

### **Dementia Phased Pathway: Pre-Clinical Phase Preventing Dementia: Heart Smart = Brain Smart!**

#### **Background:**

Brain health is essential to quality of life throughout the life course. There is a growing body of research evidence associating various activity lifestyle factors with the prevention of cognitive decline. Because most of these risk factors are self-manageable, health practitioners are being challenged to re-think a primary and secondary prevention approach to help client's achieve and maintain cognitive vitality in later life.

**This edition of "In Focus!" provides key pieces of evidence that link vascular health to brain health, and demonstrates why lifestyle behaviours that support healthy hearts are also associated with lower risk for cognitive loss and dementia.**

#### *Did you know...?*

- Cardiovascular disease is the leading cause of death worldwide. Each year 79,000 Canadians die from heart disease and stroke<sup>1</sup>. Some scientists estimate that one out of four Canadians living now has some type of cardiovascular disorder.
- There are nine risk factors that account for 90% of the world's cardiovascular disease. This means that no matter where you live in the world and which ethnic or cultural group you belong to, the exact same factors predict your likelihood of developing cardiovascular disease.
- Contrary to previous belief, studies show that heredity does not play a significant role in the likelihood of developing cardiovascular disease.
- Good health is determined by what we do: 90% of heart disease is caused by modifiable risk factors. The INTERHEART study indicates that changes in lifestyle regardless of gender, geographic region and ethnicity can significantly modify cardiovascular risk.



#### *Key Clinical Messages:*

- Cardiovascular risk factors are dementia risk factors! Cardiovascular disease is preventable.
- The two most important risk factors are cigarette smoking and an abnormal ratio of blood lipids
- Additional risk factors are high blood pressure, diabetes, abdominal obesity, stress, a lack of daily consumption of fruits and vegetables and a lack of daily exercise. Regular consumption of small amounts of alcohol was also found to be modestly protective.

\* See page 4-7 for detailed research evidence supporting these key clinical messages

### SECTION I: Identifying Clinical Issues

#### 1) The Relationship between Heart, Brain and Dementia: Cerebrovascular Burden

The health of the two vital organs, heart and brain, are invariably linked with each other. The large (atherosclerosis) and small (arteriosclerosis) vessel damage that is associated with both cardiovascular and cerebrovascular disease, results in numerous vascular disorders such as hypertension, myocardial infarction, and ischemic stroke associated with thrombosis. These disorders can result in a gradual or abrupt loss of blood flow to the brain and significantly increase the vascular burden on the brain and risk for both vascular and neurodegenerative dementias.

The development of cerebrovascular disease is a significant determinant in the loss of brain health. Cerebrovascular disease is the second most common cause of acquired cognitive impairment and dementia. Research now shows that vascular-related dementias are a wide and heterogeneous collection of disorders. In a parallel analogy to the classifications of Alzheimer's disease, vascular dementias have both genetic and non-genetic etiologies. The hereditary collection of vascular dementias known as CADASILs (cerebral autosomal dominant arteriopathy with subcortical infarcts and leucoencephalopathy) are autosomal dominant cerebral arteriopathies. There are also vascular dementias with a non-genetic etiology that occur in later life. They include vascular cognitive impairment, multi-infarct dementia (the original "step-wise" deterioration), post-stroke dementia, and sub-cortical ischemic vascular dementia.

The degenerative dementias, which include Alzheimer's disease (AD), fronto-temporal dementia (FTD) and dementia with Lewy bodies (DLB), are now understood to have a much larger vascular component to their underlying pathophysiology. In fact, cerebrovascular small vessel disease is now believed to be the major source of vascular burden of the brain, and is strongly associated as a co-morbidity with Alzheimer's disease. The results are "mixed" dementias with both vascular and neurodegenerative presentations.

#### Mechanisms of Action

Cerebrovascular diseases can cause cognitive impairment and dementia by loss of neurons and synaptic connections, destruction of axons, and demyelination. There are a number of mechanisms by which this occurs: arterial stiffness<sup>2,3</sup>, white matter lesions, and stroke. Recent research<sup>3</sup> shows a significant relationship between arterial stiffness and cognitive impairment, suggesting that functional changes of the arterial system could be involved in the onset of dementia (VaD or AD types). In another study, arterial stiffness was associated with cognitive impairment in older subjects and with a greater personal dependency (ADLs and IADLs), independently of major modifiable CV risk factors<sup>3</sup>

#### Stroke

Stroke is the third leading cause of death in Western nations, and the leading cause of adult neurological disability. There is a large body of research evidence that recurrent ischemic stroke can be prevented. There are six important stroke risk factors (**hypertension, myocardial infarction (MI), atrial fibrillation, diabetes mellitus, elevated blood lipids and asymptomatic carotid artery stenosis.**) and 4 lifestyle factors (**cigarette smoking, alcohol use, physical activity and diet**).

Current guidelines indicate that modifying lifestyle-related risk factors is an important measure in *preventing* both a first stroke and stroke reoccurrence. Recent research indicates that cognition is rather stable for 2 years after stroke although progressive long term cognitive decline occurs in approximately 30% of stroke patients. Age, previous cognitive decline, poly-pharmacy, and hypotension during acute admission are risk factors for progression of cognitive loss following stroke<sup>4</sup>.

### **2) The Burden of Cardiovascular Disease:**

#### **a) Nine cardiovascular factors that can save lives**

Cardiovascular disease is the leading cause of death worldwide. Most significantly 90% of heart disease is now believed to be influenced by modifiable lifestyle behaviours, and only a small portion results from genetic inheritance. This means that cardiovascular disease is preventable, and promoting public understanding and knowledge of cardiovascular risk factors as the root causes for heart attack and stroke is critical.

In September 2004, a major Canadian-led global study on cardiovascular disease was published by researchers from the Population Health Research Institute at McMaster University and the Hamilton Health Sciences Centre. The INTERHEART study<sup>5</sup> involved over 30,000 people of diverse ethnic and cultural groups in 52 countries from across the world. The purpose of this study is to develop a global strategy to prevent cardiovascular disease at a population health level.

The results from this large international study found that the vast majority of heart attacks may be predicted by nine easily measurable factors and that these factors are the same in virtually every region and ethnic group. The nine modifiable factors are:

1. Smoking
2. Abnormal lipid ratio (Apolipoprotein B/Apolipoprotein A-1)
3. Hypertension
4. Diabetes
5. Size of your waistline (abdominal obesity)
6. Psychosocial factors (e.g. depression and stress)
7. Lack of fruits and vegetables
8. Lack of physical exercise
9. Level of alcohol consumption

The two most important risk factors are cigarette smoking and an abnormal ratio of blood lipids, which together predicted two-thirds of the global risk of heart attack. Additional risk factors are high blood pressure, diabetes, abdominal obesity, stress, a lack of daily consumption of fruits and vegetables and a lack of daily exercise. Regular consumption of small amounts of alcohol was also found to be modestly protective (see module on alcohol and brain health!) Worldwide, these nine factors collectively predict more than 90 per cent of the risk of a heart attack. The Canadian Heart and Stroke Foundation recently reported that eight out of 10 Canadians have at least one of these risk factors for developing heart disease or stroke.

