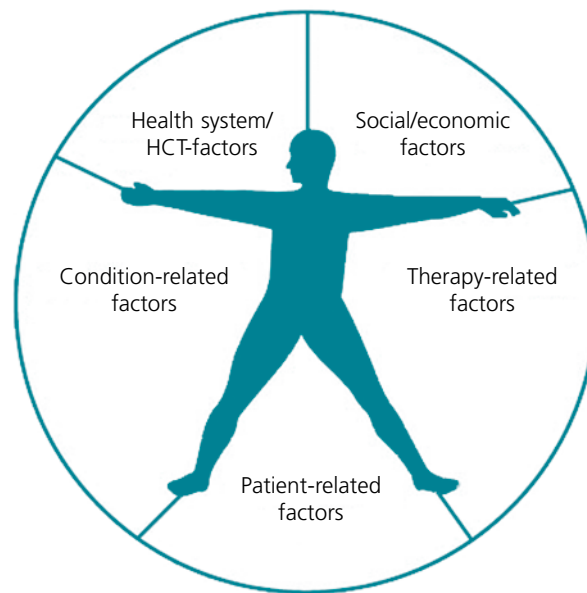
Adherence

World Health Organization, 2003

Adherence, the extent to which a client's behaviour (taking medication, following a diet, modifying habits or attending clinics) coincides with healthcare giver advice, is the single most important modifiable factor that compromises treatment outcome (Haynes, McDonald & Garg, 2002; WHO, 2003). The term adherence is intended to be non judgemental, a statement of fact rather than of blame of the prescriber, client or treatment.

Adherence is a phenomenon determined by the interplay of five dimensions or factors (Figure 6) – social and economic, health and health system-related, condition-related, therapy-related and client-related (WHO, 2003). There has been a tendency in the past to base education and adherence strategies on the belief that clients are solely responsible for their treatment – this approach reflects a misunderstanding of how these complex dimensions affect behaviour and the capacity to adhere to treatment (WHO, 2003). All five dimensions should be considered in a systematic exploration of adherence and the interventions aimed at improving it.

Figure 6: The five dimensions of adherence



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A. Social and economic factors

The main economic and social concerns that should be addressed in relation to adherence are poverty, access to healthcare and medicines, literacy, provision of effective social support networks and mechanisms for the delivery of health services that are sensitive to cultural beliefs about illness and treatment. Universal and sustainable financing, affordable prices and reliable supply systems are required if good rates of adherence to therapies are to be achieved.

Community-based organizations, education of illiterate clients, assessment of social needs and family preparedness have been reported to be effective social interventions for improving adherence. Social support has been consistently reported as an important factor affecting health outcomes and behaviours. There is

substantial evidence that peer support among clients can improve adherence to therapy while reducing the amount of time devoted by health professionals to the care of clients with chronic conditions. Community interventions have also been shown to result in economic and health benefits by improving clients' self-management capacities by promoting the maintenance and motivation required for self-management, as well as keeping the client active in the knowledge of his or her disease and in the acquisition of new habits.

B. Healthcare team and system-related factors

Healthcare system variables include the availability and accessibility of services, support for education of clients, data collection and information management, provision of feedback to client and healthcare providers, community supports available to clients, and the training provided to health service providers. The healthcare system influences clients' behaviour as it directs provider's schedules, dictates appointment lengths, allocates resources, sets fee structures and establishes organizational priorities.

Relatively little research has been conducted on the effects of the healthcare team and other system related factors on clients' adherence. A WHO review (WHO 2003) found five major barriers to adherence that were linked to the health system and team:

1. Lack of awareness and knowledge about adherence;
2. Lack of clinical tools to assist health professionals in evaluating and intervening in adherence problems;
3. Lack of behavioural tools to help clients develop or change health behaviours;
4. Gaps in the provision of care for chronic conditions; and
5. Suboptimal communication between clients and health professionals.

An interesting study by Albaz in Saudi Arabia concluded that system-related variables (time spent with the doctor, continuity of care by the doctor, communication style of the doctor and interpersonal style of the doctor) are far more important than sociodemographic variables (gender, marital status, age, educational level and health status) in affecting clients' adherence (WHO, 2003).

C. Condition-related factors

Condition-related factors represent particular illness-related demands faced by the client. Some strong determinants of adherence are those related to the severity of symptoms, level of disability (physical, psychological, social and vocational), rate of progression and severity of the disease, and the availability of effective treatments. Their impact depends on how they influence clients' risk perception, the importance of following treatment, and the priority placed on adherence. Co-morbidities, such as depression and substance abuse are important modifiers of adherence behaviour. Screening for these conditions could be included in adherence counseling.

Hypertension is referred to as the "silent killer" because there are limited associated symptoms. Due to hypertension's asymptomatic nature, it poses some unique adherence challenges.

D. Therapy-related factors

There are many therapy-related factors that affect adherence. Most notable are those related to the complexity of the medical regimen, duration of treatment, previous treatment failures, frequent changes in treatment, the immediacy of beneficial effects, side effects, and the availability of medical support to deal with them. Therapy-related factors influencing adherence rates to antihypertensive therapy include dosing frequency, adverse effects, therapy duration, pill burden, and the asymptomatic nature of hypertension (Takiya, Peterson & Finley, 2004).

Poor adherence has been identified as the main cause of failure to control hypertension. The best available estimate is that poor adherence to therapy contributes to lack of good blood pressure control in more than two-thirds of people living with hypertension. Because there is no immediate, recognizable benefit from taking antihypertensives, client may be less likely to adhere to their medications than would clients with conditions that have clear symptoms (Takiya et al., 2004).

E. Client-related factors

Client characteristics have been the focus of numerous investigations of adherence. Factors such as age, sex, education, occupation, income, marital status, race, religion, ethnic background, and urban versus rural living have not been definitely associated with adherence (Haynes et al., 2002; WHO, 2003).

While age has not been definitively associated with adherence, the prevalence of cognitive and functional impairments in elderly clients is known to increase their risk of poor adherence. Multiple co-morbidities and complex medical regimens further compromise adherence. In the elderly, failure to adhere to medical recommendations and treatment has been found to increase the likelihood of therapeutic failure, and to be responsible for unnecessary complications, leading to increased spending on healthcare, as well as to disability and early death. This is a significant health issue in Canada and other developed countries as people over 60 consume approximately 50% of all prescription medicines.

Some of the client-related factors reported to affect adherence are: forgetfulness; psychosocial stress; anxieties about possible adverse effects; low motivation; inadequate knowledge and skill in managing the disease symptoms and treatment; lack of self-perceived need for treatment; lack of perceived effect of treatment; negative beliefs regarding the efficacy of the treatment; misunderstanding and non-acceptance of the disease; disbelief in the diagnosis; lack of perception of the health risk related to the disease; misunderstanding of treatment instructions; lack of acceptance of monitoring; low treatment expectations; low attendance at follow-up, or at counseling, motivational, behavioural, or psychotherapy classes; hopelessness and negative feelings; frustration with healthcare providers; fear of dependence; anxiety over the complexity of the drug regimen; and feeling stigmatized by the disease. Perceptions of personal need for medication are influenced by symptoms, expectations and experiences and by illness cognitions.

The major client-related barriers to adherence described in the literature were lack of information and skills as they pertain to self-management, difficulty with motivation and self-efficacy, and lack of support for behavioural changes. Increasing the impact of interventions aimed at client-related factors is essential. Clients need to be informed, motivated and skilled in the use of cognitive and behavioural strategies if they are to cope with the treatment demands of their illness.

ASSESSMENT OF ADHERENCE

Recommendation 4.1

Nurses will endeavour to establish therapeutic relationships with clients.

Level of Evidence = IV

Discussion of Evidence

The responsibility for adherence must be shared between the healthcare provider, the client and the healthcare system. The manner in which healthcare providers interact and communicate with their clients is a key determinant of adherence and client health outcomes. Empathetic and non-judgmental attitude and assistance, ready availability, good quality of communication and interaction are some of the important attributes shown to be determinants of the adherence of clients (WHO, 2003). Clients of providers who share information, build partnerships and provide emotional support have better outcomes than the clients of providers who do not interact in this manner (WHO, 2003).

A therapeutic nurse-client relationship is established and maintained by the nurse and the client, through the use of professional nursing knowledge, and skill and caring attitudes and behaviours to provide nursing services that contribute to the client's health and well-being. The relationship is based on trust, respect and intimacy, and requires the appropriate use of the power inherent in the care provider's role (College of Nurses of Ontario, 2004b). Client centred care is a cornerstone of the therapeutic nurse-client relationship. It involves advocacy, empowerment, and respecting the client's autonomy, voice, self-determination and participation in decision making (RNAO, 2002a).

Recommendation 4.2

Nurses will explore clients' expectations and beliefs regarding their hypertension management.

Level of Evidence = III

Discussion of Evidence

Clients' knowledge and beliefs about their illness, motivation to manage it, confidence (self-efficacy) in their ability to engage in illness-management behaviours, expectations regarding the outcome of treatment and the consequences of poor adherence, all interact in ways not yet fully understood to influence adherence behaviour (WHO, 2003).

Expectations are defined as verbal or explicit communication of clients' wishes and desires to their health provider. Clients whose expectations are unmet are less likely to be satisfied with their care, and are less likely to adhere to recommended treatment and healthcare advice. They report poorer health-related outcomes and increased healthcare utilization than those whose expectations are met (Ogedegbe, Mancuso & Alлегранте, 2004). Client's beliefs about treatment influence treatment preference, adherence, and outcomes (Horne & Weinman, 1999). Horne and Weinman's (1999) cross-sectional study examined clients' personal beliefs about the necessity of their prescribed medication and their concerns about taking it in order to assess relations between beliefs and adherence. His findings support the view that clients should be regarded as active decision-makers who will be more motivated to use their medication as instructed if their belief in its necessity outweighs their concerns about taking it (Horne, 1999).

Ogedegbe, Mancuso & Allegrante (2004) uncovered the following client misconceptions regarding hypertension and antihypertensive therapy in a study of an African American population:

- there is no need to take medications in the absence of symptoms or when the blood pressure is normal
- high blood pressure can self-regulate, so there is no need to take medications
- the medications are toxic and may cause damage to the kidneys, liver, eyes, or other parts of the body and even death
- taking high blood pressure medications daily is addictive or habit-forming
- medications do not work, so there is no reason to take them.

These misconceptions illustrate the importance of eliciting client expectations and beliefs regarding hypertension and its treatment. This exploration may enhance the interaction between clients and their healthcare providers with a resultant development of mutual treatment goals (WHO, 2003).

In practice, eliciting client's beliefs about their medication could provide the basis for a closer partnership in medication usage. Nurses may consider asking the following questions to help uncover client expectations and beliefs regarding the condition and treatment regimen:

- What medications are you taking?
- When do you take your medications?
- Do you know what your medications are for?
- How long do you anticipate that you be taking your medications?
- Do you expect to take your medications for life?
- Do you think there will be a cure for your high blood pressure?

Understanding clients' beliefs may facilitate the creation of a mutual hypertension treatment plan and promote improved adherence in the long term. Understanding and communicating beliefs and values helps nurses to prevent ethical conflicts and to work through them when they occur (CNO, 2004c).

Recommendation 4.3

Nurses will assess clients' adherence to the treatment plan at each appropriate visit.

Level of Evidence = III

Discussion of Evidence

An approach that combines feasible self-reporting and reasonable objective measures is the current state-of-the-art in measurement of adherence behaviour (WHO, 2003). Asking about adherence will detect more than 50% of those with low adherence, with a specificity of 87% (Haynes et al., 2002). Treatment response will give information about adherence, as will attendance at appointments. If applicable, drug levels and the frequency of refilling prescriptions at the pharmacy may be used to measure adherence (Haynes et al., 2002).

A number of studies (Haynes et al., 2002, Johnson et al., 1999, Ogedegbe, Harrison, Robbins, Mancuso & Allegrante, 2004) have explored clients' adherence to medication regimens and the factors that may influence adherence. The following table includes questions that have been used in these studies. Nurses and other health professionals may find them to be helpful when exploring adherence with their clients at initial and follow-up visits.

ADHERENCE ASSESSMENT QUESTION	RATIONALE
Have you missed any pills in the past week?	A self report that indicates missing any medications is consistent with a medication adherence rate of less than 60% (Haynes et al., 2002).
How is your blood pressure doing? Are you having any problems with your medications?	These questions assess perceptions of medication need, medication effectiveness and medication safety (Johnson, 2002). Ogedegbe et al., (2004a) explored medication specific barriers to adherence – these encompassed clients’ perceptions of the qualities of medications, the consequences of taking them and their experiences with the medication. Medications themselves were frequently described as barriers to adherence because of side effects, number of medications taken daily, frequency of dosing, taste, treatment duration and cost.
Are you having any trouble getting and taking your medications? Are you able to be regular in your medication taking? What is your routine in taking your medications?	These questions assess ability to access medications and medication patterns (Johnson, 2002) as well as logistical barriers such as access to medications (e.g., filling prescriptions, getting refills, booking clinic appointments, not having enough prescription refills, running out of medications) and the inconvenience of medications (e.g., carrying medications, frequent clinic visits and having to use bathrooms in public places) (Ogedegbe et al., 2004a).

PROMOTION OF ADHERENCE

Many interventions designed to improve adherence have been studied in hypertensive clients (Takiya et al., 2004). A 2004 meta-analysis revealed that the issue of adherence is multifaceted and that a client-specific approach to promote adherence may be optimal (Takiya et al., 2004). Haynes et al. (2002) suggest that improving adherence to long-term treatment regimens requires a combination of methods that include the following: providing information about the regimen; counseling about the importance of adherence and how to organize medication taking; reminders about appointments and adherence; rewards and recognition of clients; and enlisting social support from family and friends (Haynes et al., 2002). A systematic review revealed that almost all the interventions that were effective for improving adherence for chronic health problems are complex. The authors suggested that these complex strategies were not very effective despite the amount of effort and resources they consumed. They concluded that there is no evidence that low adherence can be “cured”, therefore efforts to improve adherence must be maintained for as long as the treatment is needed (Haynes et al., 2002).

While no compelling evidence exists to support one specific intervention or combination of interventions to improve adherence, Recommendations 4.4-4.7 provide nurses and clients with a range of evidence to support the achievement of long-term adherence.

Recommendation 4.4

Nurses will provide the information needed for clients with hypertension to make educated choices related to their treatment plan.

Level of Evidence = III

Discussion of Evidence

Educating clients about the nature and characteristics of hypertension, their medications, the probability of taking medications for life, and meaning of blood pressure readings allows clients to make informed choices about modifications to their medication regimens (CHEP, 2004; Johnson, 2002). Increased understanding will build self-efficacy (Bandura, 1986), and encourage clients to persevere with treatment. Education will also clarify misconceptions, a common barrier to adherence.

Although adherence interventions directed towards clients have typically focused on providing education to increase knowledge, the available evidence shows that knowledge alone is not enough. First-line interventions to optimize adherence must go beyond the provision of advice and prescriptions (WHO, 2003). The major barriers to adherence described in the literature were lack of information and skills as they pertain to self-management (WHO 2003). Roter et al. (1998) published a meta-analysis of adherence-enhancing interventions that concluded, “no single strategy or programmatic focus showed any clear advantage compared with another and that comprehensive interventions combining cognitive, behavioural, and affective [motivational] components were more effective than single-focus interventions” (pg. 1138). Clients need to be informed, motivated and skilled in the use of cognitive and behavioural self-regulation strategies if they are to cope effectively with the treatment-related demands imposed by their illness.

Recommendation 4.5

Nurses will work with prescribers to simplify clients’ dosing regimens.

Level of Evidence = Ia

Discussion of Evidence

A systematic review designed to determine the effectiveness of interventions aiming to increase adherence to blood pressure lowering medications in clients with high blood pressure found that simplification of dosing regimens increased adherence in seven out of nine studies with improvement of adherence ranging from 8 to 19.6 % (Schroeder, Fahey & Ebrahim, 2004). The authors concluded that introducing simpler dosing regimens could be effective in improving adherence. This recommendation is also supported by the work of Haynes et al. (2002) and McDonald, Garg & Haynes (2002) on adherence to prescribed therapy.

Some of the methods to simplify dosing regimens include the following:

- Once-a-day dosing (if possible);
- Tailor medication schedules to regular daily activities or events (e.g., brushing teeth, with meals, etc.);
- Encourage the use of medication reminders such as watch alarms, calendars, computer reminders; and
- Encourage the use of medication delivery systems such as dosettes, blister packaging.

Recommendation 4.6

Nurses will encourage routine and reminders to facilitate adherence.

Level of Evidence = Ia

Discussion of Evidence

Ogedegbe et al. (2004b) found that a common client identified reason for not taking medications was “forgetfulness”. Common explanations for forgetfulness cited in the literature included old age, waking up late, having a busy schedule, having to rush out of the house to make an early appointment, and “being away from home”. A systematic review (McDonald et al., 2002) found strong evidence to support cueing medication administration to daily events. Several authors and guidelines identify this strategy as a method to promote adherence (Johnson et al., 1999; CHEP 2004; NIH, 2003).

In summary, while no one intervention or combination of interventions exists to promote long-term adherence, a number of strategies have been identified in the literature and published guidelines (CHEP, 2004; McDonald et al., 2002, NIH, 2003). Nurses may find these strategies and a client-centred approach in promoting long-term adherence to be optimal.

Recommendation 4.7

Nurses will ensure that clients who miss appointments receive follow-up telephone calls in order to keep them in care.

Level of Evidence = IV

Discussion of Evidence

Missed appointments are correlated with lower adherence rates to prescribed regimens and are the first signal of dropping out of care entirely (Haynes et al., 2002). The authors of a 2005 Cochrane systematic review concluded that recalling clients who miss appointments as an effort to keep them in care is perhaps the single most important intervention to help clients follow prescriptions for medications (Haynes et al., 2002). Health professionals should monitor adherence to medical appointments. It may be useful to work with the interdisciplinary team to devise a clinic or office system whereby staff telephone clients to remind them of health appointments and to follow-up on appointments that are missed. This will provide an opportunity to assess potential barriers to adherence that may be interfering with a client’s treatment plan and to help to keep the client in care. Nurses who utilize telephone calls as part of their treatment and follow-up plan should do so in accordance with their scope of practice and according to the College of Nurses standards for providing telephone advice (CNO, 2004d).