The important and positive message in this research is that much more than previously believed, cardiovascular risk is not so much inherited as it is a result of modifiable lifestyle behavioural risk factors. Cardiovascular risk is therefore preventable, and in this way significantly reducing cardiovascular risk can by association, significantly reduce the risk for cardiovascular-related cognitive loss and dementias.

### b) The relationship between known cardiovascular risk factors and dementia:

A brief outline of key evidence (level 1 and level 2<sup>†</sup>) for each of the 9 identified cardiovascular risk factors is presented below:

#### 1. Smoking<sup>‡</sup>:

- *smoking, in a dose-dependent fashion, is associated with an increase in cognitive decline, which can begin in mid-life<sup>6</sup>;*
- *smoking is significantly associated with various dementia types (Alzheimer, vascular, etc.) in later life<sup>6,7</sup>*
- *heavier smoking is associated with an accelerated rate of cognitive decline<sup>6,7</sup>*
- *mortality from dementia is greater among smokers than non-smokers<sup>8</sup>*

#### 2. Abnormal Lipid Ratios (dyslipidemia):

- *Dietary fat is implicated in the etiology of many chronic diseases, including cardiovascular disease, type II diabetes and obesity, all of which are independent risk factors for dementia*
- *the consumption of non-hydrogenated fish oils is associated with decreased risk for both degenerative (Alzheimers) and vascular dementia as well as an improvement in cognitive functioning<sup>9</sup>, particularly for those individuals without the apoE-ε4 allele<sup>10</sup>;*
- *dietary Omega-3 polyunsaturated fatty acids are associated with reduced risk for Alzheimer disease, dementia and improved cognitive function<sup>11</sup>, however there are other similar studies<sup>12</sup> that refute these findings. Two systemic reviews have concluded that this evidence is inconclusive at this time<sup>13,69</sup>.*
- *Unsaturated fats and n-3 double bonds (e.g., fish oils) are thought to confer protection from Alzheimer Disease by reducing brain inflammation, while an overabundance of saturated fats or n-6 double bonds is believed to increase the risk for Alzheimer Disease<sup>14</sup>.*
- *The association between plasma lipid ratios such as LDL/ HDL (low-density “bad” to high-density or “good”) ratios, or apoB/apoA-1 ratios and dementia or cognitive impairment is not well-defined in the research literature;*
- *However, the measurement of plasma apolipoproteins (Lipid ratios of apolipoprotein B/apolipoprotein A-1, particularly high apoB in relation to low apoA-1) is strongly predictive of the risk for cardiovascular diseases such as myocardial infarction<sup>15</sup> and stroke<sup>16</sup>., both of which are well-established risk factors for dementia.*

#### 3. Hypertension:

- *Hypertension is a risk factor for stroke<sup>17</sup>, ischemic white-matter lesions, and other cardiovascular disorders, all of which are associated pathologies for Alzheimer disease and vascular dementia*
- *Hypertension often clusters with other vascular risk factors, including diabetes mellitus, obesity, and hypercholesterolemia<sup>18</sup>, all of which are associated with cognitive decline and dementia*
- *A history of hypertension may be an antecedent to vascular dementia, particularly in the presence of heart disease or diabetes<sup>21,22</sup>*

<sup>†</sup> Ebell MH, Siwek J, Weiss BD, Woolf SH, Susman J, Ewigman B, & Bowman M. Simplifying the language of evidence to improve patient care: Strength of Recommendation Taxonomy (SORT): A patient-centered approach to grading evidence in the medical literature. *The Journal of Family Practice* 2004;53(2):111-120, available in the public domain from <http://www.aafp.org/afp/20040201/548.pdf>

<sup>‡</sup> For more detailed information on the relationship between smoking and dementia, see the separate issue of “In Focus!: Smoking and Cognition” located on the IH Intranet site at: <http://insidenet.interiorhealth.ca/NR/rdonlyres/4BAD12CF-0150-486D-8B48-2261BBF7869A/16002/InfocusSmokingandCognition.pdf> or contact Elisabeth Antifeau, Clinical Lead for Dementia at 250-354-2883

Written by: Interior Health Dementia Clinical Practice Working Group

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- High systolic blood pressure at midlife is independently associated with a 24% increased risk of late-life dementia<sup>19,20</sup>; and is an aggregate risk factor associated with Alzheimer Disease<sup>21</sup>

However, the role of blood pressure (BP) as a risk factor for dementia is complex and may be age dependent. In very old individuals, **low BP** is associated with an increased risk for dementia, potentially by reducing cerebral perfusion pressure. Evidence of this includes:

- Hypertension precedes Alzheimer's disease (AD) by decades, but blood pressure **decreases** the years before dementia onset and is **lower** in individuals with AD than in controls<sup>22</sup>;
- In individuals with known vascular disease, there is a dose-response relationship between systolic pressure decline and the risk of dementia<sup>23</sup>
- **Low** diastolic pressure is associated with higher risk of dementia in elderly individuals over age 75. Dementia risk is higher in subjects with **persistently low BP**<sup>24, 25</sup>

#### 4. Diabetes:

- Type 2 diabetes (DM2) is associated with increased odds of poor cognitive function and substantial cognitive decline, particularly for clients who have had diabetes for a long time<sup>26</sup>;
- Individuals with diabetes (DM2) have a 1.2- to 1.5-fold greater change over time in measures of cognitive function than those without diabetes<sup>27</sup>;
- Type 2 diabetes (DM2) at midlife is associated with cognitive impairment and dementia (when other cardiovascular risk factors are controlled for) up to three decades later in life<sup>28</sup>.
- Type 2 diabetes is a risk factor for both Alzheimer disease<sup>29</sup> and vascular dementia<sup>30</sup>, and is believed to be due to dual pathology involving both cerebrovascular disease and cortical atrophy<sup>31</sup>
- the association between diabetes and AD is particularly strong for APOE ε4 carriers<sup>30</sup>;
- Diabetes remains an area of active research interest, with much focus on relationships between insulin resistance and cognitive impairment and dementia, as well as investigation into the possible additive and the role of diabetes as an aggregate factor in metabolic syndrome

#### 5. Obesity

- Abdominal obesity is an independent potent risk factor for ischemic stroke<sup>32</sup> in all ethnic racial groups. It is a stronger risk factor than BMI<sup>33,34</sup>;
- Obesity is a critical cardiovascular risk factor that is strongly correlated with chronic diseases such as type 2 diabetes, hypertension and dyslipidemia, and metabolic syndrome<sup>35</sup>;
- Obesity in middle age increases the risk of future dementia independently of co-morbid conditions<sup>36,37</sup>: Compared to normal weight (BMI 18.6-24.9) persons, overweight (BMI 25-29.9) persons were at 35% greater risk of dementia, and obese persons (BMI>30) have a 74% increased risk of dementia<sup>36</sup>;
- Clustering of vascular risk factors increases the risk in an additive manner: Midlife obesity, high total cholesterol levels and high systolic BP are all significant risk factors for dementia (Odds ratios ~ 2.0 for each factor), and they increase the risk for dementia additively (OR 6.2 combined)<sup>37</sup>;
- Obesity in older age (ages 70-88) is also associated with an increased risk of dementia<sup>38</sup>;

#### 6. Psychosocial Factors

- The relationship between stress and dementia is unclear. There is limited, non-conclusive research into whether or not life event factors, psychosocial stress, and premorbid personality traits such as passivity, avoidance, obsessive features, etc are risk factors associated with dementia<sup>39, 40</sup>.

- There is limited research (level 2 evidence) into the psychosocial stress associated with work environments (i.e., manual labour) and the association with dementia<sup>41,42</sup>;
- A lack of social connectivity is positively associated with dementia. Studies in this genre (level 2 evidence) have looked at psychosocial stress related to living alone, having no social ties, scarcely participating in social and leisure events and never been married<sup>43,44,45</sup>
- Depression often precedes the onset of early dementia<sup>46</sup>;
- Clinical depression, particularly if severe or untreated, impairs thinking processes, clinically appearing as a “dementia”;
- There is a large body of evidence that has concluded there is a causal association between depression, social isolation and lack of quality social support and the causes and prognosis of coronary heart disease<sup>47</sup>

### 7. Lack of fruits and vegetables

- No studies linking dementia and fruit and vegetable intake were located.
- There is an abundance of studies, systemic reviews and meta-analyses examining components of fruit and vegetable intake (such as Vitamins E and C, folate and Vitamin B12 and their association with cognitive impairment and dementia, particularly Alzheimer disease);
- The research outcomes of component nutritional factors such as Vitamin C and E and their association with dementia are mixed. Some research indicates a benefit, some indicate a very small benefit, some say there is no protective effect<sup>48</sup>.
- There is much stronger research evidence linking the lack of fruits and vegetables with cardiovascular disease, particularly for ischemic stroke and coronary heart disease, both pathologies that can lead to dementia<sup>49</sup>.
- Dietary intake of fruits and vegetables at minimum recommended levels of 400 gms per day (optimal is 600 mgm/day, excluding potatoes) provides a protective role against cardiovascular disease by increasing the stability of lipids towards oxidative damage<sup>50</sup>
- Fruit and vegetable intake decreases the level of total cholesterol and LDL-cholesterol<sup>51</sup>
- In a recent meta-analysis<sup>52</sup>, a reduced incidence of major CHD events at high supplemental vitamin C intakes. The risk reductions at high vitamin E or carotenoid intakes appear small.
- Soluble dietary fiber decreases serum total and low-density lipoprotein cholesterol concentrations and improves insulin resistance.
- Elevated plasma total homocysteine concentration, especially associated with folate insufficiency<sup>53,54</sup> is a possible risk factor for cognitive decline and Alzheimer disease.

### 8. Lack of physical exercise<sup>§</sup>:

- compared with no exercise, high levels of activity (exercise engaged 3 or more times per week at an intensity greater than walking) is associated with reduced risks of cognitive impairment, Alzheimer Disease and dementia of any type<sup>55</sup>;
- participation in physical activity at least twice weekly at midlife has a 52% lower odds of dementia compared with sedentary people (no exercise), and a 62% lower odds of developing AD even after full adjustments for age, sex, education, follow-up time, loco-motor disorders, apoE genotype, vascular disorders, smoking and alcohol drinking. The associations are more pronounced in apoE-ε4 carriers<sup>56</sup>.
- the benefits of greater activity results in a 20% lower risk of cognitive impairment and the equivalency to being about 3 years younger in age<sup>57</sup>; This association is not restricted to

<sup>§</sup> For more detailed information on the relationship between physical activity and dementia, see the separate issue of “In Focus!: Physical, Social and Mental Activity and Cognition” located on the IH Intranet site at: <http://insidenet.interiorhealth.ca/NR/rdoonlyres/4BAD12CF-0150-486D-8B48-2261BBF7869A/15804/InFocusPhysicalmentalandsocialleisureactivitiesand.pdf> or contact Elisabeth Antifeau, Clinical Lead for Dementia at 250-354-2883

vigorous activity: walking the equivalent of at least 1.5 hours per week at a 21-30 min/mile pace is also associated with better cognitive performance<sup>57</sup>;

- higher levels of long-term regular physical activity in older people are strongly associated with higher levels of cognitive function and less cognitive decline, therefore regular physical activity represents an important, potent protective factor for cognitive decline and dementia in the elderly<sup>55</sup>

### 9. Level of alcohol consumption\*\*

- Overall, drinking alcohol has a dose-dependent relationship associated with the development of cognitive impairment and dementia<sup>58, 59</sup>
- Light to moderate drinking in middle to late life is associated with better cognitive performance and lesser cognitive decline than no drinking, or heavy drinking<sup>58, 60</sup>
- A small protective advantage<sup>††</sup> for cognition is associated with light to moderate alcohol consumption as compared to complete abstinence and heavier drinking.
- Despite several studies<sup>61</sup>, there is inconclusive evidence that the type of alcohol (red vs. white wine, beer, spirits) makes a difference in protective effect.
- Binge drinking in early and mid-life is associated with dementia in middle age<sup>62</sup>
- The risk of dementia increases with increasing alcohol consumption, particularly for individuals carrying the apolipoprotein  $\epsilon$ -4 allele, a well established gene of susceptibility for dementia. In one study<sup>62</sup>,  $\epsilon$ -4 carriers who drank infrequently were 2.3 times more likely to develop dementia and carriers who drank frequently were 3.6 times more likely. However, the risk of dementia for  $\epsilon$ -4 carriers who never drank was no different from non-carriers that never drank, emphasizing the importance of gene-environment interaction.