⇨ **Practice Point:**

(Haynes et al., 2002; McDonald et al., 2002)

STRATEGIES	SPECIFIC APPROACHES
Counsel about the regimen	<ul style="list-style-type: none"> ■ Explain that more than one drug may be necessary (CHEP, 2004) ■ Explain that client will probably take medication for life (CHEP, 2004) ■ Ask client to bring all pill vials (including OTCs & herbal remedies) to all visits (CHEP, 2004)
Consider alternative medication delivery options	<ul style="list-style-type: none"> ■ Consider using a dosette or other medication delivery system ■ Consider switching medication packaging – from vial to blister packs (Takiya et al., 2004)
Cue medications to daily events	<ul style="list-style-type: none"> ■ Schedule and trigger pill taking according to daily activities (e.g., meals, brushing teeth) ■ Use beepers, reminder cards, phone reminders, computer reminders (Takiya et al., 2004) ■ Convenience of care (provide medications at work place) (CHEP, 2004; Takiya et al., 2004)
Monitor adherence to treatments and appointments	<ul style="list-style-type: none"> ■ Remind clients about medications and appointments ■ Call clients who have missed appointments for needed follow-up care (Haynes et al., 2002)
Reinforce the importance of high adherence at each visit and explicitly acknowledge efforts to adhere	<ul style="list-style-type: none"> ■ Take BP and talk about personal BP target at every available visit (CHEP, 2004) ■ Encourage Self BP monitoring with regular review and reinforcement
Involve family members and significant others (with clients' permission)	<ul style="list-style-type: none"> ■ Family members knowledge of the treatment plan and medication regimen can help promote adherence (Haynes et al., 2002)

Monitoring and Follow-Up

Blood pressure is the most obvious indicator for monitoring hypertension; however, monitoring should also include such factors as client engagement in the monitoring process, general health status and side effects of medication. Also, every client contact also provides an opportunity to discuss and encourage non-pharmacological (lifestyle) interventions to control blood pressure. Monitoring the client's adherence to both non-pharmacologic and pharmacologic interventions should be a component of follow-up visits, and may include (Haynes et al., 2002):

- Practical methods (apply to all clients):
 - Discussion with client
 - Treatment response
 - Attendance at appointments
- If applicable:
 - Drug levels
 - Pharmacy refills
 - Medication event monitors.

Recommendation 5.1

Nurses will advocate that clients who are on antihypertensive treatment receive appropriate follow-up, in collaboration with the healthcare team.

Level of Evidence = IV

Discussion of Evidence

Monitoring and follow-up can occur in a variety of settings including the clinic setting and in the home. Table 5 outlines the recommended frequency of monitoring for stable clients in the community based on the intervention, the client's physiological status and response. These recommendations **do not** apply to acute care situations.

Table 5: Blood pressure monitoring frequency recommendations (CHEP, 2004)

INTERVENTION	BP MONITORING FREQUENCY	COMMENTS
Lifestyle changes	Every 3-6 months	Monitoring every 1-2 months may be needed with a "high-normal" BP (130-139/85-89)
Drug therapy and lifestyle changes	Monthly, until target BP is met. Once blood pressure is stable with 2 consecutive BP readings below target, monitoring interval is every 3-6 months.	Shorter intervals may be required for severe HTN, intolerance of drug therapy, presence of target organ damage. Stable, normotensive clients should undertake self/home monitoring for one week every 3 months. See Figure 3, pg. 36 "Important points about self/home blood pressure monitoring".

The number of follow-up visits for treated clients after adequate blood pressure control is reached relies upon factors such as the severity of the hypertension, inconsistency of blood pressure ranges, complexity of the treatment regimen, client adherence and the requirement for non-pharmacological advice (Williams et al., 2004). Several sources recommend that a follow-up visit of every 3 to 6 months is adequate when blood pressure targets have been achieved (CHEP, 2004; NIH, 2003; Williams et al., 2004). The recent CHEP (2005) guidelines provide further clarity to the recommendations for follow-up (*Appendix P*).

The CHEP 2004 recommendations widely support that once antihypertensive drug therapy is initiated, necessary follow-up and adjustment of medications at one month intervals is required until the blood pressure goal is reached (refer to Recommendation 1.5 for target blood pressures). Furthermore, it is essential that individuals with Stage 2 hypertension (consistent with Grade 2 of the WHO/ISH classification) or with complicating co-morbid conditions, such as heart failure, receive more frequent follow-up visits (NIH, 2003). Table 6 outlines what to include in a follow-up visit.

Blood pressure clinics are held in a variety of locations in a community. These include retail pharmacies, hospitals, public health units, community health centers (CHCs), Family Health Networks, occupational health clinics and seniors' centers. Some faith-based nursing groups also support blood pressure checks/clinics for their parishioners. Nurses should become aware of the services available in the community and refer clients where appropriate.

Table 6: Follow-up of Medication Therapy

- a) Follow-up should include:
 - 1. Necessary blood work (serum potassium and creatinine, every 6-12 months) (NIH, 2003)
 - 2. Blood pressure measure and weight (SIGN, 2001)
 - 3. Enquiry regarding general health status, side effects and any treatment problems (SIGN, 2001)
 - 4. Reinforce or advise on non-pharmacological measure to control blood pressure (SIGN, 2001)
 - 5. Annual urine test for proteinuria (SIGN, 2001)
- b) With Stage 2 (consistent with Grade 2 of the WHO/ISH classifications) or complicated hypertension, clients require more frequent follow-up (NIH, 2003)

⇔ **Practice Point:**

Factors to consider when target blood pressure is not being reached (CHEP, 2005; SIGN, 2001):

- Difficulty following treatment regimen (e.g., complexity, socioeconomic barriers, psychological factors).
- Lifestyle (e.g., inability to lose weight, excessive alcohol intake).
- Treatment prescribed may be ineffective.
- Isolated clinic (white-coat) hypertension.
- Use of inappropriate cuff size.
- Use of drugs that raise blood pressure (e.g., NSAIDs, sympathomimetics, herbal remedies)
- Volume overload (e.g., high sodium intake, renal insufficiency, inadequate or ineffective diuretic therapy)
- Unsuspected secondary cause (e.g., renal or endocrine disorders, sleep apnea).

Documentation

Recommendation 6.1

Nurses will document and share comprehensive information regarding hypertension management with the client and healthcare team.

Level of Evidence = IV

Discussion of Evidence

Documentation in the health record is an integral component of effective and safe nursing practice. All data should be documented at the time of assessment, reassessment, or intervention and should include the client's response to nursing care. This documentation supports continuity of care and the ongoing monitoring of the client's progress towards their treatment goals.

Documentation that is clear, comprehensive and accurate is a record of the critical thinking and judgment used in professional nursing practice, and provides an account of nursing's unique contribution to healthcare (CNO, 2004a). Nursing documentation guides practice and provides information for all members of the interdisciplinary healthcare team and assists with continuity of care. It is also an essential component of quality improvement and risk management programs (Anderson, 2000). Sharing of information for communication of client care is within the context of the healthcare team directly involved in providing care to a client. Nurses need to be aware of what personal health information it is appropriate to share, with whom, and under what circumstances (CNO, 2004e).

Education Recommendation

Recommendation 7.1

Nurses working with adults with hypertension must have the appropriate knowledge and skills, acquired through basic nursing education curriculum, ongoing professional development opportunities and orientation to new work places. Knowledge and skills should include, at minimum:

- Pathophysiology of hypertension;
- Maximizing opportunities for detection;
- Facilitating diagnosis;
- Assessing and monitoring clients with hypertension;
- Providing appropriate client/family education;
- Supporting lifestyle changes;
- Promoting the empowerment of the individual; and
- Documentation and communication with the client and other members of the healthcare team.

Level of Evidence = IV

Specific areas of knowledge and skills include the following:

- Anatomy and physiology of hypertension, and factors that impact on blood pressure;
- Principles and application of adult learning theory;
- Principles and application of change theory;
- Appropriate technique for blood pressure assessment;
- Requirements for a diagnosis of hypertension;
- Requirements for monitoring;
- Interventions related to lifestyle modification;
- Medications prescribed for hypertension;
- Approaches to promote adherence to the recommended interventions; and
- Teaching and communication strategies (client and primary care provider).

Discussion of Evidence

Individuals with hypertension need regular follow-up care and support from healthcare professionals who are knowledgeable about hypertension and its management. In order to provide the necessary support and education to individuals with hypertension, nurses who are not specialists in this area require basic skills in these identified areas. Education of healthcare providers about hypertension best practices should address the knowledge, skill, judgment and attitudes necessary to implement the guideline recommendations.

Accurate measurement of blood pressure is essential to classify hypertension, to ascertain blood pressure-related risk, and to guide hypertension management. Pickering et al. (2005) emphasize that proper training of healthcare professionals is essential for accurate blood pressure readings. Nursing students, during their preparation for entry to practice, need to be provided with appropriate opportunities to develop skills in accurately assessing blood pressure.

The World Health Organization (2003) emphasizes the importance of professional education related to adherence for those working with clients requiring long term therapies. This education should address the following three topics (WHO, 2003):

- A. Adherence Information: A summary of the factors that have been reported to affect adherence, the effective interventions available, the epidemiology and economics of adherence and behavioural mechanisms driving client-related adherence.
- B. Behavioural tools for creating or maintaining habits: This component should be taught using “role-play” and other educational strategies to ensure that health professionals incorporate behavioural tools for enhancing adherence into their daily practice.
- C. Clinical: A useful way of using this information and thinking about adherence. This should encompass assessment tools and strategies to promote change. Any educational intervention should provide answers to the following questions: How should clients be interviewed to assess adherence? How can one learn from local factors and interventions? How should priorities be ranked and the best available interventions chosen? How should the clients’ progress be followed up and assessed?

Nurses are responsible to ensure that they have the knowledge, skill and judgment necessary to provide safe and effective hypertension care (CNO, 2004c). Organizations provide support by facilitating opportunities for nurses to develop their knowledge and skills in this clinical area. Continuing education is essential to sustain and advance nursing practice and is required of all nurses. *Appendix Q* provides a listing of educational resources to support professional education.

Organization & Policy Recommendations

Recommendation 8.1

Healthcare organizations will promote a collaborative practice model within the interdisciplinary team to enhance hypertension care and promote the nurses' role in hypertension management.

Level of Evidence = IV

Recommendation 8.2

Healthcare organizations will establish care delivery systems that allow for training in adherence management, as well as a means of accurately assessing adherence and those factors that contribute to it.

Level of Evidence = IV

Recommendation 8.3

Healthcare organizations will develop key indicators and outcome measurements that will allow them to monitor:

- the implementation of the guidelines;
- the impact of these guidelines on optimizing quality client care; and
- efficiencies, or cost effectiveness achieved.

Level of Evidence = IV

Recommendation 8.4

Nursing best practice guidelines can be successfully implemented only where there are adequate planning, resources, organizational and administrative support, as well as appropriate facilitation. Organizations may wish to develop a plan for implementation that includes:

- An assessment of organizational readiness and barriers to education.
- Involvement of all members (whether in a direct or indirect supportive function) who will contribute to the implementation process.
- Dedication of a qualified individual to provide the support needed for the education and implementation process.
- Ongoing opportunities for discussion and education to reinforce the importance of best practices.
- Opportunities for reflection on personal and organizational experience in implementing guidelines.

Level of Evidence = IV

Discussion of Evidence

Organizations must ensure that all healthcare professionals involved in providing hypertension care work in an environment that allows them to practice according to the guidelines and have access to appropriate assessment tools. Commitment to supporting the nurse's role in hypertension management requires a healthy work environment. Guideline implementation may be supported by:

- a critical mass of nurses educated and supported in guideline implementation;
- care delivery systems and adequate staffing that support the nurses' ability to implement these guidelines; and
- a sustained commitment to evidence-based practice in caring for those with hypertension.

For effective teamwork to take place, all team members need to feel valued within the team.

Health systems and providers need to develop means of accurately assessing not only adherence, but also those factors that contribute to it. Practitioners must have access to specific training in adherence management, and the systems in which they work must design and support delivery systems that respect this objective (WHO, 2003).

A critical initial step in the implementation of guidelines must be the formal adoption of the guidelines. Organizations need to consider how to formally incorporate the recommendations to be adopted into their policy and procedure structure (Graham, Harrison, Brouwers, Davies & Dunn, 2002). An example of such a formal adoption would be the establishment of a policy and procedure regarding the regular maintenance and calibration of blood pressure monitors within the practice setting. This initial step paves the way for general acceptance and integration of the guideline into such systems as the quality management process.

A commitment to monitoring the impact of the implementation of the *Nursing Management of Hypertension* best practice guideline is a key step that must not be omitted if there is to be an evaluation of the impact of the efforts associated with implementation. It is suggested that each recommendation to be adopted be described in measurable terms and that the healthcare team be involved in the evaluation and quality monitoring processes. A suggested list of evaluation indicators is provided later in this guideline.

New initiatives such as the implementation of a best practice guideline require strong leadership from nurses who are able to transform the evidence-based recommendations into useful tools that will assist in directing practice. In this regard, RNAO (through a panel of nurses, researchers and administrators) has developed the *Toolkit: Implementation of Clinical Practice Guidelines* (2002c) based on available evidence, theoretical perspectives and consensus. The *Toolkit* is recommended for guiding the implementation of the HSFO-RNAO best practice guideline *Nursing Management of Hypertension*. *Appendix R* provides a description of the *Toolkit*.

Research Gaps and Future Implications

The development panel, in reviewing the evidence for the development of this guideline, has identified several gaps in the research literature related to nursing interventions for hypertension management. In considering these gaps, they have identified the following priority research areas:

- Cost effectiveness of prevention of hypertension
- Effectiveness of targeting prevention interventions to various populations (children, adolescents, adults, family groups, etc.)
- Impact of socioeconomic factors on the development and control of hypertension
- Validation of an exercise assessment tool to be used by nurses
- Role of the nurse in counseling related to physical activity
- Effectiveness of client empowerment on individuals taking control of their disease
- Effectiveness of social support on client outcomes
- Effectiveness of client education by nurses on client outcomes
- Effectiveness of lifestyle interventions in men vs. women
- Effectiveness of decision aids on outcome and adherence
- Evaluation of the nurse's role in effecting change
- Effectiveness of nurse-led interventions for improving adherence
- Effectiveness of nurse-led hypertension management programs in improving adherence and blood pressure control
- Effectiveness of team approaches to adherence

The above list, although in no way exhaustive, is an attempt to identify and prioritize the research gaps in this area. Some of the recommendations in this guideline are based on evidence gained from qualitative or quantitative research, while others are based on consensus or expert opinion. Further substantive research is required in some areas to validate the expert opinion and impact knowledge that will lead to improved practice and outcomes for those with hypertension.

Evaluation/Monitoring of Guideline

Organizations implementing the recommendations in this nursing best practice guideline are advised to consider how the implementation and its impact will be monitored and evaluated. The following table, based on a framework outlined in the RAO *Toolkit: Implementation of Clinical Practice Guidelines* (2002c), illustrates some specific indicators for monitoring and evaluation of the guideline *Nursing Management of Hypertension*.

Level of Indicator	Structure	Process	Outcome
Objectives	To evaluate the supports available in the organization that allow for nurses to participate in hypertension management.	To evaluate changes in practice that lead towards improved blood pressure control.	To evaluate the impact of implementing the recommendations.
Organization	Review of best practice guideline recommendations by organizational committee(s) responsible for policies or procedures.	Review of policies and procedures related to hypertension management.	Documented policies and procedures related to management of hypertension are consistent with the guideline recommendations.
	Availability of accessible hypertension prevention and treatment services.	Access to follow-up services that include a range of appointment times, ease of access (parking, location) and culturally appropriate care.	Increased rates of utilization of follow-up services.
	Access to appropriate and well-maintained/calibrated BP monitoring equipment for staff and client use.	Processes are in place to ensure equipment used for BP monitoring meets applicable criteria for validity, and is well-maintained/calibrated.	All staff and clients utilize appropriate and well-maintained/calibrated equipment.
Nurse	Availability of educational opportunities for nurses related to detection, assessment, and development of a treatment plan, management and ongoing monitoring of hypertension.	Percentage of nurses attending educational sessions re. hypertension management.	Nurses display increased ability to facilitate client behavioural change, advocate for the client and to intervene in blood pressure management.
	Evaluation structures are in place to monitor effectiveness of educational programs for nurses.	Nurses self-assessed knowledge of: <ul style="list-style-type: none"> ■ Technique for assessing blood pressure; ■ Lifestyle interventions; ■ Assessing client social support; ■ Medication regimens; ■ Assessing finances related to drug coverage; ■ Follow-up schedule. 	Documented evidence in clients health record reflects nursing assessment/intervention related to hypertension management.
Client	Availability of client educational opportunities related to hypertension self-management.	Percentage of clients attending/participating in educational opportunities.	Clients demonstrate knowledge re. their disease process, the purpose of their medications, appropriate medication schedules, lifestyle modifications and need for regular follow-up. Clients have improved blood pressure control.
Financial Costs	Provision of adequate financial and human resources for guideline implementation.		Optimal investment of resources related to hypertension management.

The development panel identified several system level indicators that impact on the nursing management of hypertension. These include:

- Pharmaceutical companies manufacture medications/packaging in user-friendly ways to facilitate medication adherence.
- Models of healthcare delivery that enable and empower multi-disciplinary teams and clients.
- Payment structures that do not pose a barrier to meeting client's holistic needs.

Implementation Strategies

The Registered Nurses' Association of Ontario and the guideline development panel have compiled a list of implementation strategies to assist healthcare organizations or healthcare disciplines who are interested in implementing this guideline. A summary of these strategies follows:

- Have at least one dedicated person such as an advanced practice nurse or a clinical resource nurse who will provide support, clinical expertise and leadership. The individual should also have good interpersonal, facilitation and project management skills.
- Conduct an organizational needs assessment related to hypertension management to identify current knowledge base and further educational requirements.
- Initial needs assessment may include an analysis approach, survey and questionnaire, group format approaches (e.g., focus groups), and critical incidents.
- Establish a steering committee comprised of key stakeholders and interdisciplinary members committed to lead the change initiative. Identify short term and long term goals. Keep a work plan to track activities, responsibilities and timelines.
- Create a vision to help direct the change effort and develop strategies for achieving and sustaining the vision.
- Program design should include:
 - Target population;
 - Goals and objectives;
 - Outcome measures;
 - Required resources (human resources, facilities, equipment); and
 - Evaluation activities.
- Design educational sessions and ongoing support for implementation. The education sessions may consist of presentations, facilitator's guide, handouts and case studies. Binders, posters and pocket cards may be used as ongoing reminders of the training. Plan education sessions that are interactive, include problem solving, address issues of immediate concern and offer opportunities to practice new skills (Davies & Edwards, 2004).
- Provide organizational support such as having the structures in place to facilitate the implementation. For example, hiring replacement staff so participants will not be distracted by concerns about work and having an organizational philosophy that reflects the value of best practices through policies and procedures. Develop new assessment and documentation tools (Davies & Edwards, 2004).
- Identify and support designated best practice champions on each unit to promote and support implementation. Celebrate milestones and achievements, acknowledging work well done (Davies & Edwards, 2004).
- Organizations implementing this guideline should adopt a range of self-learning, group learning, mentorship and reinforcement strategies that will over time, build the knowledge and confidence of nurses in implementing this guideline.

- Beyond skilled nurses, the infrastructure required to implement this guideline includes access to specialized equipment and treatment materials. Orientation of the staff to the use of specific products and technologies must be provided and regular refresher training planned.
- Teamwork, collaborative assessment and treatment planning with the client and family and interdisciplinary team are beneficial in implementing guidelines successfully. Referral should be made as necessary to services or resources in the community or within the organization.