### Clustering of Cardiovascular Risk Factors and Dementia

There is a growing body of good quality prospective, longitudinal epidemiological evidence that links cardiovascular risk factors with dementia, not only independently, but in a dose dependent manner. This clustering of these modifiable lifestyle risk factors often first appear in mid-life and their association with dementia in later life makes them a critical target for preventative action. Some of the more compelling epidemiological evidence on the aggregation of midlife cardiovascular risk factors is as follows:

- Midlife obesity, high total cholesterol level, and high systolic blood pressure are all significant risk factors for dementia with Odds Ratios of around 2 for each factor, and they increased the risk additively (OR, 6.2 for the combination<sup>37</sup>;) )
- People with both raised systolic blood pressure and high serum cholesterol concentration in midlife have a significantly higher risk of developing Alzheimer's disease than people with either of the risk factors alone (odds ratio 3.5, 1.6 to 7.9)<sup>63</sup>.
- Four risk factors (diabetes, hypertension, heart disease, and current smoking) were associated with a higher risk of AD ( $p < 0.10$ ) when analyzed individually. The risk of AD increased with the number of risk factors (diabetes + hypertension + heart disease + current smoking). The adjusted hazards ratio of probable AD for the presence of three or more risk factors was 3.4 (95% CI: 1.8, 6.3;  $p$  for trend  $< 0.0001$ ) compared with no risk factors<sup>21</sup>.

\*\* For more detailed information on the relationship between alcohol and dementia, see the separate issue of "In Focus!: Drinking, Thinking and Brain Health" located on the IH Intranet site at: <http://insidenet.interiorhealth.ca/NR/rdonlyres/4BAD12CF-0150-486D-8B48-2261BBF7869A/16644/InfocusDrinkingThinkingandBrainHealth.pdf> or contact Elisabeth Antifeau, Clinical Lead for Dementia at 250-354-2883

†† The Dementia Clinical Practice Working Group **does not** advise the consumption of alcohol for the purposes of preventing cognitive loss or dementia because the safe use of alcohol is extremely complex and variable across populations and for individuals.

### **Section II: Clinical Practice Guidelines to Reduce Cardiovascular and Cerebrovascular Burden**

The assessment and management of cardiovascular risks is mostly led by primary health care physicians. However opportunities for primary prevention can also exist within interdisciplinary practice settings. Therefore, while there will be passing mention and referencing of current medical practice guidelines, the focus of this section will be twofold:

1. identifying an interdisciplinary, absolute risk reduction approach to cardiovascular risk, and
2. focusing on modifiable lifestyle risk factors.

#### **1) The Need for Absolute Risk Reduction that is Interdisciplinary-based :**

##### **a) Current State of Practice:**

There are several studies providing compelling evidence that there is a need for aggressive risk factor assessment and management for clients at high risk for cardiovascular events, and yet the application of risk reduction strategies remains inconsistent and incomplete in many health care practices. For example, only 58% of Canadians are aware of what their blood pressure is, and of those diagnosed with essential hypertension, only 16% have adequate blood pressure control<sup>64, 65</sup>

There is a need to identify high risk populations through the use of an *interdisciplinary* and *systemic* approach if enhanced population outcomes such as reduced cardiovascular morbidity and mortality and associated declines in cognitive impairment and dementias are to be achieved. An **absolute (global) risk reduction model** is recommended to support interdisciplinary practices aimed at risk reduction.

##### **b) The Concept of Absolute Risk Reduction: “Reduce Risks, the Lower the Better”**

“*Absolute risk*” is defined<sup>66</sup> as the probability of a client developing a cardiovascular event over a specified period of time. The presence of multiple risk factors which sustain small or moderate elevations (e.g., rising levels of lipids or diastolic blood pressure or weight gain) confer greater risk of disease over time than an extreme elevation of a single risk factor<sup>66</sup>. Similarly, for any given reduction in a risk factor, regardless of baseline level, the absolute cardiovascular risk will be reduced by a constant proportion. Therefore, rather than manage client care by focusing on single risk factors (i.e., blood pressure) and “normalizing” the level, an absolute risk approach aims to simply **reduce as many risk factors as much as possible**.

The concept of an “absolute risk” approach to cardiovascular prevention requires multi-factorial assessment, and management. Within an interdisciplinary team setting, a multi-pronged approach to care would include:

- I. An accurate and comprehensive assessment of individual risk factors is identified;  
Cardiovascular risk factors, such as hypertension, rarely occur in isolation<sup>74</sup>. A comprehensive assessment of all cardiovascular risk factors (age, sex, history, lipid levels, smoking, diet, activity, diabetes, psychosocial stress, etc) is needed to understand the individual’s global risk.
- II. An individual’s absolute risk (high, medium, low) is determined;  
Risk stratification charts assist professionals to identify and delineate individuals who are at more, some or minimum risk, and are an important first step to planning effective care. Individuals at high risk benefit from more aggressive risk factor management, while those at



low risk benefit from periodic monitoring. However, as cardiovascular risk is a continuum, all individuals with any identifiable cardiovascular risks benefit from a health plan that modifies their risk. There are many risk charts published in current medical guidelines. An example of a risk stratification chart for cardiovascular variables is located in Appendix A.

- III. An effective plan of interdisciplinary care is constructed and monitored over time  
Upon gaining an understanding of the degree of absolute risk, the interdisciplinary team fashions a management plan that actively involves the client and caregiver, and employs multi-level strategies to concomitantly reduce as much risk as possible. Referrals to a dietician for nutritional counseling, physiotherapy for functional assessments, mobility, falls risk and activity planning, or to social work for psychosocial support and counseling to support behavioural changes are some of the ways in which interdisciplinary teams can better provide risk reduction and management supports.

### **2) Modifiable Life-style Risk Factors**

An exhaustive literature review resulted in very few primary prevention guidelines that specifically address cardiovascular and cerebro-vascular burden and the risk of developing dementia. There are however, a great many health promotion and disease prevention guidelines which address specific risk factors for cardiovascular and cerebro-vascular disease. Given the strong association between these risk factors and cognitive impairment and/or dementia as described in Section 1 of this module, the Interior Health Dementia Clinical Practice Working Group advises that “Heart Smart” treatment strategies and lifestyle practices that reduce risk for cardiac and cerebro-vascular disease are also “Brain Smart”.

While many of these detailed guidelines are intended for physician practice, they contain clinical knowledge and important messaging for all professional disciplines, necessary to understand the aim and details of intervention and care management. A brief synopsis of each recommendation is described below. The reader is encouraged to review the original details contained within the fully referenced recommended guidelines as much as possible.

**Clinical Practice Recommendations**,<sup>‡‡, §§</sup> address the following *eight modifiable lifestyle risk factors*:

1. **Smoking**
2. **Diet**
3. **Blood Pressure**
4. **Diabetes**
5. **Excess Weight**
6. **Sedentary Lifestyle**
7. **Stress**
8. **Alcohol Consumption**



**Strength of Recommendations Taxonomy**<sup>‡‡, §§</sup>:

Evidence-based Recommendations are rated as follows:

- A** = consistent and good quality client-oriented evidence;
- B** = inconsistent or limited-quality client-oriented evidence;
- C** = evidence lacking, more research needed; based on expert consensus/usual practice

### **I. Smoking Cessation to Reduce Cardiovascular Risk:**

Clinical practice guidelines are available in a separate issue of “In Focus: Smoking and Brain Health”. Readers are referred to the complete issue available at the following IntraNet link:

<http://insidenet.interiorhealth.ca/Health+Delivery/Home+Community/Planning+Development/Dementia+Care+Strategy/>.

#### **1. Education/Training:**

- Educate frontline staff about the health determinants of tobacco use; **(B)**
- Educate frontline staff about using a “Readiness to Change<sup>\*\*\*</sup>” approach to assessing client smoking behaviours; **(B)**
- Educate frontline staff about tobacco cessation strategies, resources and client supports. **(A)**
- Educate physicians and dentists regarding current research and guidelines on tobacco cessation strategies, including effective brief counselling techniques **(B)**

#### **2. Information:**

- Current tobacco cessation programs in IHA need to be made aware of the level of evidence currently available concerning smoking and dementia. **(C)**
- Primary and secondary intervention strategies are important across the life-course. The “teachable moment” in secondary interventions may be equally or more effective in changing behaviour than primary prevention strategies. **(A)**

<sup>‡‡</sup> Ebell MH, Siwek J, Weiss BD, Woolf SH, Susman J, Ewigman B, & Bowman M. Simplifying the language of evidence to improve patient care: Strength of Recommendation Taxonomy (SORT): A patient-centered approach to grading evidence in the medical literature. *The Journal of Family Practice* 2004;53(2):111-120, available in the public domain from <http://www.aafp.org/afp/20040201/548.pdf>

<sup>§§</sup> The SORT research grading tool emphasizes patient-oriented outcomes – outcomes that matter to patients and help them live longer or better lives, including reduced morbidity, mortality or symptoms, improved quality of life and lower cost of health care services. Levels of evidence are ranked 1-3 based on the validity (quality) of the study design. Strengths of recommendations (A to C) are based on grading the quantity and consistency of the studies and their findings. Ratings are listed following each recommendation or group of recommendations as needed.

<sup>\*\*\*</sup> “Readiness to change” involves several stages, including pre-contemplation, contemplation, preparation, action, maintenance, & relapse. Different stages of readiness require varying strategies of intervention and support.

### 3. Program Planning:

- A life-course approach should be used to identify target populations for smoking cessation programs; (e.g., there is evidence of a mid-life window of opportunity) **(C)**
- Smoking cessation programs reflect evidence-based multi-stage support strategies. **(B)**
- Strategies to target the smoking gradient for vulnerable clients (i.e., lower SES across the life-course, elderly, pregnant women) need to be evident in smoking cessation programs **(A)**
- The development of tobacco cessation strategies for population-specific groups (e.g., mid-life population) needs to use current evidence-based sociological knowledge about locus of control for client health beliefs, future salience and health consciousness in order to develop and target meaningful and effective intervention strategies. **(A)**
- Resources are available to integrate tobacco cessation knowledge and messaging into everyday clinical practice for *all* frontline health professionals. **(A)**
- Poverty is a significant health determinant in the smoking gradient. Access to funded Nicotine Replacement Therapy options for low-income clients is recommended. **(C)**

### 4. Provision of Care:

- Encourage integration tobacco cessation knowledge and messaging into everyday clinical practice for all health professionals. **(A)**
- All health encounters need to include screening to identify and document client tobacco use status; **(A)**
- If smoking is identified, the client should be assessed as to readiness to change and receive appropriate stop smoking and referral information; **(A)**
- Health care staff are encouraged to use the knowledge that older people with lengthy smoking histories are likely to need additional or tailored assistance with cessation into their care plans. **(B)**
- For professional health staff (i.e., mental health, physicians, primary care clinicians) who are involved in counselling and patient education, tobacco cessation strategies need to include, but not be limited to:
  - “5-A” behavioural counselling framework (ask, advise, assess, assist and arrange); **(A)**
  - “5-R” framework to treat tobacco use (relevance, risk, rewards, road-blocks, repetition)’ **(A)**
  - Quit smoking telephone support lines; **(B)**
  - Tailored counselling and education for vulnerable clients, e.g., pregnancy, older adults. **(A)**
  - access to current and accurate self-help materials specific for this health authority are made available on-line and in prominent health resource centers; **(C)**
  - self-help material is not a stand alone strategy (has minimal effect), but part of a comprehensive, multi-strategic approach to cessation counselling; **(A)**
- Access to pharmacotherapy options, including:
  - nicotine replacement therapy (NRT), e.g., gum, patch, nasal spray); **(A)**
  - sustained-release bupropion; **(A)**

### 2. Diet Modifications to Reduce Cardiovascular Risks:

Upon reviewing several bodies of research and practice guidelines<sup>67,68,69,70</sup> the Dementia Clinical Practice Working Group advises the key components of a healthy diet includes the following guidelines concerning **diet modifications to reduce the cardiovascular risks:**

#### 1. Education/Training:

- Educate front-line professional staff about the relationship between cardiovascular risks and dementia risks; **(B)**
- Educate front-line professional staff about optimal diet modifications to reduce cardiovascular risk. **(C)**

#### 2. Information:

- Provide public information that heart smart interventions are also smart for brain health. **(B)**

#### 3. Program Planning:

- Incorporate brain health rationale into nutritional programs that address cardiovascular risk. **(C)**
- Poverty is a significant determinant of cardiovascular risk in the nutritional gradients for health. Continue Health Authority policy and program endeavours to end hunger, malnutrition, and inequitable access to affordable, nutritious foods for all members of society. **(C)**
- Advocacy for making the healthy nutritional choice, the easy choice. **(C)**
- Advocacy for altering the nutritional choices within vending machines, especially attached to schools, recreational centers, etc. **(B)**

#### 4. Provision of Care:

- Reduce and replace total, saturated and trans fats with proportional increases in monosaturated , n-3 (omega 3), and n-6 (omega-6) fatty acids **(A):**  
Key Points to Consider:
  - *The quality and type of fat consumption in a diet is important.*
  - *Diets high in saturated fatty acids and trans fatty acids significantly increase LDL cholesterol levels and the risk for heart disease;*
  - *The current focus in popular culture towards low-fat diets (both in absolute terms and as a percentage of dietary intake) does not necessarily improve lipid profiles or reduce risk of cardiovascular disease<sup>67</sup>;*
  - *Diets that substitute carbohydrates (particularly high glycemic carbohydrates) for fat do not alter the LDL:HDL ratios (they decrease similarly); rather, they increase triglycerides and can induce dyslipidemia<sup>68</sup>;*
  - *A recent Cochrane<sup>69</sup> review concluded: “There is a growing body of evidence from biological, observational and epidemiological studies that suggests a protective effect of omega 3 PUFA against dementia. However, until data from randomized trials become*

available for analysis, there is no good evidence to support the use of dietary or supplemental omega 3 PUFA for the prevention of cognitive impairment or dementia”.