In addition to the strategies mentioned above, the RNAO has developed resources that are available on the website. A *Toolkit* for implementing guidelines can be helpful if used appropriately. A brief description about this *Toolkit* can be found in *Appendix R*. A full version of the document in pdf format is also available at the RNAO website, www.rnao.org/bestpractices.

Process for Update/Review of Guideline

The Registered Nurses' Association of Ontario proposes to update this best practice guideline as follows:

1. Each nursing best practice guideline will be reviewed by a team of specialists (Review Team) in the topic area every three years following the last set of revisions.
2. During the three-year period between development and revision, RNAO program staff will regularly monitor for new systematic reviews and randomized controlled trials and other relevant literature in the field. In addition, RNAO program staff will review the annual updates of the Canadian Hypertension Education Program for new evidence that may impact on the recommendations in this guideline. Any required updates will be provided as supplements on the RNAO/HSFO websites.
3. Based on the results of the monitor, program staff will recommend an earlier revision period. Appropriate consultation with a team of members comprising original panel members and other specialists in the field will help inform the decision to review and revise the guidelines earlier than the three-year milestone.
4. Three months prior to the three year review milestone, the program staff will commence the planning of the review process by:
 - a) Inviting specialists in the field to participate in the Review Team. The Review Team will be comprised of members from the original panel as well as other recommended specialists.
 - b) Compiling feedback received, questions encountered during the dissemination phase as well as other comments and experiences of implementation sites.
 - c) Compiling new clinical practice guidelines in the field, systematic reviews, meta-analysis papers, technical reviews, randomized controlled trial research, and other relevant literature.
 - d) Developing detailed work plan with target dates and deliverables.

The revised guideline will undergo dissemination based on established structures and processes.

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- Yung, P., French, P., & Leung, B. (2001). Relaxation training as complementary therapy for mild hypertension control and the implications of evidence-based medicine. *Complementary Therapies in Nursing & Midwifery*, 7(2), 59-65.
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Appendix A: Search Strategy for Existing Evidence

The search strategy utilized during the development of this guideline focused on two key areas. One was the identification of clinical practice guidelines published on the topic of hypertension management, and the second was to identify systematic reviews and primary studies published in this area from 1995 to 2004.

STEP 1 – DATABASE Search

A database search for existing evidence related to hypertension management was conducted by a university health sciences library. An initial search of the MEDLINE, Embase and CINAHL databases for guidelines and studies published from 1995 to 2004 was conducted in November 2004. This search was structured to answer the following questions:

- How can nurses accurately detect symptoms of hypertension in the adult population?
- What effective treatment interventions can nurses utilize in practice to decrease blood pressure?

Detailed search strings developed to address these questions are available on the RNAO website at www.rnao.org/bestpractices

STEP 2 – Structured Website Search

One individual searched an established list of websites for content related to the topic area in September 2004. This list of sites, reviewed and updated in May 2004, was compiled based on existing knowledge of evidence-based practice websites, known guideline developers, and recommendations from the literature. Presence or absence of guidelines was noted for each site searched as well as date searched. The websites at times did not house guidelines, but directed to another website or source for guideline retrieval. Guidelines were either downloaded if full versions were available or were ordered by phone/email.

- Agency for Healthcare Research and Quality: <http://www.ahrq.gov>
- Alberta Heritage Foundation for Medical Research – Health Technology Assessment: <http://www.ahfmr.ab.ca/hta>
- Alberta Medical Association – Clinical Practice Guidelines: <http://www.albertadoctors.org>
- American College of Chest Physicians: <http://www.chestnet.org/guidelines>
- American Medical Association: <http://www.ama-assn.org>
- Bandolier Journal: <http://www.jr2.ox.ac.uk/bandolier>
- British Columbia Council on Clinical Practice Guidelines: <http://www.hlth.gov.bc.ca/msp/protoguides/index.html>
- British Medical Journal – Clinical Evidence: <http://www.clinicalevidence.com/ceweb/conditions/index.jsp>
- Canadian Centre for Health Evidence: <http://www.cche.net/che/home.asp>
- Canadian Cochrane Network and Centre: <http://cochrane.mcmaster.ca>
- Canadian Coordinating Office for Health Technology Assessment: <http://www.ccohta.ca>
- Canadian Institute of Health Information: <http://www.cihi.ca>
- Canadian Task Force on Preventive Health Care: <http://www.ctfphc.org>
- Centers for Disease Control and Prevention: <http://www.cdc.gov>

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- Centre for Evidence-Based Mental Health: <http://cebmh.com>
- Centre for Evidence-Based Nursing: <http://www.york.ac.uk/healthsciences/centres/evidence/cebn.htm>
- Centre for Evidence-Based Pharmacotherapy: <http://www.aston.ac.uk/lhs/teaching/pharmacy/cebp>
- Centre for Health Evidence: <http://www.cche.net/che/home.asp>
- Centre for Health Services and Policy Research: <http://www.chspr.ubc.ca>
- Clinical Resource Efficiency Support Team (CREST): <http://www.crestni.org.uk>
- CMA Infobase: Clinical Practice Guidelines: <http://mdm.ca/cpgsnew/cpgs/index.asp>
- Cochrane Database of Systematic Reviews: <http://www.update-software.com/cochrane>
- Database of Abstracts of Reviews of Effectiveness (DARE): <http://www.york.ac.uk/inst/crd/darehp.htm>
- Evidence-based On-Call: <http://www.eboncall.org>
- Guidelines Advisory Committee: <http://gacguidelines.ca>
- Institute for Clinical Evaluative Sciences: <http://www.ices.on.ca>
- Institute for Clinical Systems Improvement: <http://www.icsi.org/index.asp>
- Institute of Child Health: <http://www.ich.ucl.ac.uk/ich>
- Joanna Briggs Institute: <http://www.joannabriggs.edu.au>
- Medic8.com: <http://www.medic8.com/ClinicalGuidelines.htm>
- Medscape Women's Health: <http://www.medscape.com/womenshealthhome>
- Monash University Centre for Clinical Effectiveness: <http://www.med.monash.edu.au/healthservices/cce/evidence>
- National Guideline Clearinghouse: <http://www.guidelines.gov>
- National Institute for Clinical Excellence (NICE): <http://www.nice.org.uk>
- National Library of Medicine Health Services/Technology Assessment Test (HSTAT):
<http://hstat.nlm.nih.gov/hq/Hquest/screen/HquestHome/s/64139>
- Netting the Evidence: A SchARR Introduction to Evidence-Based Practice on the Internet:
<http://www.shef.ac.uk/scharr/ir/netting>
- New Zealand Guidelines Group: <http://www.nzgg.org.nz>
- NHS Centre for Reviews and Dissemination: <http://www.york.ac.uk/inst/crd>
- NHS Nursing & Midwifery Practice Dev. Unit: <http://www.nmpdu.org>
- NHS R & D Health Technology Assessment Programme: <http://www.hta.nhsweb.nhs.uk/htapubs.htm>
- NIH Consensus Development Program: <http://consensus.nih.gov/about/about.htm>
- PEDro: The Physiotherapy Evidence Database: <http://www.pedro.fhs.usyd.edu.au/index.html>
- Queen's University at Kingston: <http://post.queensu.ca/~bhc/gim/cpgs.html>
- Royal College of General Practitioners: <http://www.rcgp.org.uk>
- Royal College of Nursing: <http://www.rcn.org.uk/index.php>
- Royal College of Physicians: <http://www.rcplondon.ac.uk>
- Sarah Cole Hirsh Institute – Online Journal of Issues in Nursing: <http://fpb.cwru.edu/HirshInstitute>
- Scottish Intercollegiate Guidelines Network: <http://www.sign.ac.uk>
- Society of Obstetricians and Gynecologists of Canada Clinical Practice Guidelines:
http://www.sogc.medical.org/sogcnet/index_e.shtml
- SUMSearch: <http://sumsearch.uthscsa.edu>

- The Qualitative Report: <http://www.nova.edu/ssss/QR>
- Trent Research Information Access Gateway: <http://www.shef.ac.uk/scharr/triage/TRIAGEindex.htm>
- TRIP Database: <http://www.tripdatabase.com>
- U.S. Preventive Service Task Force: <http://www.ahrq.gov/clinic/uspstfix.htm>
- University of California, San Francisco: <http://medicine.ucsf.edu/resources/guidelines/index.html>
- University of Laval – Directory of Clinical Information Websites: <http://132.203.128.28/medecine>

STEP 3 – Search Engine Web Search

In addition, a website search for existing practice guidelines on hypertension management was conducted via the search engine “Google”, using key search terms. One individual conducted this search, noting the results of the search, the websites reviewed, date and a summary of the results. The search results were further reviewed by a second individual who identified guidelines and literature not previously retrieved.

STEP 4 – Hand Search/Panel Contributions

Panel members were asked to review personal archives to identify guidelines not previously found through the above search strategy.

SEARCH RESULTS:

The search strategy described above resulted in the retrieval of 708 abstracts on the topic of hypertension. These abstracts were then screened by a research assistant in order to identify duplications and assess for inclusion/exclusion criteria. The resulting abstracts were included on a short list for article retrieval, quality appraisal and data summary.

In addition, 12 clinical practice guidelines were identified that met the screening criteria (see page 17) and were critically appraised using the Appraisal of Guidelines for Research and Evaluation Instrument (AGREE Collaboration, 2001).

Canadian Hypertension Society (2004)

- Hemmelgarn, B., Zarnke, K., Campbell, N., Feldman, R., McKay, D., McAlister, F. et al. (2004). The 2004 Canadian Hypertension Education Program recommendations for the management of hypertension: Part I – Blood pressure measurement, diagnosis and assessment of risk. *Canadian Journal of Cardiology*, 20(1), 31-40.
- Khan, N., McAlister, F., Campbell, N., Feldman, R., Rabkin, S., Mahon, J. et. al. (2004). The 2004 Canadian Hypertension Education Program recommendations for the management of hypertension: Part II – Therapy. *Canadian Journal of Cardiology*, 20(1), 41-54.
- Touyz, R., Campbell, N., Logan, A., Gledhill, N., Petrella, R., Padwal, R. et al (2004). The 2004 Canadian Hypertension Education Program recommendations for the management of hypertension: Part III – Lifestyle modifications to prevent and control hypertension. *Canadian Journal of Cardiology*, 20(1), 55-9.

Canadian Medical Association (CMA, 1999):

- Feldman, R., Campbell, N., Larochelle, P., Bolli, P., Burgess, E., Carruthers, S. et al. (1999). 1999 Canadian recommendations for the management of hypertension. *Canadian Medical Association Journal*, 161(12 Suppl), S1-S22.
- Canadian Medical Association (1999). Lifestyle modifications to prevent and control hypertension. *Canadian Medical Association Journal*, 160(9 Suppl), S1-S50.

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European Society of Hypertension (2003). European Society of Cardiology guidelines for the management of arterial hypertension. Retrieved [Electronic Version] from: www.hyp.ac.uk/bhs/pdfs/EHS_2003_guidelines.pdf

Health Canada and the Canadian Coalition for High Blood Pressure Prevention and Control (2000). National high blood pressure prevention and control strategy: Summary report of the expert working group. Retrieved [Electronic Version] from: www.phac-aspc.gc.ca/ccdpc-cpcmc/cvd-mcv/publications/pdf/strate.pdf

Institute of Clinical Systems Improvement (2004). Health care guideline: Hypertension diagnosis and treatment. Retrieved [Electronic Version] from: www.icsi.org

National Institute for Clinical Excellence (2004). Management of hypertension in adults in primary care. Retrieved [Electronic Version] from: www.nice.org.uk/page.aspx?o=217968

National Institutes of Health (2003). The seventh report of the Joint National Committee: Prevention, detection, evaluation and treatment of high blood pressure. JNC 7. Retrieved [Electronic Version] from: www.nhlbi.nih.gov/guidelines/hypertension/express.pdf

Scottish Intercollegiate Guidelines Network (2001). Hypertension in older people: A national clinical guideline. Retrieved [Electronic Version] from: www.sign.uk

Veterans Health Administration, Department of Defence (1999). VHA/DOD clinical practice guideline for diagnosis and management of hypertension in the primary care setting. Retrieved [Electronic Version] from: www1.va.gov/health/hypertension/HTN.doc

Williams, B., Poulter, N., Brown, M., Davis, M., McInnes, G., Potter, J. et al. (2004). Guidelines for management of hypertension: Report of the fourth working party of the British Hypertension Society. *Journal of Human Hypertension*, 18(3), 139-185.

World Health Organization (2003). 2003 World Health Organization/International Society of Hypertension statement on the management of hypertension. *Journal of Hypertension*, 21(11), 1983-1992.

After the AGREE review process was underway, the Canadian Hypertension Education Program published the 2005 CHEP guidelines in January 2005, and these were subsequently incorporated into the guideline development process:

- Canadian Hypertension Society (2005). The 2005 Canadian Hypertension Education Program Recommendations. Retrieved [Electronic Version] from: www.hypertension.ca/recommend_body2.asp
- Hemmelgarn, B., McAlister, F., Myers, M., McKay, D., Bolli, P., Abbott, C. et al. (2005). The 2005 Canadian Hypertension Education Program for the management of hypertension: Part I – Blood pressure measurement, diagnosis and assessment of risk. *Canadian Journal of Cardiology*, 21(8), 645-656.
- Khan, N., McAlister, F., Lewanczuk, R., Touyz, R., Padwal, R., Rabkin, S., et al. (2005). The 2005 Canadian Hypertension Education Program for the management of hypertension: Part II – Therapy *Canadian Journal of Cardiology*, 21(8), 657-672.

Appendix B: Glossary of Clinical Terms

Angiotensin Converting Enzyme (ACE) inhibitors: A class of medication that reduces blood pressure by preventing the production of angiotensin II by blocking the action of angiotensin converting enzyme.

Angiotensin II Receptor Blockers (ARBs): A class of medication that helps relax blood vessels and reduce blood pressure by blocking the action of angiotensin II.

Beta-adrenergic Antagonists: A class of medication that slows the heart rate and lowers blood pressure. These drugs are used to prevent angina pectoris, to reduce the risk of a second heart attack and to treat congestive heart failure. Also known as beta-blockers or β -blockers.

Calcium Channel Blockers: A class of medication that keeps calcium from entering the muscle cells of the heart and blood vessels. This relaxes muscles in the walls of blood vessels and reduces blood pressure. Some of these medications also slow the heart rate. Also called calcium antagonists.

Calibration: A procedure to ensure that blood pressure measurements begin from zero in aneroid or electronic blood pressure monitors. If the starting mark is above or below zero, the final measurement will be inaccurate (Lewis, 2002).

DASH diet: An eating plan that evolved out of a research study called Dietary Approaches to Stop Hypertension (DASH). The study found that eating a diet high in fruits, vegetables, and lowfat dairy foods (while also being low in total fat, saturated fat, and cholesterol) caused significant reductions in blood pressure.

Diuretics: A class of medication that helps the body eliminate excess sodium and water. With excess sodium and water removed, the body's fluid volume and blood pressure are lowered.

Korotkoff Sounds: The blood flow is stopped during the inflating of the cuff during the taking of a blood pressure, and the artery is silent. As blood begins to spurt through the compressed artery (with the release of pressure), the turbulent flow is audible. The vibrations in the artery walls are called Korotkoff sounds. The sounds are divided into five phases based on the loudness and quality of the sounds:

Phase 1 Loud clear tapping or snapping sounds are heard. They grow louder as the cuff is deflated.

Phase 2 A succession of murmurs is heard. Sounds may disappear during this phase if the cuff is deflated too slowly.

Phase 3 The sounds become louder and have thumping quality similar to phase 1.

Phase 4 The thumping sounds of phase 3 are abruptly replaced by a muffled sound.

Phase 5 All sounds disappear. This phase is absent in some people.

Metabolic Syndrome: A combination of risk factors for heart disease, including high blood sugar (glucose intolerance), high blood pressure, high triglycerides, low levels of high-density lipoprotein (HDL) cholesterol and abdominal obesity.

Motivational Interviewing: Motivational interviewing is a focused, goal directed client-centred counseling style for eliciting behaviour change by helping clients explore and resolve ambivalence (Miller & Rollnick, 1991; Rollnick & Miller, 1995).

Self-efficacy: An individual's belief that she or he is capable of dealing with a specific problem. Low self-efficacy results in avoiding changing behaviour, whereas high self-efficacy promotes change in behaviour (Betz & Hackett, 1998).

Sphygmomanometer: An instrument for measuring blood pressure in the arteries that consists of a pressure gauge and a rubber cuff that wraps around the upper arm and inflates to constrict the arteries.

Aneroid means “no liquid”, and in the context of a sphygmomanometer, aneroid implies that there is a spring mechanism with a numbered dial to measure cuff pressure.

Mercury manometer is one that uses a column of mercury to measure cuff pressure.

Electronic device (digital manometer) is a blood pressure monitor that uses an electronic device to detect the movement (oscillation) in the artery wall with each heartbeat to measure blood pressure.

Sympathomimetics: A class of medications whose properties mimic those of a stimulated sympathetic nervous system. As such, they increase cardiac output, dilate bronchioles, and usually produce constriction of blood vessels.

Validation Protocols: Automated devices that meet the standards of the AAMI, the BHS or the International Protocol are considered validated (Pickering et al., 2005):

Association for the Advancement of Medical Instrumentation (AAMI, 2002). The Association for the Advancement of Medical Instrumentation (AAMI) protocol is a formal validation protocol used for automated monitors providing a readout of systolic and diastolic pressure. It requires the device be tested against two trained human observers in 85 subjects.

British Hypertension Society Protocol (BHS, 1993). The BHS Protocol is a formal validation protocol used for automated monitors providing a readout of systolic and diastolic pressure. It requires the device be tested against two trained human observers in 85 subjects.

International Protocol. The International Protocol (ESH, 2002) is a formal validation protocol developed by a group of experts with the European Society of Hypertension Working Group on Blood Pressure Monitoring. This protocol was developed to replace the BHS and AAMI protocols and is easier to perform. It requires comparison of the device readings (four in all) alternating with five mercury readings taken by two trained observers.

See *Appendix Q* for additional information about these validation protocols.

Appendix C: Medication Costs and Programs

The cost of prescription medications is a significant barrier for many Ontarians without drug coverage through the Ontario Drug Benefits Program or third party drug plans. Cost may be a deciding factor when developing an antihypertensive treatment plan. The following overview provides details regarding the costs associated with common classes of antihypertensive therapy, and provides information on programs available to assist clients with prescription medication costs.

Antihypertensive drugs within a particular medication class have a range of retail prices. Some drugs have flat pricing across a dose, others have incremental pricing per dose. Detailed cost per dose information for drugs can be found at the Ontario Drug Benefit Formulary/Comparative Drug Index. This is a searchable e-formulary:

http://www.health.gov.on.ca/english/providers/program/drugs/odbf_mn.html

An example of the cost of a drug within each medication class prescribed for hypertension is provided in the table below:

CLASS	DRUG NAME	COST/DAY
Thiazide Diuretics	Hydrochlorothiazide 25 mg	\$0.006 per day
Beta-Blockers	Atenolol 50 mg	\$0.35 per day
Angiotensin Converting Enzyme (ACE) Inhibitors	Ramipril 10 mg	\$0.95 per day
Angiotensin II Receptor Blockers (ARBs)	Candesartan 8 or 16 mg	\$1.08 per day
Long-acting Calcium Channel Blockers (CCBs)	Amlodipine 10 mg	\$1.90 per day

(Prices are current as of June 2005)

Refer to *Appendix O* for a summary of medication classes prescribed for hypertension.



The Ontario Drug Benefit Program

The following individuals are eligible for drug coverage under the Ontario Drug Benefits Program (ODB):

- people 65 years of age and older;
- residents of long-term care facilities;
- residents of Homes for Special Care;
- people receiving professional services under the Home Care program;
- Trillium Drug Program recipients; and
- Individuals receiving financial assistance through Ontario Works or the Ontario Disability Support Program (ODSP).

Additional details on this program are available at:

<http://www.health.gov.on.ca/english/public/pub/drugs/odb.html>

The Trillium Drug Benefits Plan

The Trillium Drug Benefits Plan helps people who have high drug costs in relation to their income. The Trillium Drug Benefits Plan covers over 3,400 prescription drug products, over 400 limited use drug products, as well as some nutritional and diabetic testing products. Those receiving benefits are required to pay a deductible that is based on income and family size.

Eligibility criteria include:

- private insurance does not cover 100% of prescription drug costs;
- valid Ontario Health Insurance (OHIP); and
- **not** eligible for drug coverage under the Ontario Drug Benefit Program (ODBP).

How to apply:

- Application kits are available at local pharmacies or by calling the Ministry of Health and Long-Term Care Infoline at 1-800-268-1154.

Additional details on this program are available at:

<http://www.health.gov.on.ca/english/public/pub/drugs/trillium.html>

Options for clients who do not have drug coverage:

- Consider a referral to hospital/clinic social worker to assist in finding options;
- Consider a referral to a Community Care Access Centre (CCAC) if the client meets the eligibility criteria;
- Explore coverage under the Employment Insurance (EI) program;
- Consider application to Ontario Works, if the client qualifies;
- Contact the pharmaceutical company to explore the option of a compassionate supply.

Appendix D: Stages of Change Model

Prochaska and DiClemente's Stages of Change Model

Stage of Change	Characteristics	Goal	Techniques
Pre-contemplation	<ul style="list-style-type: none"> ■ Unaware or unwilling to change. ■ Not thinking of making a change in the next 6 months. 	<ul style="list-style-type: none"> ■ To help the client think seriously about making a change. 	<ul style="list-style-type: none"> ■ Validate lack of readiness. ■ Clarify: decision is theirs. ■ Encourage re-evaluation of current behaviour. ■ Encourage self-exploration, not action. ■ Explain and personalize the risk.
Contemplation	<ul style="list-style-type: none"> ■ Ambivalent about change: "Sitting on the fence." ■ Thinking about making a change within 6 months. 	<ul style="list-style-type: none"> ■ To help client move towards a decision to change behaviour. ■ To help client feel more confident. 	<ul style="list-style-type: none"> ■ Validate lack of readiness. ■ Clarify: decision is theirs. ■ Encourage evaluation of pros and cons of behaviour change. ■ Identify and promote new, positive outcome expectations.
Preparation	<ul style="list-style-type: none"> ■ Some experience with change and are trying to change: "Testing the waters." ■ Planning to act within 1 month. ■ Have set a date to start behaviour change. ■ Have made a 24 hour attempt to change in the last 12 months. 	<ul style="list-style-type: none"> ■ To help client prepare for and anticipate positively a "start date." 	<ul style="list-style-type: none"> ■ Identify and assist in problem solving re: obstacles. ■ Help client identify social support. ■ Verify that client has underlying skills for behaviour change. ■ Encourage small initial steps.
Action	<ul style="list-style-type: none"> ■ Practicing new behaviour within the past 6 months and are actively applying skills for behaviour change. 	<ul style="list-style-type: none"> ■ To help client maintain behaviour change and recover from relapses. 	<ul style="list-style-type: none"> ■ Focus on restructuring cues and social support. ■ Bolster self-efficacy for dealing with obstacles. ■ Combat feelings of loss and reiterate long-term benefits.
Maintenance	<ul style="list-style-type: none"> ■ Continued commitment to sustaining new behaviour, and integrating this behaviour into daily routine. ■ Post-6 months. 	<ul style="list-style-type: none"> ■ To help client sustain new behaviour for a lifetime. 	<ul style="list-style-type: none"> ■ Plan for follow-up support. ■ Reinforce internal rewards. ■ Discuss coping with relapse.
Relapse	<ul style="list-style-type: none"> ■ Resumption of old behaviours. ■ A normal event in the process of making behaviour change. 	<ul style="list-style-type: none"> ■ To help client recognize that each attempt offers new opportunities to learn new skills and techniques to help them be successful in their next attempt. 	<ul style="list-style-type: none"> ■ Evaluate trigger for relapse. ■ Reassess motivation and barriers. ■ Plan stronger coping strategies.

Canadian Council on Smoking and Health (2003). *Guide your patients to a smoke-free future: A program of the Canadian Council on Smoking and Health*. Ottawa, Ontario: Canadian Council on Smoking and Health.

Prochaska, J.O. & DiClemente, C. (1983). Stages and processes of self-change of smoking. Toward an integrative model of change. *Journal of Counselling and Clinical Psychology*, 51(3), 390-395.

UCLA Centre for Human Nutrition (2004). Prochaska and DiClemente's Stages of Change Model. Retrieved [Electronic Version] from: http://www.cellinteractive.com/ucla/physician_ed/stages_change.html

University of Toronto Department of Family & Community Medicine (2000). *Project CREATE: Smoking cessation module*. (Vol 3). Toronto, Ontario: Project CREATE.

Appendix E: Motivational Interviewing

Motivational Interviewing is a focused, goal directed client-centred counseling style for eliciting behaviour change by helping clients explore and resolve ambivalence (Miller & Rollnick, 1991; Rollnick & Miller, 1995). To enhance motivation and change, motivational interviewing, through an assessment of the change process, systematically directs the client toward motivation for change; offers advice and feedback where appropriate, selectively uses empathic reflection to reinforce certain processes, and seeks to elicit and amplify the client's discrepancies about their unhealthy behaviour(s). Motivational interviewing is facilitative rather than coercive and tentatively challenging rather than directly confrontational. The strategies support the client through the change process by fostering self-reflection rather than arguments between practitioner and client (Botelho & Skinner, 1995).

Searching for a method to facilitate behaviour change in clients with substance abuse, psychologists William Miller and Stephen Rollnick developed motivational interviewing. Behaviour change should be negotiated, not dictated. Healthcare practitioners do not motivate clients, but assess motivation and apply the appropriate skills and strategies to address readiness to change. This point is critical. Clients vary in their readiness to change a behaviour (e.g., take medications, make lifestyle changes) and must be assessed to determine how prepared they are to do what is needed to integrate change into their lives. How important do they think the changes are? Are they confident they can do so? Will they need help? Do they understand the benefits? What barriers do they perceive? How will they reduce them? By assessing the degree of readiness, nurses can choose specific communication skills and appropriate strategies to facilitate change. This is the heart of motivational interviewing (Berger, 2004a,b). The role of the nurse is to understand and accept, in a non-judgmental way, clients' needs and concerns and not be coercive by trying to talk them in or out of these behaviours. This will create a favourable and supportive climate for change – problems are attacked, not people.

Motivational interviewing, designed to take 3-5 minutes per session, is a psychosocial or socio-behavioural approach to client care that contrasts with the traditional biomedical approach. The psychosocial model is client-centred and stresses that the client's needs and concerns must be appropriately addressed; otherwise, non-adherence may occur. Asking if there are questions or concerns the client may have about the illness or treatments is a positive way of assessing this possibility. The psychosocial model also views the encounter between client and healthcare provider as a meeting of experts. The nurse or other healthcare providers may be an expert on disease management, but clients are experts on themselves and how they will be affected by the proposed changes in their lives. It is the client's decision (with input from healthcare providers) to choose healthy or unhealthy behaviours. Clients manage their illness, not nurses. However, nurses can create an environment through caring, sufficient information, and understanding to improve the chance that the client will manage their illness effectively (Berger, 2004a,b).

Change and resistance are opposite sides of the same coin. Change often evokes resistance because change inherently questions one's motivation and ability to do what is needed. If the pros of the change outweigh the cons, clients will make the change. Alternatively, ambivalence kills change. When people are ambivalent, they do nothing. The pros and cons of the change seem the same. Some examples of ambiguity are: client doubts that the medication will actually work; they are unclear about what to do; or if they doubt they have the necessary skills. Resistance is information and provides insight into what the person is thinking and

feeling: “I need to explore this and see if it works for me.” Exploring and understanding what has been said with the client, not persuasion or criticism, are the keys to managing resistance. If nurses try to move people too quickly toward a behaviour change, they will dig in and resist. An appropriate response to a client who indicates that he/she does not want to take a medication would be: “What bothers you the most about taking this medicine?” This way the client can explain their reasoning, and the nurse can specifically address his/her concern.

Motivational interviewing creates dissonance in a person. Dissonance, or an inconsistency between two behaviours (attitudes, values, etc.), creates a discomfort that, in itself, can be motivating. For example, if a person’s attitudes are inconsistent with their behaviours, dissonance occurs. Dissonance is uncomfortable and the person may be motivated to explore ways to reduce this uncomfortable feeling.

The spirit of motivational interviewing is collaboration, evocation and autonomy. Healthcare professionals using this approach desire a relationship with the client in which they can collaborate on mutually agreed upon goals. Questions are asked to determine and understand the client’s resistance or ambivalence – the client knows the answers, not the healthcare provider. Additionally, clients must make informed choices. It is not enough to simply provide information. One needs to evaluate that the client has understood the information, knows how to use it, and has a feeling of self-efficacy or confidence in their ability to do what is needed. This includes assessing the client’s understanding of the illness and its treatment.

How does motivational interviewing work?

Motivational interviewing uses the general process of elicit-provide-elicit. The nurse elicits information from clients to better understand who they are and what they already know about the illness and its management interventions. This is done to facilitate clients’ movement forward with the treatment plan. Then, nurses elicit information again to check for concerns or questions resulting from the new information.

Motivational interviewing uses *five principles or counseling techniques* to assess and create motivation within the client (Berger, 2004a,b; Miller & Rollnick, 1991; Smith, Heckemeyer, Kraft & Mason, 1997).

- 1. Express empathy** – Empathy is defined as the “ability of the provider to accurately reflect what the client is saying” (Moyers, 2000; p.155). Empathy is an objective identification with the affective state of another (not his or her experience) – nurses identify with the client’s affect (emotions), not with the experience. Empathetic responding, through active listening, helps identify and understand resistance and reasons for unhealthy behaviours (or non-adherence). For example, your client smokes and you are advising him to quit. You ask him what he likes about smoking, and he says it relaxes him. Instead of creating defensiveness by asking, “Can’t you think of something else to relax you?” you state empathetically, “It would be difficult to give up something that was relaxing.” As a result, the client sees you as an advocate, and is in a better position to hear what you have to say.
- 2. Avoid arguments** – By avoiding arguments, the client is more likely to see the healthcare provider as being on his/her side. It is important to note that motivational interviewing is confrontational; however, it should not be argumentative or judgmental. For example, “Mrs. Jones, I see that you have been getting your refills about every 40 days or so, but you receive only a 30-day supply. Can you tell me what happened?” Also, it should be noted that feelings a client may express (e.g., fear or concern) are not arguable but real for the client.

3. **Develop discrepancy (dissonance)** – Creating dissonance can be achieved in two major ways. The goal is to elicit from the client those aspects of his or her life that are important but may be compromised because of the behaviour. For example, the client may say that he or she enjoys going to the bar and drinking with his or her friends for most of the weekend, and how he or she hates taking medication especially those that do not make him or her feel well. In the next sentence, he or she may add that since he or she was diagnosed as having high blood pressure, he or she is very worried about having a stroke. The healthcare provider needs to understand what is important to the client in terms of short- and long-term goals. Ask the client about the pros and cons of the changes that are needed and then listen carefully for discrepancies that allow for the creation of dissonance. Remember, dissonance is motivating. We develop discrepancies by repeating back the pros and cons as stated by the client. Then, ask the client to discuss his or her goals relative to the treatment. For example, say, “What do you want to happen as a result of taking this medicine for your blood pressure?” Establishing this goal is critical. It not only gives taking medication a specific, definable purpose but also allows us to ask clients about behaviours that do not support the goal.
4. **Roll with resistance** – Ignore antagonistic elements in the client’s comments in order to focus on the important underlying issues. For example, the client says, “Look, I haven’t had any real problems with my smoking so far, so don’t worry about it.” Instead of rejecting this comment by saying, “If you continue smoking, I can assure you that you will suffer some major consequences,” the healthcare provider can roll with the expressed resistance by saying, “I hope your health continues to stay that way. I would like you to consider getting your lungs checked because early stages of cancer and lung disease may not have symptoms. That way, you can make a better decision about whether you want to keep smoking. I am worried that your smoking is going to make your heart disease much worse in the future. However, the decision to smoke or quit smoking is yours.” Do not meet resistance with confrontation but instead utilize reflection to create dissonance. This allows the client to hear information without being chastised. In the end, the decision belongs to the client.
5. **Support self-efficacy** – A person’s belief in the possibility of change (Bandura, 1977; 1982) is an important motivator. Clients, based on their abilities and the resources and strengths they possess, need to be encouraged by the healthcare provider. Questions such as: “What worked before?” or “What do you think helped you to be successful last time?” provide valuable information about the client’s strengths. Examine past successes (or failures) and offer genuine support for the successes. It is important to notice not only actual changes in behaviour, but also contemplated changes, expressed in a positive manner. The client must be able to imagine that success is a possibility before actually trying to change.

When using Motivational Interviewing, there are five general skills that should be utilized.

1. **Asking open-ended questions:** Asking questions in such a way that it is the client who is encouraged to do most of the talking. Some examples: “What concerns you about your health?” or “What is it that you like about smoking” or “What reasons might you have for not quitting smoking?” or “Tell me about the difficulties you encounter when trying to refill your prescriptions.” Miller and Rollnick (1991) recommend not asking more than three questions in a row. Asking open-ended questions sets the stage for reflective listening, affirmations and summation.
2. **Reflective listening:** As a foundational skill in motivational interviewing, reflective listening is useful to address resistance. Reflections can be simple “you’re feeling sad” to more complex, “It sounds like you are concerned what smoking all these years may have done to your overall health.” Reflective statements, whether simple, amplified or double sided, tells the client that you have heard what he or she is saying and encourages them to explore their feelings.

Simple reflection acknowledges the client’s thoughts, feelings and positions in a neutral manner.

Jane: Just because I’m late getting my prescriptions filled, I can’t believe that you are going to count my pills each time that I come. Is this all just because I keep forgetting to bring my bottles with me? Don’t you have more important things to do with your time?

Nurse (simple reflection): You are having a hard time understanding why we need to do this, aren’t you?

Jane: Well yes, I mean, don’t get me wrong, I know that it is important to get my prescriptions filled on time.

The nurse has rolled with resistance and let the client know that her concerns have been heard. The door is open for exploration.

Jane: Just because I’m late getting my prescriptions filled, I can’t believe that you are going to count my pills each time that I come. Is this all just because I keep forgetting to bring my bottles with me? Don’t you have more important things to do with your time?

Nurse (amplified reflection): You are thinking that we do not believe you.

Jane: Well yes, I take my pills each day and just because I didn’t get the prescription filled on time, it is not necessary to go to these lengths. This makes me feel bad. I am not a dummy. I know that it is important to get my prescriptions filled on time.

Jane is not happy and but is recognizing that it is important to get the prescriptions filled. Ambivalence has been created.

Jane: Just because I’m late getting my prescriptions filled, I can’t believe that you are going to count my pills each time that I come. Is this all just because I keep forgetting to bring my bottles with me? Don’t you have more important things to do with your time?

Nurse (double sided reflection): On one hand, you recognize that you must get your prescriptions filled on time, yet on the other hand you have trouble doing so.

Jane: Well yes, I know. I know that I should take my blood pressure medication so that I do not have a stroke or other problems but it is really difficult for me to get to the pharmacy as I don’t drive and at times, I just don’t have enough money to pay for the pills.

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Jane has acknowledged that she has difficulty getting her prescriptions renewed but has looked at the bigger picture, i.e., she does not want to have a stroke.

Resistance is information and reflection is useful to explore where the resistance is coming from and why it is there.

3. **Affirmations:** Support for what the client is saying should occur frequently throughout the conversation. Praising or complimenting and exploring past successes help to build a therapeutic relationship. For example, “With all of the problems that you have been having lately Jane, I really appreciate that you were able to come to the appointment today.”
4. **Summarizing or reframing:** Reframing pulls the information together so that the client can reflect upon it. By reframing, you tell the client that you have been listening and are open to exploring the situation further.

Nurse: Jane, I understand how hard it must be to get to the pharmacy when you do not have a car. It must be difficult trying to get to a bus route when you do not live near one. Also, the fact that we have had such a hard winter must make this even more difficult. You have mentioned to me how proud you are to be 84 years old and still be living independently and I must admit that this is a wonderful quality. It is admirable to be able to do everything for yourself. But, on the other hand, I hear you tell me that you do not want to end up like your mother, robbed of independence because of a stroke. You have told me that this is your greatest fear. I know, from our many conversations, that you understand how important it is to keep your blood pressure under good control. You are concerned and as we talk, I feel as though you are caught in a dilemma.

The summary links together the main points of the interview, both past and present. The ambivalence is clear and the reflection in the end encourages the client to address the ambivalence (whether to continue to struggle to get her prescriptions filled or ask someone to help).

5. **Self-motivational statements:** Clients must be responsible for change and motivated to acknowledge ambivalence when change is being considered and set the stage for dialogue to occur. The client argues the pros and cons of changing the behaviour and the healthcare provider gets insight into the client's feelings and values as he listens to the argument.
6. **Personalized feedback:** This can be done on a one-to-one basis or through the use of standardized tools; for example, a chart showing the change of blood pressure toward the target levels as the client adheres to the goals set at a previous visit. The feedback must not be confrontational to the client. Instead, the data will do the confronting if the client has not been adherent.

Appendix F: Client Education – Home Monitors

Buying and Using Your Home Blood Pressure Monitor

Things to think about when buying your blood pressure monitor:

- The cost of monitors ranges between \$80-140.
- Choose a monitor that meets the standards of the Association for Advancement of Medical Instrumentation (AAMI), the British Hypertension Society (BHS) or International Protocol (IP). It will have this trademark symbol* on the package if it meets these standards:



*Endorsed by the Canadian Coalition for the Prevention and Control of Hypertension

- Cuffs come in different sizes. Choose the right cuff size for you – the cuff should cover 80% of your upper arm.
- Some monitors automatically record and store your blood pressure readings – this may help you to share the results with your healthcare provider.
- If you're not sure which monitor to buy, ask your healthcare provider for help.