- **Increased dietary fiber, fruit, and vegetables<sup>49,50,51</sup> in an effort to:**
  - Reduce caloric intake; **(B)**
  - increase micronutrients<sup>†††</sup> (eg, folate, B(6), B(12) to lower serum homocysteine levels<sup>70</sup>); **(B)**
  - increase plant protein in lieu of animal protein; **(B)**
  - reduce portions of highly processed, salted and preserved foods. **(B)**
- **Encourage, support, and reinforce dietary teachings to clients:**
  - medically advised diets (e.g., DASH for hypertension, diabetic diet, etc) **(B)**
  - lifestyle behaviours that support healthy nutritional choices (e.g., advance planning for meals, snacks, use of food groups, shopping guides, etc.) **(C)**

### **3. Optimal Blood Pressure Control to Reduce Cardiovascular Risk:**

Hypertension remains one of the most significant public health issues in Canada. Approximately 46% of Canadians aged 55-65 have hypertension, yet only 58% of the public is vaguely aware of what their blood pressure is<sup>Error! Bookmark not defined.</sup>. It is expected that the vast majority of Canadians will develop hypertension at some point in their lifetime. Hypertension is a common cause of death and disability and can be prevented and effectively treated by combining changes in lifestyle and drug therapy.

Multiple Canadian guidelines<sup>71, 72, 73, 74, 75</sup> exist regarding the screening, identification, diagnosis and management of hypertension. Upon review, and in keeping with the BC and Canadian health care system, the Dementia Clinical Practice Working Group advises the following practice recommendations<sup>†††</sup> concerning **blood pressure control and reduction of cardiovascular risk:**

#### **1. Education/Training:**

- Educate health professionals who take client blood pressures to be knowledgeable of blood pressure treatment targets, blood pressure emergencies and treatment; **(A)**
- Educate health professionals to develop an index of suspicion for hypertension in individuals with a history of other cardiovascular risk factors (smoking, diet, weight, activity, etc), or a medical history of known cardiovascular target organ damage; **(A)**
- Educate health professionals about the importance of screening and detection of BP during health related visits; **(A)**
- Educate health professionals about effective means to discuss primary and secondary preventative strategies using lifestyle modifications as client teaching strategy. **(B)**

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<sup>†††</sup> “High blood levels of homocysteine have been linked with the risk of arterial disease, dementia and Alzheimer’s disease. Current research is investigating whether dietary supplements of folic acid can improve cognitive function for people at risk of cognitive decline by altering homocysteine metabolism. Vitamin B12 deficiency produces an anaemia identical to that of folate deficiency but also causes irreversible damage to the central and peripheral nervous systems. Vitamin B12 deficiency is one of the reversible causes of dementia if caught early, therefore it is critical to have B12 levels assessed and monitored. **There is a risk that if folic acid is given to people who have undiagnosed deficiency of vitamin B12, it may lead to permanent neurological damage.**

<sup>†††</sup> Guidelines are adapted for interdisciplinary practice from the BCMA, RNAO and Canadian Hypertension Education Program (CHEP) recommendations

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### 2. Information:

- Provide public information about the importance of routine blood pressure checks, cardiovascular risk factors and lifestyle modifications needed to reduce blood pressure; **(B)**
- Provide public information about the importance of active involvement in own care in partnership with health professionals to reduce blood pressure related risks. **(B)**

### 3. Program Planning:

- Incorporate long-term brain health as a rationale for reducing cardiovascular risks.**(A)**
- Explore methods to continue actively partnering with the Heart and Stroke Foundation in primary and secondary prevention efforts.**(C)**

### 4. Provision of Care:

#### a) Early Detection and Referral for Diagnosis:

- Assess blood pressure in all adults at all appropriate visits **(A)**;
- Use the correct technique, appropriate cuff size and properly maintained/calibrated equipment (see clinical toolkit at modules end for reference materials on proper technique) **(A)**;
- Health professionals who take client blood pressures should be knowledgeable of blood pressure treatment targets **(A)**:

#### **Blood Pressure Treatment Targets:**

<140/90	Desired target – no comorbid conditions
<130/80	Diabetes, renal disease or target organ damage
<125/75	Proteinuria with diabetes or renal disease
< 160 systolic	Minimum target for isolated systolic hypertension

*source: BCMA Guidelines & Protocols, Hypertension Part 1, 2003*

- Develop an index of suspicion for hypertension in individuals with a history of other cardiovascular risk factors (smoking, diet, weight, activity, etc), or a medical history of known cardiovascular target organ damage<sup>§§§</sup>; **(A)**
- Detection of hypertension (systolic >140, diastolic >90) by health professionals in any care setting in known or new clients requires prompt referral to physician for further assessment and follow-up monitoring **(A)**;
- Health professionals who take client blood pressures should be knowledgeable about blood pressure emergencies (systolic >200; diastolic > 130), and immediately undertake appropriate referral measures for emergency care **(A)**;
- Screening and detection visits are important opportunities to discuss primary and secondary preventative strategies using lifestyle modifications **(B)**

#### b) Assessment and Development of an Interdisciplinary Treatment Plan:

- Assessment of client knowledge and provision of adequate explanation and support concerning :
  - diagnosis of hypertension **(A)**;
  - primary self-management responsibilities **(B)**;
  - the importance of achieving and maintaining target blood pressure goals set by physician **(B)**;
  - use of self/home blood pressure monitoring techniques and appropriate equipment **(B)**;
  - identification of lifestyle factors that may influence management (see below);

<sup>§§§</sup> Target organ damage includes: arteriosclerotic heart disease (ASHD), left ventricular hypertrophy (LVH), congestive heart failure (CHF), transient ischemic attack (TIA), cerebrovascular accident (CVA), nephropathy, peripheral vascular disease and retinopathy (*source: BCMA guidelines, part 1*)

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- setting of collaborative health practices goals, including prevention of secondary complications **(B)**;
- Assess and management of global cardiovascular risks:
  - awareness and understanding of absolute risk approach for cardiovascular disease: **reduce as many risk factors as much as possible (C)**.
  - thoroughly assess and identify individual CV risk factors **(C)**;
  - secure adequate client education and supports through appropriate referral (i.e., pharmacist, diabetic counselor, physiotherapist, social worker, etc) **(B)**
- Assessment of client knowledge and provision of adequate explanation and counseling support concerning **lifestyle modifications aimed at reducing blood pressure** on every visit : (refer to various interdisciplinary health team members as needed) for:
  - Diet - (e.g., DASH – Dietary Approaches to Stop Hypertension) **(A)**
  - Weight control **(A)**
  - Smoking cessation **(A)**
  - Alcohol use reduction;**(B)**
  - Activity/exercise levels;**(A)**
  - Stress management **(B)**
- Medication management:
  - Assess medication history, including prescribed, over-the-counter, herbal and illicit drug use **(B)**;
  - Be knowledgeable about the classes of medications that may be used for clients with hypertension ((diuretics, beta blockers, ACE inhibitor or ARB, calcium channel blockers) **(C)**
  - client education re: medication management strategies to improve adherence including:
    - emphasis on the importance of taking medications at the same time everyday **(C)**;
    - simplify\*\*\*\* medication regimes where possible **(C)**;
    - use of fixed dose<sup>76</sup> combination pills **(B)**;
    - use of unit-of-dose<sup>76</sup> packaging, (e.g., blister packing, dosettes) **(B)**;
  - encourage and support client to be actively involved in his/her treatment **(C)**