Taking your blood pressure at home:

Preparing to take your blood pressure:

- Read the instructions that come with your monitor carefully.
- Don't drink coffee (or any other caffeinated beverage) for one hour before taking your blood pressure.
- Do not smoke 15-30 minutes before taking your blood pressure.
- Rest for 5 minutes before taking your blood pressure.

When taking your blood pressure:

- Sit up straight with your back supported. Support your arm so that your elbow is just below the level of your heart.
- Never cross your legs when taking your blood pressure.
- Don't talk while taking your blood pressure.
- Check your blood pressure twice in the morning (before taking medications) and twice in the evening for seven consecutive days.

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Keeping a record of your blood pressure readings:

- Keep a record (diary) of your blood pressure readings (date, time and results).
- Take your blood pressure monitor and record with you to your next appointment with your healthcare provider. Show your doctor or nurse how you take your blood pressure using the monitor.
- Discuss with your healthcare provider how often and when you should be checking your blood pressure.

Checking your monitor:

- Your home monitor should be checked once a year at the clinic or doctor's office to make sure it is working properly. Have your blood pressure checked using both your home monitor and the clinic equipment. Your healthcare provider will compare the readings – they should be the same.

Adapted from: Heart and Stroke Foundation of Ontario (2005). *A guide for selecting and using home blood pressure monitors*. Toronto: Heart and Stroke Foundation of Ontario.



Appendix G: Hypertensive Urgencies and Emergencies

When clients demonstrate features of a hypertensive emergency/urgency, they should be diagnosed as hypertensive at their first visit, as they require immediate management.

The following is a summary from CHEP (2004) of the way hypertensive urgencies and emergencies may present:

- Asymptomatic diastolic blood pressure >130 mmHg **or** systolic blood pressure >200 mmHg
- Accelerated malignant hypertension with papilloedema
- Following severe body burns
- Severe epistaxis

Cerebrovascular:

- Hypertensive encephalopathy
- Atheroembolic brain infarction with severe hypertension
- Intracerebral hemorrhage
- Subarachnoid hemorrhage

Cardiac:

- Acute aortic dissection
- Acute refractory left ventricular failure
- Acute myocardial ischemia or infarction with persistent ischemic pain
- After coronary bypass surgery

Renal:

- Acute glomerulonephritis
- Renal crises from collagen vascular diseases
- Severe hypertension following renal transplantation

Excessive circulating catecholamines:

- Pheochromocytoma
- Tyramine containing foods or drug interactions with monoamine-oxidase inhibitors
- Sympathomimetic drug use (e.g., cocaine use)
- Rebound hypertension after cessation of antihypertensive drugs (e.g., clonidine or guanabenz)

Toxemia of pregnancy:

- Eclampsia

Surgical:

- Severe hypertension in clients requiring emergency surgery
- Severe post-operative hypertension
- Post-operative bleeding from vascular suture lines

Reference:

Hemmelgarn, B.R. et al. (2004). The 2004 Canadian Hypertension Education Program Recommendations for the management of Hypertension: Part I – Blood pressure management, diagnosis and assessment of risk. *Canadian Journal of Cardiology*, 20(1), 31-40.

Appendix H: Dietary Approaches to Stop Hypertension (DASH) Diet

The following information about the DASH eating plan is provided as a resource for client education. The complete document can be found at:

US Department of Health and Human Services

National Institutes of Health – National Heart, Lung and Blood Institute

Facts about the DASH Eating Plan http://www.nhlbi.nih.gov/health/public/heart/hbp/dash/new_dash.pdf

The DASH eating plan was not designed to promote weight loss. However, it is rich in lower calorie foods, such as fruits and vegetables. You can make it lower in calories by replacing higher calorie foods with more fruits and vegetables – and that also will make it easier for you to reach your DASH goals. Here are some examples:

To increase fruits:

- Eat a medium apple instead of four shortbread cookies. *You'll save 80 calories.*
- Eat ¼ cup of dried apricots instead of a 2-ounce bag of pork rinds. *You'll save 230 calories.*

To increase vegetables:

- Have a hamburger that contains 3 ounces of meat instead of 6 ounces. Add ½ cup serving of carrots and ½ cup serving of spinach. *You'll save more than 200 calories.*
- Instead of 5 ounces of chicken, have a stir-fry with 2 ounces of chicken and 1½ cups of raw vegetables. Use a small amount of vegetable oil. *You'll save 50 calories.*

To increase lowfat or fat free dairy products:

- Have a ½ cup serving of lowfat frozen yogurt instead of a 1½-ounce milk chocolate bar. *You'll save about 110 calories.*

Calorie-saving tips:

- Use lowfat or fat free condiments.
- Use half as much vegetable oil, soft or liquid margarine, or salad dressing, or choose fat free versions.
- Eat smaller portions – cut back gradually.
- Choose lowfat or fat free dairy products to reduce total fat intake.
- Check the food labels to compare fat content in packaged foods – items marked lowfat or fat free are not always lower in calories than their regular versions.
- Limit foods with lots of added sugar, such as pies, flavoured yogurts, candy bars, ice cream, sherbet, regular soft drinks and fruit drinks.
- Eat fruits canned in their own juice.
- Add fruit to plain yogurt.
- Snack on fruit, vegetable sticks, unbuttered and unsalted popcorn or bread sticks.
- Drink water or club soda. **Note:** Club soda contains sodium, and those on a salt restricted diet should limit their consumption of club soda.

The DASH eating plan below is based on 2,000 calories a day. The number of daily servings in a food group may vary from those listed, depending on calorie needs (see chart below). Use this chart to help plan menus or take it with you when you go to the store.

Food Group	Daily Servings (except as noted)	Serving Sizes	Examples and notes	Significance of each food group to the DASH eating plan
Grains and grain products	7-8	1 slice bread 1 oz dry cereal* ½ cup cooked rice, pasta or cereal	Whole wheat bread, english muffin, pita bread, bagel, cereals, grits, oatmeal, crackers, unsalted pretzels, popcorn	Major sources of energy and fibre
Vegetables	4-5	1 cup raw leafy vegetable ½ cup cooked vegetable 6 oz vegetable juice	Tomatoes, potatoes, carrots, green peas, squash, broccoli, turnip greens, collards, kale, spinach, artichokes, green beans, lima beans, sweet potatoes	Rich sources of potassium, magnesium, and fibre
Fruits	4-5	6 oz fruit juice 1 medium fruit ¼ cup dried fruit ½ cup fresh, frozen or canned fruit	Apricots, bananas, dates, grapes, oranges, orange juice, grapefruit, grapefruit juice, mangoes, melons, peaches, pineapples, prunes, raisins, strawberries, tangerines	Important sources of potassium, magnesium and fibre
Lowfat or fat free dairy foods	2-3	8 oz milk 1 cup yogurt 1½ oz cheese	Fat free (skim) or lowfat (1%) milk, fat free or lowfat buttermilk, fat free or lowfat regular or frozen yogurt, lowfat and fat free cheese	Major sources of calcium and potassium
Meats, poultry, and fish	2 or less	3 oz cooked meat, poultry or fish	Select only lean; trim away visible fats; broil, roast or boil, instead of frying; remove skin from poultry	Rich sources of protein and magnesium
Nuts, seeds, and dry beans	4-5 per week	⅓ cup or 1½ oz nuts 2 tbsp or ½ oz seeds ½ cup cooked dry beans/peas	Almonds, filberts, mixed nuts, peanuts, walnuts, sunflower seeds, kidney beans, lentils	Rich sources of energy, magnesium, potassium, protein and fibre
Fats and oils**	2-3	1 tsp soft margarine 1 tbsp lowfat mayonnaise 2 tbsp light salad dressing 1 tsp vegetable oil	Soft margarine, lowfat mayonnaise, light salad dressing, vegetable oil (olive, corn, canola or safflower)	DASH has 27 percent of calories as fat, including fat in or added to foods
Sweets	5 per week	1 tbsp sugar 1 tbsp jelly or jam ½ oz jelly beans 8 oz lemonade	Maple syrup, sugar, jelly, jam, fruit-flavoured gelatin, jelly beans, hard candy, fruit punch, sorbet, ices	Sweets should be low in fat

* Equals ½ – 1¼ cups, depending on cereal type. Check the product's Nutrition Facts label.

** Fat content changes serving counts for fats and oils. For example, 1 tbsp of regular salad dressing equals 1 serving; 1 tbsp of a lowfat dressing equals ½ serving; 1 tbsp of a fat free dressing equals 0 servings.

DASH Eating Plan – Number of Servings for Calorie Levels		
Food Group	Servings/Day	
	1600 Calories/Day	3100 Calories/Day
Grains and grain products	6	12-13
Vegetables	3-4	6
Fruits	4	6
Lowfat or fat free dairy foods	2-3	3-4
Meat, poultry and fish	1-2	2-3
Nuts, seeds and dry beans	3/week	1
Fats and oils	2	4
Sweets	0	2

GET STARTED! – Change gradually.

- If you now eat one or two vegetables a day, add a serving at lunch and another at dinner.
- If you don't eat fruit now or have only juice at breakfast, add a serving to your meals or have it as a snack.
- Gradually increase your use of fat free and lowfat dairy products to three servings a day. For example, drink milk with lunch or dinner, instead of soda, sugar-sweetened tea or alcohol. Choose lowfat (1 percent) or fat free (skim) dairy products to reduce your intake of saturated fat, total fat, cholesterol and calories.
- Read food labels on margarines and salad dressings to choose those lowest in saturated fat and trans fat. Some margarines are now trans-fat free.
- You should be aware that the DASH eating plan has more daily servings of fruits, vegetables and whole grain foods than you may be used to eating. Because the plan is high in fibre, it can cause bloating and diarrhea in some persons. To avoid these problems, gradually increase your intake of fruit, vegetables and whole grain foods.

Treat meat as one part of the whole meal, instead of the focus.

- Limit meat to 6 ounces a day (2 servings) – all that's needed. Three to four ounces is about the size of a deck of cards.
- If you now eat large portions of meat, cut them back gradually – by a half or a third at each meal.
- Include two or more vegetarian-style (meatless) meals each week.
- Increase servings of vegetables, rice, pasta and dry beans in meals. Try casseroles and pasta, and stir-fry dishes, which have less meat and more vegetables, grains and dry beans.

Use fruits or other foods low in saturated fat, cholesterol and calories as desserts and snacks.

- Fruits and other lowfat foods offer great taste and variety. Use fruits canned in their own juice. Fresh fruits require little or no preparation. Dried fruits are a good choice to carry with you or to have ready in the car.
- Try these snack ideas: unsalted pretzels or nuts mixed with raisins; graham crackers; lowfat and fat free yogurt and frozen yogurt; popcorn with no salt or butter added; and raw vegetables.

Try these other tips:

- Choose whole grain foods to get added nutrients, such as minerals and fibre. For example, choose whole wheat bread or whole grain cereals.
- If you have trouble digesting dairy products, try taking lactase enzyme pills or drops (available at drugstores and groceries) with the dairy foods. Or, buy lactose-free milk or milk with lactase enzyme added to it.
- Use fresh, frozen, or no-salt-added canned vegetables.

A sample day following the DASH eating plan:

DAY 1

Abbreviations: oz = ounce, tsp = teaspoon, Tbsp = tablespoon, g = gram, mg = milligram

2,400 mg Sodium Menu	Sodium (mg)	Substitutions To Reduce Sodium to 1,500 mg	Sodium (mg)	Number of DASH Food Group Servings						
				Grains	Vegetables	Fruits	Dairy	Meat, poultry, and fish	Nuts, seeds, and dry beans	Fats and oils
Breakfast										
$\frac{2}{3}$ cup bran cereal	161	$\frac{2}{3}$ cup shredded wheat cereal	3	1						
1 slice whole wheat bread	149			1						
1 medium banana	1					1				
1 cup fruit yogurt, fat free, no sugar added	53						1			
1 cup fat free milk	126						1			
2 tsp jelly	5									$\frac{2}{3}$
Lunch										
$\frac{3}{4}$ cup chicken salad*	201	remove salt from recipe	127					1		1
2 slices whole wheat bread	299			2						
1 Tbsp Dijon mustard	372	1 Tbsp regular mustard	196							
salad:										
$\frac{1}{2}$ cup fresh cucumber slices	8				1					
$\frac{1}{2}$ cup tomato wedges	1				1					
2 Tbsp ranch dressing, fat free	306	2 Tbsp yogurt salad dressing	84							
$\frac{1}{2}$ cup fruit cocktail, juice pack	5					1				
Dinner										
3 oz beef, eye of round	52							1		
2 Tbsp beef gravy, lowfat	163	2 Tbsp beef gravy, lowfat, unsalted	5							
1 cup green beans, cooked from frozen	12				2					
1 small baked potato:	7				1					
2 Tbsp sour cream, fat free	28									
2 Tbsp grated cheddar cheese, natural, reduced fat	86	2 Tbsp cheddar cheese, natural, reduced fat, low sodium	1				$\frac{1}{4}$			
1 Tbsp chopped scallions	1									
1 small whole wheat roll	148			1						
1 tsp soft margarine	51	1 tsp soft margarine, unsalted	1							1
1 small apple	0					1				
1 cup fat free milk	126						1			
Snack										
$\frac{1}{3}$ cup almonds, unsalted	5								1	
$\frac{1}{4}$ cup raisins	2					1				
1 cup orange juice	2					$\frac{1}{3}$				
Totals				5	5	$5\frac{1}{3}$	$3\frac{1}{4}$	2	1	2 $\frac{2}{3}$

	SODIUM LEVEL	
Nutrients Per Day	2,400 mg	1,500 mg
Calories	2,024	1,998
Total fat	51 g	50 g
Percent calories from fat	23%	23%
Saturated fat	9 g	9 g
Percent calories from saturated fat	4%	4%
Cholesterol	164 mg	164 mg

	SODIUM LEVEL	
Nutrients Per Day	2,400 mg	1,500 mg
Sodium	2,363 mg	1,320 mg
Calcium	1,257 mg	1,338 mg
Magnesium	572 mg	589 mg
Potassium	4,780 mg	4,745 mg
Fiber	34 g	34 g

Appendix I: Reducing Sodium and DASH

US Department of Health and Human Services

National Institutes of Health – National Heart, Lung and Blood Institute

Facts about the DASH Eating Plan http://www.nhlbi.nih.gov/health/public/heart/hbp/dash/new_dash.pdf

Where is the sodium?

Only a small amount of sodium occurs naturally in foods. Most sodium is added during processing. The following table gives examples of the varying amounts of sodium in some foods.

Food Groups	Sodium (mg)
Grains and grain products	
■ Cooked cereal, rice, pasta, unsalted, ½ cup	0–5
■ Ready-to-eat cereal, 1 cup	100–360
■ Bread, 1 slice	110–175
Vegetables	
■ Fresh or frozen, cooked without salt, ½ cup	1–70
■ Canned or frozen with sauce, ½ cup	140–460
■ Tomato juice, canned ¾ cup	820
Fruit	
■ Fresh, frozen, canned, ½ cup	0–5
Lowfat or fat free dairy foods	
■ Milk, 1 cup	120
■ Yogurt, 8 oz	160
■ Natural cheeses, 1½ oz	110–450
■ Processed cheeses, 1½ oz	600
Nuts, seeds, and dry beans	
■ Peanuts, salted, ½ cup	120
■ Peanuts, unsalted, ½ cup	0–5
■ Beans, cooked from dried, or frozen, without salt, ½ cup	0–5
■ Beans, canned, ½ cup	400
Meats, fish, and poultry	
■ Fresh meat, fish, poultry, 3 oz	30–90
■ Tuna canned, water pack, no salt added, 3 oz	35–45
■ Tuna canned, water pack, 3 oz	250–350
■ Ham, lean, roasted, 3 oz	1,020

Twenty-four hundred milligrams of sodium equals about 6 grams, or 1 teaspoon, of table salt (sodium chloride); 1,500 milligrams of sodium equals about 4 grams, or $\frac{2}{3}$ teaspoon, of table salt. These amounts include all salt consumed – that in food products, used in cooking, and added at the table. Only small amounts of sodium occur naturally in food. *Processed foods account for most of the salt and sodium consumed.* So, be sure to read food labels to choose products lower in sodium. You may be surprised at many of the foods that have sodium. They include soy sauce, seasoned salts, monosodium glutamate (MSG), baking soda and some antacids – the range is wide. Because it is rich in fruits and vegetables, which are naturally lower in sodium than many other foods, the DASH eating plan makes it easier to consume less salt and sodium. Begin by adopting the DASH eating plan at the level of 2,400 milligrams of sodium per day and then further lower your sodium intake to 1,500 milligrams per day.

Tips to reduce sodium (Salt):

- Use reduced sodium or no-salt-added products. For example, choose low- or reduced-sodium, or no-salt-added versions of foods and condiments when available.
- Buy fresh, plain frozen, or canned with “no-salt-added” vegetables.
- Use fresh poultry, fish, and lean meat, rather than canned, smoked, or processed types.
- Choose ready-to-eat breakfast cereals that are lower in sodium.
- Limit cured foods (such as bacon and ham), foods packed in brine (such as pickles, pickled vegetables, olives, and sauerkraut), and condiments (such as MSG, mustard, horseradish, ketchup, and barbecue sauce). Limit even lower sodium versions of soy sauce and teriyaki sauce – treat these condiments as you do table salt.
- Use spices instead of salt. In cooking and at the table, flavour foods with herbs, spices, lemon, lime, vinegar, or salt-free seasoning blends. Start by cutting salt in half.
- Cook rice, pasta, and hot cereals without salt. Cut back on instant or flavoured rice, pasta, and cereal mixes, which usually have added salt.
- Choose “convenience” foods that are lower in sodium. Cut back on frozen dinners, mixed dishes such as pizza, packaged mixes, canned soups or broths, and salad dressings – these often have a lot of sodium.
- Rinse canned foods, such as tuna, to remove some sodium.

Reducing sodium when eating out:

- Ask how foods are prepared. Ask that they be prepared without added salt, MSG, or salt-containing ingredients. Most restaurants are willing to accommodate requests.
- Know the terms that indicate high sodium content: pickled, cured, soy sauce, broth.
- Move the salt shaker away.
- Limit condiments, such as mustard, ketchup, pickles and sauces with salt-containing ingredients.
- Choose fruits or vegetables instead of salty snack foods.

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Compare Food Labels:

- Read the Nutrition Facts on food labels to compare the amount of sodium in products. Look for the sodium content in milligrams and the Percent Daily Value. Aim for foods that are less than 5 percent of the Daily Value of sodium.
- Compare the food labels of these two versions of canned tomatoes. The regular canned tomatoes (right) have 10 times as much sodium as the unsalted canned tomatoes.

CANNED DICED TOMATOES, NO SALT ADDED	CANNED DICED TOMATOES
Nutrition Facts Serving Size 1/2 cup Servings Per Container approx. 3 1/2 <hr/> Amount Per Serving Calories 25 Calories from Fat 0 <hr/> Total Fat 0 g 0% Saturated Fat 0 g 0% Cholesterol 0 mg 0% Sodium 20 mg 1% Total Carbohydrate 6 g 2% Dietary Fiber 2 g 8% Sugars 4 g Protein 1 g <hr/> Vitamin A 10% • Vitamin C 15% Calcium 2% • Iron 2% <small>*Percent Daily Values are based on a 2,000 calorie diet</small>	Nutrition Facts Serving Size 1/2 cup Servings Per Container approx. 3 1/2 <hr/> Amount Per Serving Calories 25 Calories from Fat 0 <hr/> Total Fat 0 g 0% Saturated Fat 0 g 0% Cholesterol 0 mg 0% Sodium 200 mg 8% Total Carbohydrate 6 g 2% Dietary Fiber 2 g 8% Sugars 4 g Protein 1 g <hr/> Vitamin A 10% • Vitamin C 15% Calcium 2% • Iron 2% <small>*Percent Daily Values are based on a 2,000 calorie diet</small>

How to read food labels:

Food labels can help you choose items lower in sodium and saturated and total fat. Look for the following labels on cans, boxes, bottles, bags and other packaging:

Phrase	What it means
SODIUM	
Sodium free or salt free	Less than 5 mg per serving
Very low sodium	35 mg or less of sodium per serving
Low sodium	140 mg or less of sodium per serving
Low sodium meal	140 mg or less of sodium per 3 1/2 oz (100 g)
Reduced or less sodium	At least 25 percent less sodium than the regular version
Light in sodium	50 percent less sodium than the regular version
Unsalted or no added salt	No salt added to the product during processing
FAT	
Fat free	Less than 0.5 mg per serving
Low saturated fat	1 g or less per serving
Lowfat	3 g or less per serving
Reduced fat	At least 25 percent less fat than the regular version
Light in fat	Half the fat compared to the regular version

Remember that some days the foods you eat may add up to more than the recommended servings from one food group and less from another. Similarly, you may have too much sodium on a particular day. Don't worry. Just be sure that the average of several days or a week comes close to what's recommended for the food groups and for your chosen daily sodium level. One important note: If you take medication to control high blood pressure, you should not stop using it. Follow the DASH eating plan, and talk with your health care provider about your drug treatment.

Appendix J: Recording Food Habits and DASH

The following food diary is provided as example of a tool that can be used to help clients track their food habits before or after they start on the DASH eating plan.

US Department of Health and Human Services

National Institutes of Health – National Heart, Lung and Blood Institute

Facts about the DASH Eating Plan http://www.nhlbi.nih.gov/health/public/heart/hbp/dash/new_dash.pdf

WHAT'S ON YOUR PLATE?										
Use this form to track your food habits before you start on the DASH eating plan or to see how you're doing after a few weeks. To record more than 1 day, just copy the form. Total each day's food groups and compare what you ate with the DASH eating plan.										
Food	Amount (serving size)	Sodium (mg)	Number of Servings by DASH Food Group							
			Grains	Vegetables	Fruits	Dairy	Meat, poultry, and fish	Nuts, seeds, and dry beans	Fats and oils	Sweets
Breakfast										
Example: whole wheat bread and soft margarine	2 slices 2 tsp	299 102	2							2
Lunch										
Dinner										
Snacks										
Day's Total										
Compare yours with the DASH eating plan		2,400 mg or 1,500 mg	7-8 daily	4-5 daily	4-5 daily	2-3 daily	2 or less	4-5 a week	2-3 daily	5 a week

Appendix K: Canadian Body Weight Classification System

Canadian Guidelines for Body Weight Classification in Adults. Health Canada – Office of Nutrition Policy and Promotion (2005). Retrieved [Electronic Version] from: http://www.hc-sc.gc.ca/hpfb-dgpsa/onpp-bppn/qa_public_e.html#2
Reproduced with the permission of the Minister of Public Works and Government Services Canada, 2005.

What is the Canadian body weight classification system?

The Canadian body weight classification system uses the body mass index (BMI) and the waist circumference to assess the risk of developing health problems associated with overweight or underweight.

The system is for use with adults age 18 years and over, with the exception of pregnant and lactating women.

What is the body mass index (BMI)?

The BMI is a ratio of weight-to-height. Research studies in large groups of people have shown that the BMI can be classified into ranges associated with health risk. There are four categories of BMI ranges in the Canadian weight classification system. These are:

- underweight (BMI less than 18.5);
- normal weight (BMI 18.5 to 24.9);
- overweight (BMI 25 to 29.9), and
- obese (BMI 30 and over).

Calculating BMI:

You can calculate BMI using several methods:

1. Mathematical Formula:

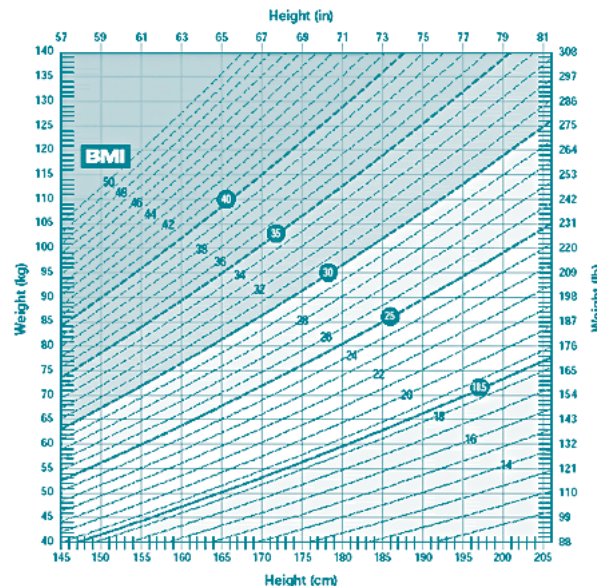
$$\text{BMI} = \frac{\text{weight in kilograms}}{(\text{height in metres})^2}$$

2. An online “calculator” to determine BMI is available at:

http://www.hc-sc.gc.ca/hpfb-dgpsa/onpp-bppn/bmi_chart_java_e.html

3. BMI Charts/Tables can be used to calculate/determine BMI.

To estimate BMI, locate the point on the chart where height and weight intersect. Read the number on the dashed line closest to this point. For example, if you weigh 69 kg and are 173 cm tall, you have a BMI of approximately 23, which is in the normal weight range.



Canadian Guidelines for Body Weight Classification in Adults. Health Canada (2003). Reproduced with the permission of the Minister of Public Works and Government Services Canada, 2005.

What is the waist circumference?

Waist circumference provides an indicator of abdominal fat. Excess fat around the waist and upper body (also described as an ‘apple’ body shape) is associated with greater health risk than fat located more in the hip and thigh area (described as a ‘pear’ body shape).

A waist circumference at or above 102 cm (40 in.) for men, and 88 cm (35 in.) for women, is associated with an increased risk of developing health problems such as diabetes, heart disease and high blood pressure. The cut-off points are approximate, so a waist circumference just below these values should also be taken seriously.

In general, the risk of developing health problems increases as waist circumference increases above the cut-off points listed above. Even if the BMI of an individual is in the ‘normal weight’ range, a high waist circumference indicates some health risk.

To determine waist circumference, the individual taking the measurement should stand beside the individual. Waist circumference is measured at the part of the torso located midway between the lowest rib and the iliac crest (top of the pelvic bone). The tape should fit without compressing any underlying soft tissues.

Additional details regarding waist circumference can be found at Health Canada:

http://www.hc-sc.gc.ca/hpfb-dgpsa/onpp-bppn/cg_quick_reference_e.html

Appendix L: Assessing Alcohol Consumption

Reproduced with permission.

Ewing, J. (1984). Detecting alcoholism: The CAGE questionnaire. *Journal of the American Medical Association*, 252(14), 1905-1907.

CAGE Questionnaire

- Have you ever felt you ought to Cut down on your drinking?
- Have people Annoyed you by criticizing your drinking?
- Have you ever felt bad or Guilty about your drinking?
- Have you ever had a drink first thing in the morning to steady your nerves or get rid of a hangover (Eye-opener)?

Scoring: One point for each positive answer

Score of 1-3 should create a high index of suspicion and warrants further evaluation.

Score = 1 80% are alcohol dependent

Score = 2 89% are alcohol dependent

Score = 3 99% are alcohol dependent

Score = 4 100% are alcohol dependent

Alcohol Use Disorders Identification Test (AUDIT)

Early detection & counseling of problem drinking. *The Canadian Guide to Clinical Preventative Health Care*. Chap 42, (488-498).

Health Canada (1994). Reproduced with the permission of the Minister of Public Works and Government Services Canada, 2005.

1. How often do you have a drink containing alcohol?

- Never (0)
- Monthly or less (1)
- Two to four times a month (2)
- Two to three times a week (3)
- Four or more times a week (4)

2. How many drinks containing alcohol do you have on a typical day when you are drinking?

- 1 or 2 (0)
- 3 or 4 (1)
- 5 or 6 (2)
- 7 to 9 (3)
- 10 or more (4)

3. How often do you have six or more drinks on one occasion?

- Never (0)
- Monthly or less (1)
- Two to four times a month (2)
- Two to three times a week (3)
- Four or more times a week (4)

4. How often during the last year have you found that you were not able to stop drinking once you started?

- Never (0)
- Less than monthly (1)
- Monthly (2)
- Weekly (3)
- Daily or almost daily (4)

5. How often during the last year have you failed to do what was normally expected from you because of drinking?
- Never (0)
Less than monthly (1)
Monthly (2)
Weekly (3)
Daily or almost daily (4)
6. How often during the last year have you needed a first drink in the morning to get yourself going after a heavy drinking session?
- Never (0)
Less than monthly (1)
Monthly (2)
Weekly (3)
Daily or almost daily (4)
7. How often during the last year have you had a feeling of guilt or remorse after drinking?
- Never (0)
Less than monthly (1)
Monthly (2)
Weekly (3)
Daily or almost daily (4)
8. How often during the last year have you been unable to remember what happened the night before because you had been drinking?
- Never (0)
Less than monthly (1)
Monthly (2)
Weekly (3)
Daily or almost daily (4)
9. Have you or someone else been injured as a result of your drinking?
- No (0)
Yes, but not in the last year (2)
Yes, during the last year (4)
10. Has a relative or friend, or a doctor, or another health worker been concerned about your drinking, or suggested you cut down?
- No (0)
Yes, but not in the last year (2)
Yes, during the last year (4)

Scoring: The number for each response is the number of points. Answers for each question range from 0 to 4. There is no set cut-off point indicating harmful use. A score of 2 or more indicates some level of harmful use. The particular score that warrants a further evaluation depends in part on the situation, e.g., a score of 3 for someone who is scheduled for surgery would clearly warrant further evaluation, although this might not be as critical for the healthy individual who is seen during a routine physical exam. However, client education/harm reduction efforts are indicated for anyone who scores over a 1.



Additional tools for screening for alcohol use/abuse:

Michigan Alcoholism Screening Test (MAST)

Selzer, M. (1971). The Michigan Alcoholism Screening Test: The quest for a new diagnostic instrument. *American Journal of Psychiatry*, 127(12), 1653-1658.

Short MAST (S-MAST)

Selzer, M., Vinokur, A. & VanRooijen, L. (1975). A self-administered Short Michigan Alcohol Screening Test (S-MAST). *Journal of Studies on Alcohol*, 36(1), 117-126.

Brief MAST

MacKenzie, D., Langa, A. & Brown, T. (1996). Identifying hazardous or harmful alcohol use in medical admissions: A comparison of AUDIT, CAGE and brief MAST. *Alcohol and Alcoholism*, 31(6), 591-599.

TWEAK

Chan, A., Pristach, E., Welte, J. & Russell, M. (1993). Use of the TWEAK test in screening for alcoholism/heavy drinking in three populations. *Alcoholism: Clinical and Experimental Research*, 17(6), 1188-1192.

T-ACE

Sokol, R., Martier, S., & Ager, J. (1989). The T-ACE questions: Practical prenatal detection of risk-drinking. *American Journal of Obstetrics and Gynecology*, 160(4), 863-870.

Fast Alcohol Screening Test (FAST)

Health Development Agency (NHS) (2002). Manual for the Fast Alcohol Screening Test (FAST). Fast screening for alcohol problems. Health Development Agency and University of Wales College of Medicine. Retrieved [Electronic Version] from: www.hda-online.org.uk



Appendix M: Smoking Cessation – Brief Intervention

Reproduced with permission

© 2005 State of Arizona, Arizona Department of Health Services, Arizona Tobacco Education and Prevention Program.

Step 1: ASK at every encounter,

- “Do you use tobacco?”
- “Have you ever used tobacco?”
- “Are you exposed to second hand smoke?”

Tips:

- Have a system. Make asking routine and simple.
- Let the person know that you ask because you care and because asking is part of your job.
- It is recommended that asking about tobacco use is included as a vital sign.
- Documentation of tobacco use and intervention should be noted in the client’s medical chart (PHS, 2005).

Step 2: ADVISE all tobacco users to quit.

Tips:

- Relevance: Make advice fit the person.
- Rewards: How will the tobacco user benefit from quitting?
- Risks: What risks are real and current for this tobacco user?
- Roadblocks: What does the tobacco user identify as problems in quitting?
What barriers may affect the client’s readiness to quit?
- Repeat advice at each encounter. Repetition promotes effective outcomes.

Step 3: ASSESS tobacco user’s willingness to make a quit attempt

Tips:

- Ask: “Are you willing to set a quit date within 30 days?”

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*If the tobacco user is **unwilling to talk** about quitting, or is **not ready to set a quit date** within 30 days:

Step 4: **ASSIST** the tobacco user to think about quitting in the future.

Tips:

- Tobacco users who are not ready to quit today may be ready the next time you see them.
- Do not pressure the tobacco user into quitting.
- Offer self-help materials or literature that stimulates thinking about quitting tobacco.

Step 5: **ARRANGE** for follow-up

Tips:

- Let the tobacco user know that you are available when he or she is ready to quit.
- Inform the tobacco user that because it is so important, you will continue to ask about tobacco use.

*If the tobacco user is **ready to set a quit date** within 30 days:

Step 4: **ASSIST** the tobacco user by starting a simple Quit Plan

Tips:

- Use the Quit Plan to guide the intervention.
- Keep it simple. Avoid counseling or problem solving.
- Make use of referrals to community resources to support the tobacco user's need for counseling.

Step 5: **ARRANGE** for follow-up

Tips:

- Use a reminder system to prompt follow-up contacts.
- Whenever possible, arrange a follow-up call or visit within a week after the tobacco user's quit date.
- Congratulate tobacco users who stay tobacco free and support those who relapse.
Any time spent quit deserves congratulations. Keep a positive attitude.

Appendix N: How Vulnerable are You to Stress?

Used by permission of the authors.

Susceptibility Scale from the Personal Stress Navigator™ by Lyle H. Miller, Ph.D. and Alma Dell Smith, Ph.D.

© 2000, Stress Directions, Inc., www.stressdirections.com

Most people can't avoid stress in our society. However, one can learn to behave in ways that lessen the effects of stress. Researchers have identified a number of factors that affect one's vulnerability to stress – among them are eating and sleeping habits, caffeine and alcohol intake, and how individuals express their emotions. The following self-administered questionnaire is designed to help individuals discover their vulnerability quotient and to pinpoint trouble spots.

Scoring: Rate each item from 1 (always) to 5 (never), according to how much of the time the statement is true. Be sure to mark each item, even if it does not apply – for example, if you don't smoke, circle 1 next to item six.

The following test was developed by psychologists Lyle H. Miller, Ph.D. and Alma Dell Smith, Ph.D.

	Always		Sometimes		Never
1. I eat at least one hot, balanced meal a day.	1	2	3	4	5
2. I get seven to eight hours of sleep at least four nights a week.	1	2	3	4	5
3. I give and receive affection regularly.	1	2	3	4	5
4. I have at least one relative within 50 miles on whom I can rely.	1	2	3	4	5
5. I exercise to the point of perspiration at least twice a week.	1	2	3	4	5
6. I limit myself to less than half a pack of cigarettes a day.	1	2	3	4	5
7. I take fewer than five alcohol drinks a week.	1	2	3	4	5
8. I am the appropriate weight for my height.	1	2	3	4	5
9. I have an income adequate to meet basic expenses.	1	2	3	4	5
10. I get strength from my religious beliefs.	1	2	3	4	5
11. I regularly attend club or social activities.	1	2	3	4	5

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	Always		Sometimes		Never
12. I have a network of friends and acquaintances.	1	2	3	4	5
13. I have one or more friends to confide in about personal matters.	1	2	3	4	5
14. I am in good health (including eyesight, hearing, teeth).	1	2	3	4	5
15. I am able to speak openly about my feelings when angry or worried.	1	2	3	4	5
16. I have regular conversations with the people I live with about domestic problems – for example, chores and money.	1	2	3	4	5
17. I do something for fun at least once a week.	1	2	3	4	5
18. I am able to organize my time effectively.	1	2	3	4	5
19. I drink fewer than three cups of coffee (or other caffeine-rich drinks) a day.	1	2	3	4	5
20. I take some quiet time for myself during the day.	1	2	3	4	5
21. I have an optimistic outlook on life.	1	2	3	4	5

To calculate your score, add up your score and subtract 20. A score below 10 indicates excellent resistance to stress. A score over 30 indicates some vulnerability to stress; you are seriously vulnerable if your score is over 50. You can make yourself less vulnerable by reviewing the items on which you scored three or higher and trying to modify them. Notice that nearly all of them describe situations and behaviours over which you have a great deal of control. Concentrate first on those that are easiest to change – for example, eating a hot, balanced meal daily and having fun at least once a week – before tackling those that seem difficult.

Appendix Q provides additional information about resources available to help individuals identify and manage their stress.