#### **4. Optimizing Diabetic Care to Reduce Cardiovascular Risks:**

Upon reviewing several bodies of research and diabetic practice guidelines<sup>26,27,77, 78,80</sup> the Dementia Clinical Practice Working Group advises the following guidelines concerning **the reduction of cardiovascular risks associated with diabetes:**

##### **1. Education/Training**

- Educate health professionals to understand that the reduction of cardiovascular risk through a comprehensive, multi-faceted approach is considered the *first* priority in preventing diabetic complications<sup>Error! Bookmark not defined.</sup> **(A)**.
- Educate health professionals to be knowledgeable about the guidelines for Diabetic Screening and Detection Recommendations (see provision of care); **(C)**

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\*\*\*\* Recent studies suggest that 75% of clients require at least 2 drugs and 25% of clients require at least 3 drugs in order to reduce BP to target levels. Diabetic patients in particular require multi-drug therapy. Discuss options with physician and pharmacist if client is self-administering a complex mix of medications and adherence is a concern.  
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### **2. Information**

- Provide health professionals with the following key information:
  - Individuals with diabetes are at approximately 80% higher risk of dying from coronary, peripheral or cerebrovascular disease than those in the general population<sup>79</sup>. In an attempt to reduce this extraordinarily high risk, all cardiovascular risk factors in all persons with diabetes should be regularly assessed, monitored and treated aggressively<sup>80</sup> **(A)**
  - Research shows that lifestyle interventions that address behaviours such as poor nutrition, sedentary activity, weight gain, and smoking are more effective than metformin in the prevention of diabetes in people at high risk for developing the disease.<sup>81</sup> Lifestyle modification is the cornerstone to effective diabetic management. **(A)**
  - Successful diabetic care requires daily commitment of the person with diabetes to self manage lifestyle choices and medication. **(A)**
  - Effective diabetic care requires interdisciplinary support (family physician, nurse, educators, nutritionist, and specialist access as needed). **(A)**
  - Diabetic teaching is a specialty. Clients should be routinely referred to their closest diabetic health care team for initial and ongoing assessment and monitoring; **(C)**
  - To achieve effective lifestyle/behavioural outcomes, interventions should be based on individual needs, and should be regularly evaluated and reinforced; **(B)**
  - Lifestyle interventions are equally effective in small groups or one-on-one settings.**(B)**
- Continue to promote public diabetes information for both primary and secondary education efforts; **(C)**
- Continue to promote information regarding the Canadian Diabetes Association, community pharmacist diabetes programs, etc as a collaborative care partner. **(C)**

### **3. Program Planning**

- Incorporate brain health as a rationale for reducing cardiovascular risks associated with diabetes into targeted diabetic programs;

### **4. Provision of Care**

#### **a) Screening and Detection Recommendations for front-line health professionals:**

- Be knowledgeable about the global risk factors for type 2 diabetes, and be able to identify and refer high risk individuals to physicians for assessment and follow-up; **(B)**
- All individuals should be evaluated annually for type 2 diabetes risk on the basis of demographic and clinical criteria **(B)**
- Canadian Diabetic Association recommends screening for type 2 diabetes by fasting blood glucose levels should be performed every 3 years in individuals  $\geq 40$  years of age; health professionals can encourage clients to seek preventative medical care **(C)**.
- Use health visits as an opportunity to reinforce “healthy living” messages (diet, exercise, smoking) to reduce the risk of “pre-diabetes” (otherwise healthy people with impaired glucose tolerance picked up in screening) developing into type 2 diabetes; **(B)**
- More frequent and/or earlier testing should be considered in people with additional risk factors for type 2 diabetes **(B)**. Some of the associated cardiovascular risk factors include:



- Known vascular disease
- Hypertension
- Dyslipidemia
- Overweight
- Abdominal obesity
- Presence of complications associated with diabetes

b) Assessment & Interdisciplinary Treatment Plan Recommendations to Prevent CV Risk:

- Most people with type 1 & type 2 diabetes should be considered at high risk for vascular disease **(A)**
- Reducing cardiovascular risks involves the following CDA recommended targets:

Optimizing Blood pressure control <b>(A)</b>	<ul style="list-style-type: none"> <li>▪ &lt;130 systolic and &lt; 80 diastolic (&gt;130/80 is the threshold for treatment)</li> </ul>
Optimizing Glycemic control <b>(A)</b>	<ul style="list-style-type: none"> <li>▪ A1C &lt; 7.0 %</li> <li>▪ FPG/preprandial PG: 4.0-7.0 mmol/L</li> <li>▪ 2 hr postprandial PG: 5.0-10.0 mmol/L</li> </ul>
Optimizing lipid control <b>(A)</b>	<ul style="list-style-type: none"> <li>▪ LDL-C: &lt;2.5 mmol/L and</li> <li>▪ TC:HDL-C: &lt; 4.0</li> <li>▪ while TGs are not an indicated treatment target, the CDA recommends that an optimal triglyceride level is &lt;1.5 mmol/L</li> </ul>
Achieving and maintaining a healthy weight <b>(A)</b>	<ul style="list-style-type: none"> <li>▪ 5-10% of initial body weight;</li> <li>▪ Ideally:               <ul style="list-style-type: none"> <li>○ BMI 18.5-24.9;</li> <li>○ Waist Circumference: Men &lt; 102 cm;</li> <li>○ Waist Circumference: Women &lt; 88 cm</li> </ul> </li> </ul>
Smoking <b>(A)</b>	<ul style="list-style-type: none"> <li>▪ cessation</li> </ul>

- A vascular protection approach involves a combination of 1) lifestyle interventions and 2) pharmacological interventions which includes:

1) Structured lifestyle modification programs<sup>††††</sup> aimed at reducing cardiovascular risks include:

- Healthy eating habits **(A)**:
  - Eat a variety of foods;
  - Emphasize cereals, breads and whole grain products, fruits and vegetables;
  - Choose lower fat dairy products, lean meats and foods prepared with little or no fat;
  - Limit sodium, alcohol and caffeine