Appendix O: Summary of Medication Classes Prescribed for Hypertension

CLASS	ACTIONS	INDICATIONS	CONTRAINDICATIONS/CAUTIONS	SIDE EFFECTS
Thiazide Diuretics e.g., ■ Hydrochlorothiazide ■ Indapamide	Inhibit reabsorption of sodium and chloride in the distal renal tubule. Increase the excretion of sodium, chloride and water by the kidney.	Hypertension without compelling indications for specific agents. Most commonly recommended as first line. Monitor bloodwork (Na⁺, K⁺, creatinine) q6-12 months. Hypokalemia can be avoided by using potassium sparing diuretics (e.g., Hydrochlorothiazide with Amiloride, Triamterene, Spironolactone) or with potassium supplementation.	Hypersensitivity, fluid or electrolyte imbalances, renal or hepatic impairment, gout, glucose tolerance abnormalities, predisposition to serious arrhythmias.	Hypokalemia (<3.5mmol/L), hyponatremia (<120mmol/L), dizziness, vertigo, orthostatic hypotension, nausea, headache, polyuria, nocturia, gout, erectile dysfunction, hyperglycemia. Hyperkalemia with potassium sparing diuretics.
Beta-Blockers e.g., ■ Acebutolol ■ Atenolol ■ Bisoprolol ■ Labetolol ■ Metoprolol ■ Nadolol ■ Pindolol ■ Propranolol ■ Timolol	Competitively block Beta-Adrenergic receptors in the heart and juxtaglomerular apparatus. Decrease the influence of the sympathetic nervous system on these tissues, the release of renin and lower blood pressure.	Hypertension without compelling indications for specific agents. First line in clients under 60 years of age, post myocardial infarction (MI), in clients with systolic dysfunction and stable angina.	Hypersensitivity, asthma or reversible airway obstruction, sinus bradycardia, heart block in absence of pacemaker, peripheral vascular disease, congestive heart failure (CHF). May mask warning signs of hypoglycemia. Not recommended as initial monotherapy for clients over 60 years of age.	Gastrointestinal symptoms, dyspnea, bradycardia, fatigue, nausea, dizziness, erectile dysfunction.
Long-acting Calcium Channel Blockers (CCB's) e.g., <i>Dihydropyridine (DHP)</i> ■ Amlodipine ■ Felodipine (Extended Release) ■ Nifedipine (Extended Release) <i>Non DHP</i> ■ Diltiazem ■ Verapamil	Inhibit the movement of calcium ions across the membranes into cardiac and arterial muscle cells, resulting in vasodilation.	Hypertension without compelling indications for specific agents. Usually as combination therapy.	Hypersensitivity, heart block, ventricular dysfunction, bradycardia, pregnancy. Non-DHP CCB's (Verapamil, Diltiazem) have been added to the list of potential first-line therapy in uncomplicated hypertension, but are cautioned against in clients with heart failure.	Dizziness, headache, nausea, flushing, diarrhea, peripheral edema, bradycardia, CHF, heart block, rash.

CLASS	ACTIONS	INDICATIONS	CONTRAINDICATIONS/CAUTIONS	SIDE EFFECTS
Angiotensin Converting Enzyme (ACE) Inhibitors e.g., ■ Captopril ■ Enalapril ■ Fosinopril ■ Perindopril ■ Quinapril ■ Ramipril	Block ACE from converting angiotensin I to angiotensin II (a powerful vasoconstrictor).	Hypertension without compelling indications for specific agents. Monitor blood work (K⁺, creatinine). First line for people with diabetes, post MI, systolic dysfunction, renal disease.	Hypersensitivity, chronic renal disease caused by bilateral renal artery stenosis, severe CHF, salt/volume depletion, pregnancy. Not recommended as initial monotherapy in black clients, as there is greater risk of angioedema. Can precipitate renal failure in susceptible clients (bilateral renovascular disease, those with volume depletion or with concurrent non-steroidal anti-inflammatory use).	Dry cough, angioedema, gastrointestinal irritation, tachycardia, proteinuria, rash, hyperkalemia.
Angiotensin II Receptor Blockers e.g., ■ Candesartan ■ Irbesartan ■ Losartan ■ Telmisartan ■ Valsartan	Block the binding of angiotensin II to specific tissue receptors found in vascular smooth muscle and adrenal gland. This blocks the vasoconstriction effect of the renin-angiotensin system and release of aldosterone.	Hypertension without compelling indications for specific agents. First line if client cannot tolerate ACE Inhibitors.	Hypersensitivity, pregnancy, lactation. Caution: renal dysfunction, volume depletion.	Angioedema, back pain, abdominal pain, nausea, headache, fatigue, upper respiratory infection (influenza-like symptoms).

References:

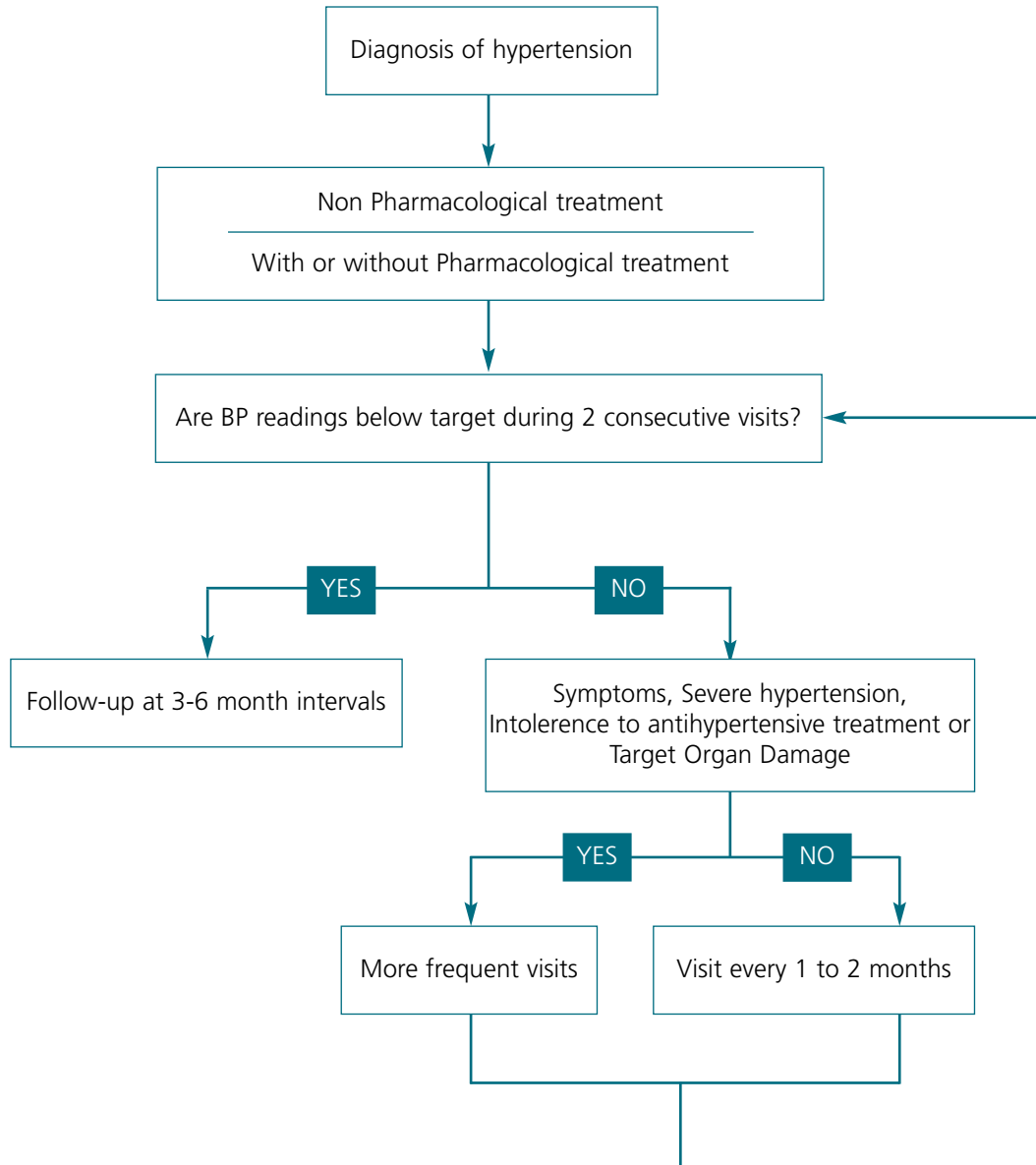
CHEP, 2004, 2005; CMA, 1999; CPS, 2005; Therapeutic Choices, 2000.

- Additional information regarding *Treatment of Hypertension with Compelling Indications* may be found in the 2005 Canadian Recommendations for the Management of Hypertension (CHEP, 2005): www.hypertension.ca
- The *Global Vascular Protection Strategy for Hypertensive Patients* is available at: www.hypertension.ca

Appendix P: Follow-up Algorithm

Reproduced with permission. Canadian Hypertension Education Program Process, 2005.

Recommendations for Follow-up



Appendix Q: Educational Resources

The following educational resources have been compiled by the development panel as a resource for nurses and their clients in learning more about hypertension and its management. It is not intended to be an inclusive listing.

TOPIC	RESOURCES/WEBSITES
Hypertension and Related Associations	<p>American Heart Association: www.americanheart.org</p> <p>American Society of Hypertension: www.ash-us.org</p> <p>British Hypertension Society: www.hyp.ac.uk/bhs/default.htm</p> <p>Canadian Association for Cardiovascular Rehabilitation: www.cacr.ca</p> <p>Canadian Cardiovascular Society: www.ccs.ca</p> <p>Canadian Coalition for Prevention and Control of Hypertension: www.canadianbpcoalition.org</p> <p>Canadian Hypertension Education Program (CHEP): www.hypertension.ca/index2.html</p> <p>Canadian Hypertension Society: www.hypertension.ca</p> <p>Canadian Medical Association: www.cma.ca</p> <p>Canadian Stroke Network: www.canadianstrokenetwork.ca</p> <p>European Society of Hypertension: www.eshonline.org/esh/index.asp</p> <p>Health Canada: www.hc-sc.gc.ca</p> <p>Health Canada – Cardiovascular Disease Division: www.phac-aspc.gc.ca/ccdpc-cpccmc/cvd-mcv/links_e.html</p> <p>Heart and Stroke Foundation of Canada: www.heartandstroke.ca</p> <p>High Blood Pressure Research Council of Australia: www.hbprca.com.au</p> <p>National Heart, Blood and Lung Institute: www.nhlbi.nih.gov</p> <p>Singapore National Heart Association: www.hbprca.com.au</p> <p>World Hypertension League: www.mco.edu/org/whl/pat.html</p>
Educational Resources for the Management of Hypertension	
Heart and Stroke Foundation: www.heartandstroke.ca	<p>The Heart and Stroke Foundation is a national voluntary non-profit organization whose mission is to improve the health of Canadians by preventing and reducing disability and death from heart disease and stroke through research, health promotion and advocacy.</p> <p>BP Tools — Healthy Blood Pressure Tools: www.heartandstroke.ca/bloodpressure</p> <p>This section of the website has a wealth of information, tips and resources to help prevent and control high blood pressure. A free and confidential Blood Pressure Action Plan™ that helps assess personal risk and provides a customized action plan is available at www.heartandstroke.ca. For those without Internet access, a Blood Pressure Action Plan™ and a booklet on blood pressure (item #44802) are available by calling 1-888-473-4636 (1-888-HSF-INFO).</p>

TOPIC	RESOURCES/WEBSITES
Healthy Heart Kit	The “Healthy Heart Kit” is a risk management and patient education kit for the prevention of cardiovascular disease and the promotion of cardiovascular health: www.phac-aspc.gc.ca/ccdpc-qpcmc/hhk-tcs/index.html
Hypertension Online	An educational resource for reliable information and tools relevant to the field of hypertension: www.hypertensiononline.org
Continuing Medical Education Inc.	The “CV Toolbox” is an education resource that provides guidelines, tools and information sheets online: www.cvtoolbox.com
Heart Health Resource Centre	Best and Promising Practices Toolkit: www.hhrc.net/bpt/index.cfm
Healthy Eating	Center for Science in the Public Interest: www.cspinet.org/nah/dash.htm Diet-a-Dietician: www.dietadietician.org Dietitians of Canada: www.dietitians.ca Facts About the DASH Eating Plan: www.nhlbi.nih.gov/health/public/heart/hbp/dash/new_dash.pdf
Healthy Weight	Heart and Stroke Foundation — Your Health Tools: www.heartandstroke.ca/Page.asp?PageID=1180 <ul style="list-style-type: none"> ■ BMI Calculator ■ Waist Circumference Calculator ■ Food and Fitness Calculator Health Canada: www.hc-sc.gc.ca <ul style="list-style-type: none"> ■ Canadian Guidelines for Body Weight Classification in Adults – Quick Reference Tool for Professionals: www.hc-sc.gc.ca/hpfb-dgpsa/onpp-bppn/eg_quick_reference_e.html
Smoking Cessation	Canadian Cancer Society: www.cancer.ca/tobacco Canadian Council on Tobacco Control: www.cctc.ca Ontario Campaign for Action on Tobacco: www.ocat.org Physicians for a Smoke-Free Canada: www.smoke-free.ca Program Training and Consultation Centre: www.ptcc.on.ca.ca Registered Nurses’ Association of Ontario: www.mao.org/bestpractices University of Geneva: www.stop-tabac.ch/en.welcome.html <i>Recommended sites by professionals in Tobacco cessation:</i> <ul style="list-style-type: none"> ■ Mayo Clinic – Nicotine Dependence Center: www.mayoclinic.org/hdc-rst ■ QuitNet: www.quitnet.com/?redir=http://www.tepp.org/quit/cesslinks.html ■ Sick of Smoke: www.sickofsmoke.com/pgs/ads.html ■ Database and Educational Resource for Treatment of Tobacco Dependence (Treat Tobacco): www.treattobacco.net/home/home.cfm ■ Center for Tobacco Research and Intervention: www.ctri.wisc.edu ■ Tobacco Information and Prevention Source (TIPS): www.cdc.gov/tobacco/sgr/sgr_2004/index.htm ■ National Cancer Institute – Tobacco Control Research: http://dcccps.nci.nih.gov/tcrb/guide_measures.html ■ International Network of Women Against Tobacco: www.inwat.org/inwatnewsletter.htm

TOPIC	RESOURCES/WEBSITES
Alcohol	<p>Alcoholics Anonymous: www.alcoholics-anonymous.org</p> <p>Alcohol Policy Network: www.apolnet.org</p> <p>Canadian Centre on Substance Abuse: www.ccsa.ca</p> <p>Centre for Addiction and Mental Health: www.camh.net</p> <p>Health Canada: www.hs-sc.gc.ca</p>
Stress	<p>Stress Directions – The Stress Knowledge Company: www.stressdirections.com</p> <p>Provides information about susceptibility to stress, sources and symptoms of stress and specific actions to take to manage stress.</p> <p>This site provides a scientifically developed and clinically tested online Personal Stress Navigator program.</p>
Drug Information	<p>Health Canada Drug Products Database: www.hc-sc.gc.ca/hpb/drugs-dpd</p> <p>Health Canada Therapeutic Products Directorate: www.hc-sc.gc.ca/hpfb-dgpsa/tpd-dpt</p> <p>Healthy Ontario.com Drug Database: www.healthyontario.com/english/index.asp</p> <p>MedLine Plus Drug Information: www.nlm.nih.gov/medlineplus/druginformation.html</p> <p>Ontario Drug Benefit Formulary: www.health.gov.on.ca/english/providers/program/drugs/odbf_mn.html</p> <p>Ontario Drug Benefit Plan: www.health.gov.on.ca/english/public/program/drugs/drugs_mn.html</p> <p>Trillium Drug Program: www.health.gov.on.ca/english/pub/drugs/trillium.html</p>
Risk Prediction Models	<p>American Heart Association – Blood Pressure Risk Calculator: www.americanheart.org/presenter.jhtml?identifier=3027275</p> <p>CV Tool Box has several risk calculators available: www.cvtoolbox.com</p> <p>Framingham Risk Model: http://hin.nhlbi.nih.gov/atpiii/calculator.asp</p> <p>Heart to Heart (uses the Framingham Equations): www.med-decisions.com/cvtool/active/provider/provider.html</p> <p>Heart Score: www.escardio.org/initiatives/prevention/HeartScore.htm</p> <p>Montreal Cardiovascular Health Improvement Program: www.chiprehab.com/CVD</p> <p>ProCam Risk Calculator: http://chdrisk.uni-muenster.de/calculator.php</p>
Validation Protocols	<p>Association for the Advancement of Medical Instrumentation: www.aami.org</p> <p>British Hypertensive Society Protocol: http://www.bhsoc.org/blood_pressure_list.htm</p> <p>International Protocol: http://www.eshonline.org/pdf/International_PS_2002.04.29.pdf</p>

Appendix R: Description of the Toolkit

Best practice guidelines can only be successfully implemented if there are: adequate planning, resources, organizational and administrative support as well as appropriate facilitation. In this light, RNAO, through a panel of nurses, researchers and administrators has developed the *Toolkit: Implementation of Clinical Practice Guidelines* based on available evidence, theoretical perspectives and consensus. The *Toolkit* is recommended for guiding the implementation of any clinical practice guideline in a healthcare organization.

The Toolkit provides step-by-step directions to individuals and groups involved in planning, coordinating, and facilitating the guideline implementation. Specifically, the *Toolkit* addresses the following key steps in implementing a guideline:

1. Identifying a well-developed, evidence-based clinical practice guideline.
2. Identification, assessment and engagement of stakeholders.
3. Assessment of environmental readiness for guideline implementation.
4. Identifying and planning evidence-based implementation strategies.
5. Planning and implementing evaluation.
6. Identifying and securing required resources for implementation.

Implementing guidelines in practice that result in successful practice changes and positive clinical impact is a complex undertaking. The *Toolkit* is one key resource for managing this process.

The *Toolkit* is available through the Registered Nurses' Association of Ontario. The document is available in a bound format for a nominal fee, and is also available free of charge from the RNAO website. For more information, an order form or to download the *Toolkit*, please visit the RNAO website at www.rnao.org/bestpractices.

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July 2009

Nursing Best Practice Guideline



Nursing Management of Hypertension

Guideline supplement

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Supplement Integration

Similar to the original guideline publication, this document needs to be reviewed and applied, based on the specific needs of the organization or practice setting/environment, as well as the needs and wishes of the client. This supplement should be used in conjunction with the guideline as a tool to assist in decision making for individualized client care, as well as ensuring that appropriate structures and supports are in place to provide the best possible care.

Background

Hypertension is a complex, chronic condition that is often referred to as the “silent killer”. The recently completed Heart and Stroke Foundation of Ontario (2009) survey of blood pressure awareness treatment and control found unprecedented levels of blood pressure control with two out of three people with hypertension under control. However, for people with diabetes rates of control were only one in three, with two thirds above the target of less than 130/80 mmHg. Nurses working in partnership with the interprofessional health care team, clients and their families, have an important role in the detection and management of hypertension.

Revision Process

A panel of nurses was assembled for this review, comprised of members from the original development panel as well as other recommended individuals with particular expertise in this practice area. A structured evidence review based on the scope of the original guideline was conducted to capture the relevant literature and other guidelines published. Initial findings regarding the impact of the current evidence, based on the original guideline, were developed and circulated to the review panel. The review panel members were given a mandate to review the original guideline in light of the new evidence, specifically to ensure the validity, appropriateness and safety of the guideline recommendations as published in 2005. In February 2009, the panel was convened to achieve consensus on the need to revise the existing recommendations.



Review of Existing Guidelines

One individual searched an established list of websites for guidelines and other relevant content. This list was compiled based on existing knowledge of evidence-based practice websites and recommendations from the literature.

Members of the panel critically appraised eight international guidelines, published since 2004, using the “Appraisal of Guidelines for Research and Evaluation” (AGREE, 2001). From this review, three guidelines were identified to be included in the review process and were circulated to all review panel members:

Scottish Intercollegiate Guidelines Network (SIGN), (2005).
Hypertension in older people: A national clinical guideline.
Edinburgh: SIGN (SIGN publication no. 49).

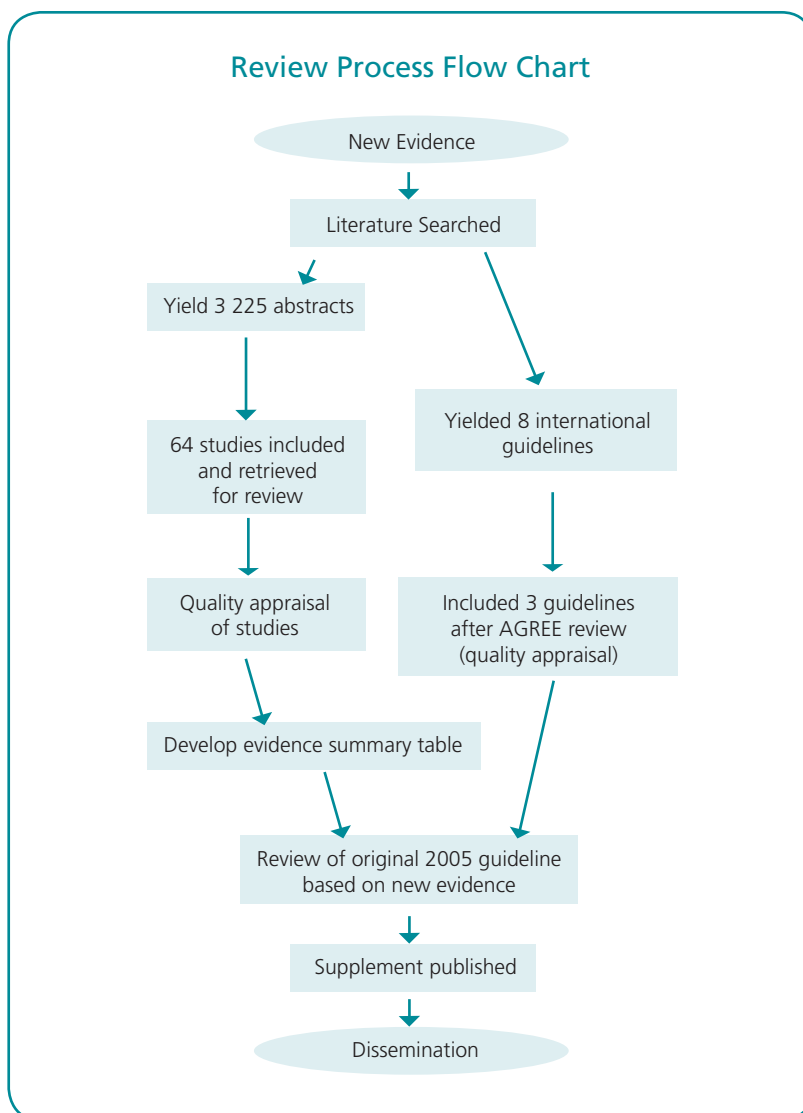
Canadian Hypertension Society, (2009). The 2009 CHEP
recommendations for the management of hypertension:
Canadian Hypertension Education Program. Retrieved from
www.hypertension.ca.

National Institute for Health and Clinical Excellence (NICE),
(2006). Management of hypertension in adults in primary care.
London: NICE (clinical guideline 34). Retrieved from
www.nice.org.uk/cg034.

Literature Review

Concurrent with the review of existing guidelines, a search for recent literature relevant to the scope of the guideline was conducted with guidance from the Team Leader. The search of electronic databases, (CINAHL, Medline and EMBASE), was conducted by a health sciences librarian. A Research Assistant (Master's prepared nurse) completed the inclusion/exclusion review, quality appraisal and data extraction of the retrieved studies, and prepared a summary of the literature findings. The comprehensive data tables and reference lists were provided to all panel members.

A summary of the evidence review is provided in the flow chart below:



Review Findings

A review of the most recent studies and relevant guidelines published since the development of the original guideline does not support changes to the recommendations, but rather suggests stronger evidence for our approach to nursing management of hypertension. The revision panel members suggest some minor revisions to Appendix O and Q in the original guideline, as seen in the following tables:



Appendix O: Summary of Medication Classes Prescribed for Hypertension

The following appendix has been updated and replaces the chart found on pages 125 and 126 of the original guideline.

SUMMARY OF MEDICATION CLASSES PRESCRIBED FOR HYPERTENSION				
CLASS	ACTIONS	INDICATIONS	CONTRAINDICATIONS/ CAUTIONS	SIDE EFFECTS
Thiazide Diuretics e.g. <ul style="list-style-type: none"> • Chlorthalidone • Hydrochlorothiazide • Indapamide • Metolazone 	Inhibit reabsorption of sodium and chloride in the distal renal tubule. Increase the excretion of sodium, chloride and water by the kidney.	Hypertension without compelling indications for specific agents. Recommended as first line. Monitor bloodwork (Na+, K+, creatinine) q6-12 months. Hypokalemia can be avoided by using potassium sparing diuretics (e.g., Hydrochlorothiazide with Amiloride, Triamterene, Spironolactone) or with potassium supplementation.	Hypersensitivity, fluid or electrolyte imbalances, renal or hepatic impairment, gout, glucose tolerance abnormalities, predisposition to serious arrhythmias.	Hypokalemia (<3.5mmol/L), hyponatremia (<120mmol/L), dizziness, vertigo, orthostatic hypotension, nausea, headache, polyuria, nocturia, gout, erectile dysfunction, hyperglycemia. Hyperkalemia with potassium sparing diuretics. *(see caution on next page)
Beta-Blockers e.g. <ul style="list-style-type: none"> • Acebutolol • Atenolol • Bisoprolol • Esmolol • Metoprolol • Nadolol • Oxprenolol • Pindolol • Propanolol • Sotalol • Timolol 	Competitively block Beta-Adrenergic receptors in the heart and juxtaglomerular apparatus. Decrease the influence of the sympathetic nervous system on these tissues, inhibit the release of renin and lower blood pressure.	Hypertension without compelling indications for specific agents. First line in clients under 60 years of age, post myocardial infarction (MI), in clients with systolic dysfunction and stable angina.	Hypersensitivity, asthma or reversible airway obstruction, sinus bradycardia, heart block in absence of pacemaker, peripheral vascular disease, congestive heart failure (CHF). May mask warning signs of hypoglycemia. Not recommended as initial monotherapy for clients over 60 years of age.	Gastrointestinal symptoms, dyspnea, bradycardia, fatigue, nausea, dizziness, erectile dysfunction.
Long-acting Calcium Channel Blockers (CCB's) e.g. <i>Dihydropyridine (DHP)</i> <ul style="list-style-type: none"> • Amlodipine • Felodipine (Extended Release) • Nifedipine (Extended Release) <i>Non DHP</i> <ul style="list-style-type: none"> • Diltiazem • Verapamil 	Inhibit the movement of calcium ions across the membranes into cardiac and arterial muscle cells, resulting in vasodilation.	Hypertension without compelling indications for specific agents. May be used as initial therapy but usually used as combination therapy.	Hypersensitivity, heart block, ventricular dysfunction, bradycardia, pregnancy. Non-DHP CCB's (Verapamil, Diltiazem) have been added to the list of potential first-line therapy in uncomplicated hypertension, but are cautioned against in clients with heart failure. Exercise caution in combining Non-DHP CCB and beta-blocker.	Dizziness, headache, nausea, flushing, diarrhea, peripheral edema, bradycardia, CHF, heart block, rash.

SUMMARY OF MEDICATION CLASSES PRESCRIBED FOR HYPERTENSION

CLASS	ACTIONS	INDICATIONS	CONTRAINDICATIONS/CAUTIONS	SIDE EFFECTS
<p>Angiotensin Converting Enzyme (ACE) Inhibitors e.g.</p> <ul style="list-style-type: none"> • Benazepril • Captopril • Cilazapril • Enalapril • Fosinopril • Lisinopril • Perindopril • Ramipril • Trandolapril 	<p>Block ACE from converting angiotensin I to angiotensin II (a powerful vasoconstrictor).</p>	<p>Hypertension without compelling indications for specific agents.</p> <p>Monitor blood work (K+, creatinine).</p> <p>First line for clients with diabetes, post MI, systolic dysfunction, renal disease.</p>	<p>Hypersensitivity, impaired renal function, severe CHF, salt/volume depletion, women of child bearing potential.</p> <p>Not recommended as initial monotherapy in black clients, as there is greater risk of angioedema.</p> <p>Can precipitate renal failure in susceptible clients (bilateral reno-vascular disease, those with volume depletion or with concurrent non-steroidal anti-inflammatory use).</p> <p>Combination of ACE and ARB not recommended.</p>	<p>Dry cough, angioedema, gastrointestinal irritation, tachycardia, proteinuria, rash, hyperkalemia.</p>
<p>Angiotensin II Receptor Blockers e.g.</p> <ul style="list-style-type: none"> • Candesartan • Eprosartan • Irbesartan • Losartan • Telmisartan • Valsartan 	<p>Block the binding of angiotensin II to specific tissue receptors found in vascular smooth muscle and adrenal gland. This blocks the vasoconstriction effect of the renin-angiotensin system and release of aldosterone.</p>	<p>Hypertension without compelling indications for specific agents.</p> <p>First line if client cannot tolerate ACE Inhibitors.</p> <p>First line for clients with diabetes.</p>	<p>Hypersensitivity, women of child bearing potential, lactation. Caution: renal dysfunction, volume depletion.</p>	<p>Angioedema, back pain, abdominal pain, nausea, headache, fatigue, upper respiratory infection (influenza-like symptoms).</p>

References: Canadian Hypertension Education Program, 2009; Gray, 2007.

***Caution: monitor potassium when using potassium-sparing diuretics (e.g., Amiloride, Triamterene, Spironolactone).**

Appendix Q: Educational Resources

The following appendix has been updated and replaces the chart found on pages 128 to 130 of the original guideline.

TOPIC	RESOURCES AND WEBSITES
Canadian Hypertension Resources	<p>Canadian Hypertension www.hypertension.ca This website represents the three key organizations for hypertension in Canada. It contains a wealth of information for health professionals, researchers and the general public and is a portal to access the most up-to-date hypertension information in Canada. For a comprehensive list of content visit the site regularly.</p> <p>Blood Pressure Canada www.hypertension.ca</p> <ul style="list-style-type: none"> • Public Recommendations • Educational Tools • Videos • Newsletters <p>Canadian Hypertension Education Program (CHEP) www.hypertension.ca</p> <ul style="list-style-type: none"> • Annual Recommendations • Publications • Slidesets • Posters • Linkages of interest • Approved BP Devices • Video <p>Canadian Hypertension Society (CHS) www.hypertension.ca</p> <ul style="list-style-type: none"> • Research Opportunities • Grants and Awards • Resource Centre • Device Endorsements
Other Guideline Sources	<p>British Hypertension Society www.bhsoc.org</p> <p>European Society of Hypertension www.eshonline.org</p> <p>International Society of Hypertension www.ish-world.com</p> <p>The Seventh Report of the Joint National Committee www.nhlbi.nih.gov/guidelines/hypertension/jnc7full.htm</p> <p>National Institute for Health and Clinical Evidence (NICE) www.nice.org.uk/Guidance/CG34</p> <p>Scottish Intercollegiate Guidelines Network (Hypertension in Older People) www.sign.ac.uk/guidelines/fulltext/49/index.html</p> <p>World Health Organization, Cardiovascular Diseases www.who.int/cardiovascular_diseases</p>
General Resources for Health Professionals about Hypertension	<p>American Heart Association www.americanheart.org</p> <p>American Society of Hypertension www.ash-us.org</p> <p>Canadian Association for Cardiovascular Rehabilitation www.cacr.ca</p> <p>Canadian Cardiovascular Society www.ccs.ca</p> <p>Canadian Diabetes Association www.diabetes.ca</p> <p>Canadian Medical Association www.cma.ca</p> <p>Canadian Stroke Network www.canadianstrokenetwork.ca</p>

TOPIC	RESOURCES AND WEBSITES
	<p>Canadian Women's Health Network www.cwhn.ca/resource</p> <p>Dietitians of Canada www.dietitians.ca</p> <p>Health Canada www.hc-sc.gc.ca</p> <p>Health Canada – Centre for Chronic Disease Prevention and Control www.phac-aspc.gc.ca/ccdpc-cpcmc/cvd-mcv/links_e.html</p> <p>Heart and Stroke Foundation of Canada www.heartandstroke.ca</p> <p>Hypertension Online www.hypertensiononline.org</p> <p>International Hypertension Society www.ish-world.com</p> <p>Kidney Foundation of Canada www.kidney.ca</p> <p>Lipids Online www.lipidsonline.org</p> <p>The National Heart, Lung and Blood Institute (US resource) www.nhlbi.nih.gov/health</p> <p>World Hypertension League www.worldhypertensionleague.org</p>
<p>Educational Resources for the Management of Hypertension</p> <p>Heart and Stroke Foundation www.heartand-stroke.ca</p> <p>Healthy Heart Kit</p> <p>Hypertension Online</p> <p>Continuing Medical Education Inc.</p> <p>Heart Health Resource Centre</p> <p>Registered Nurses' Association of Ontario</p>	<p>The Heart and Stroke Foundation is a national voluntary non-profit organization whose mission is to improve the health of Canadians by preventing and reducing disability and death from heart disease and stroke through research, health promotion and advocacy.</p> <p>BP Tools — Healthy Blood Pressure Tools www.heartandstroke.ca/bp</p> <p>This section of the website has a wealth of information, tips and resources to help prevent and control high blood pressure. The free and confidential Blood Pressure Action Plan™ that helps assess personal risk and provides a customized action plan. For those without Internet access, a Blood Pressure Action Plan™ and a booklet on blood pressure (item #44802) are available by calling 1-888-473-4636 (1-888-HSF-INFO).</p> <p>The “Healthy Heart Kit” is a risk management and patient education kit for the prevention of cardiovascular disease and the promotion of cardiovascular health www.phac-aspc.gc.ca/ccdpc-cpcmc/hhk-tcs/index.html</p> <p>An educational resource for reliable information and tools relevant to the field of hypertension www.hypertensiononline.org</p> <p>The “CV Toolbox” is an education resource that provides guidelines, tools and information sheets online www.cvtoolbox.com</p> <p>Best and Promising Practices Toolkit www.hhrc.net/home.cfm</p> <p>This e-learning course, Nursing Management of Hypertension Guideline, is designed to support nurses integrate evidence-based recommendations into nursing practice. This course is appropriate for nurses working in a variety of practice settings who are not necessarily experts in hypertension management www.rnao.org/hypertension</p>

TOPIC	RESOURCES AND WEBSITES
Healthy Eating	<p>Center for Science in the Public Interest www.cspinet.org/nah/dash.htm</p> <p>Dial-a-Dietician www.dialadietitian.org</p> <p>Dietitians of Canada www.dietitians.ca</p> <p>Facts About the DASH Eating Plan www.nhlbi.nih.gov/health/public/heart/hbp/dash/new_dash.pdf</p> <p>Sodium 101 www.sodium101.ca</p>
Healthy Weight	<p>Alberta Health Services Tools and Calculators www.capitalhealth.ca/EspeciallyFor/WeightWise/ToolsandCalculators/default.htm</p> <p>Canadian Guidelines for Body Weight Classification in Adults – Quick Reference Tool for Professionals www.hc-sc.gc.ca/fn-an/alt_formats/hpfb-dgpsa/pdf/nutrition/weight_book-livres_des_poids-eng.pdf</p> <p>Healthy Eating Health Canada www.hc-sc.gc.ca</p> <p>Heart and Stroke Foundation — Your Health Tools www.heartandstroke.ca</p>
Smoking Cessation	<p>Canadian Cancer Society www.cancer.ca/tobacco</p> <p>Canadian Council on Tobacco Control www.cctc.ca</p> <p>Ontario Campaign for Action on Tobacco www.ocat.org</p> <p>Ontario Tobacco Research Unit www.otru.org</p> <p>Physicians for a Smoke-Free Canada www.smoke-free.ca</p> <p>Program Training and Consultation Centre A resource of Smoke Free Ontario www.ptcc-cfc.on.ca</p> <p>Registered Nurses' Association of Ontario www.rnao.org/bestpractices and www.tobaccofreernao.ca</p> <p>Tobacco Free Nurses www.tobaccofreenurses.org</p>
Alcohol	<p>Alcoholics Anonymous www.alcoholics-anonymous.org</p> <p>Alcohol Policy Network www.apolnet.org</p> <p>Canadian Centre on Substance Abuse www.ccsa.ca</p> <p>Centre for Addiction and Mental Health www.camh.net</p> <p>Health Canada www.hc-sc.gc.ca/hl-vs/alc/index-eng.php</p>
Stress	<p>Stress Directions – The Stress Knowledge Company www.stressdirections.com</p> <p>Provides information about susceptibility to stress, sources and symptoms of stress and specific actions to take to manage stress. This site provides a scientifically developed and clinically tested online Personal Stress Navigator program.</p>
Drug Information	<p>Health Canada Drug Products Database www.hc-sc.gc.ca/hpb/drugs-dpd</p> <p>Health Canada Therapeutic Products Directorate www.hc-sc.gc.ca/ahc-asc/branch-dirigen/hpfb-dgpsa/tpd-dpt/index-eng.php</p> <p>Healthy Ontario.com Drug Database www.healthyontario.com</p> <p>MedLine Plus Drug Information www.nlm.nih.gov/medlineplus/druginformation.html</p>

TOPIC	RESOURCES AND WEBSITES
	<p>Ontario Drug Benefit Formulary www.health.gov.on.ca/english/providers/program/drugs/odbf_mn.html</p> <p>Ontario Drug Benefit Plan www.health.gov.on.ca/english/public/program/drugs/drugs_mn.html</p> <p>Trillium Drug Program www.health.gov.on.ca/english/public/pub/drugs/trillium.html</p>
<p>Cardiovascular Risk Prediction Models</p> <p>American Heart Association – Blood Pressure Risk Calculator</p> <p>Score Canada Cardiovascular Risk Assessment Tool</p>	<p>www.americanheart.org/presenter.jhtml?identifier=3027275</p> <p>CV Tool Box has several risk calculators available www.cvtoolbox.com</p> <p>Framingham Risk Model http://hin.nhlbi.nih.gov/atpiii/calculator.asp</p> <p>Heart to Heart (uses the Framingham Equations) www.med-decisions.com/cvtool/active/provider/provider.html</p> <p>Heart Score www.heartscore.org/Pages/welcome.aspx</p> <p>International Task Force on the Prevention of Coronary Disease www.chd-taskforce.com</p> <p>Systematic Cerebrovascular and Coronary Risk Evaluation (SCORE CANADA) www.scorecanada.ca</p>
<p>Approved Blood Pressure Devices and Validation Protocols</p>	<p>Association for the Advancement of Medical Instrumentation www.aami.org</p> <p>British Hypertensive Society Protocol www.bhsoc.org/bp_monitors/automatic.stm</p> <p>Canadian Hypertension Society www.hypertension.ca/chs/deviceendorsements/devices-endorsed-by-chs</p> <p>International Protocol www.eshonline.org/pdf/International_PS_2002.04.29.pdf</p>

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