- Achieving and maintaining a healthy weight; **(A)**
    - regular physical activity or exercise;
    - calorie reduction
  - Engaging in regular physical activity; **(A)**
    - accumulate at least 150 minutes of moderate intensity aerobic exercise each week, spread out over at least 3 non-consecutive days;
    - resistance exercises 3 times per week.
  - Smoking; **(A)**
    - reduction with a target of cessation.
- 2) Pharmacological Interventions may include<sup>††††</sup>:
- Antiplatelet therapy (e.g. ASA ); **(A)**
  - Statins or fibrate (in conjunction with lifestyle modifications) to reduce dyslipidemia; **(A)**
  - Antihypertensives (*in order*): ACE inhibitor **(A)**, ARB **(A)**, cardioselective beta blocker **(B)**, thiazide-like diuretic **(A)**;

### 5. Encouraging Healthy Weight to Reduce Cardiovascular Risk

Upon reviewing recent research<sup>37, 82</sup> and several guidelines<sup>83, 84</sup>, the Dementia Clinical Practice Working Group advises the following practice recommendations concerning **excess weight and reduction of cardiovascular risk**. The following recommendations are adapted from the 2005 BCMA Guidelines and Protocol Advisory Committee on “*Overweight, obesity and physical activity*”.

#### 1. Education/Training

- Educate frontline health professionals to:
  - be knowledgeable about the health risks related to obesity; **(A)**
  - be aware of target indicators related to adult obesity **(A)**
  - incorporate BMI and waist circumference into an overall CV risk assessment; **(A)**
- Educate health professionals to assess dietary intake and associated variables in a sensitive and caring manner; **(C)**
- Educate health professionals to use a “Readiness to Change” approach to weight assessment and education. **(B)**
- Educate health professionals about healthy lifestyle choices that gradually reduce weight over time **(B)**
- Educate health professionals to be role models for healthy weight. **(C)**

#### 2. Information

- Excess weight and obesity are complex physical, psychological, and social care issues.
- The British Columbia Nutrition Survey<sup>85</sup> indicates that 56% of British Columbians are overweight or obese. Obesity is a major risk factor for hypertension, type 2 diabetes, dyslipidemia and

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<sup>††††</sup> For detailed recommendations regarding lifestyle and pharmacological interventions, the reader is referred to the Canadian Diabetic Association Expert Committee, 2003 Clinical Practice Guidelines for the Prevention and Management of Diabetes in Canada, available online at [www.diabetes.ca/cpg/cpg2003/](http://www.diabetes.ca/cpg/cpg2003/)

cardiovascular disease, all of which are associated with cognitive impairment and dementia in later life.

### 3. Program Planning

- Incorporate brain health and cardiovascular risk rationale into weight-related education (C)

### 4. Provision of Care

- Front-line professional staff are encouraged to:
  1. be knowledgeable about the health risks related to obesity;(A)
  2. be aware of the following target indicators related to adult obesity (A)
  3. incorporate BMI and waist circumference into an overall CV risk assessment; (A)

#### Adult Body Mass Index (BMI) (A)

BMI > 25	overweight
BMI > 27	overweight and increased risk of hypertension, diabetes and CVD
BMI > 30	obese, higher risk of complications

#### Adult Waist Circumference (A)

Increased risk:	Female: > 80 cm	Male > 94 cm
High Risk	Female > 88 cm	Male > 102 cm

- Assess client's usual<sup>+++</sup> dietary quality and dietary habits using the following questions: (B)
  - Do you usually eat breakfast?
  - Do you usually eat 5 or more servings of fruit and vegetables/day?
  - Do you usually choose whole grain products?
  - Do you usually choose low fat or reduced fat alternatives at home and when eating out?
  - How many boxes, cups or cans of fruit juice or pop do you usually drink per day?
  - What do you drink when you are thirsty?
- Assess factors that may influence weight, activity and risk levels: (A)
  - Ask about family history of overweight, diabetes, high cholesterol, heart disease, hypertension and kidney disease;
  - Ask about associated conditions (e.g., hypertension, type 2 diabetes, arthritis, depression)
  - Assess client's social conditions (e.g., poverty, unemployment/employment issues, education level, workplace and home stressors, current or previous abuse)
- Measure and document health indicators that include height, weight, body-mass index (BMI), waist circumference, physical activity level and diet description during routine health assessments, as appropriate. Assess for changes in these indicators overtime, particularly rapid changes.(A)
- Assess readiness to change<sup>\$\$\$\$</sup>: (B)
  - Are you considering trying to lose weight or increase activity?
  - Are you currently trying to lose weight or increase activity?
  - Would you like some information to help you?
- Help the client who indicates they are ready to make changes to set realistic behavioural goals: (A)

<sup>+++</sup> "usually" means 5 or more days per week, most weeks.

<sup>\$\$\$\$</sup> An excellent overview to the stages of change and appropriate dialogue is outlined in Appendix 2 of the BCMA Guidelines for Overweight, obesity and physical inactivity.

- emphasize gradual change in lifestyle over time;
  - recommend increased physical activity (e.g., walking 30 minutes every day);
  - recommend some level of calorie restriction;
  - provide self-help materials (see clinical toolkit at modules end);
  - provide positive messaging that even modest losses of weight and increases in activity will result in significant health benefits. Be positive, supportive and encouraging.
- Refer client for further assessment (physician), or to related health programs of professional care (dietician, physiotherapist, social worker) if client is ready to make change and such programs are available, accessible and appropriate; **(C)**

### **6. Encouraging Active Lifestyle to Reduce Cardiovascular Risk:**

Upon **review of several international physical activity guidelines**<sup>86,87,88,89</sup>, and understanding that access to the general population, especially well seniors, involves episodic health care and teachable moments, the Dementia Clinical Working Group recommends that health professionals provide the following assessment, education and support strategies for clients to promote healthy choices that involve physical activity.

#### **1. Education/Training**

- Educate health professionals that sedentary lifestyles are an independent risk factor for all-cause and chronic health disease mortality<sup>90</sup>. **(A)**
- Educate health professionals about the importance of promoting an increase in physical activity (frequency, duration and intensity) for the purposes of preventing, or reducing cardiovascular risk factors (hypertension, diabetes, hyperlipidemia), the risk of stroke and to foster a sense of well-being and healthy aging. **(A)**
- Educate health professionals to provide assessment, education and support strategies for clients during routine visits in an effort to promote healthy choices that involve physical activity **(C)**

#### **2. Information**

- The regular practice of physical activity is an independent protective factor for brain health<sup>55,56</sup> and associated with a reduction in morbidity and mortality across the life-course<sup>91,92</sup>. **(A)**
- An active lifestyle is beneficial across the entire life course from childhood through youth, midlife and into advanced age.**(A)**

#### **3. Program Planning**

- Incorporate brain health rationale into activity programs that target reducing cardiovascular risk **(C)**
- Regular physical activity targeted for the elderly is often viewed as challenging, yet there is research support that shows that programs which provide light to moderate intensity activity can be effectively promoted to seniors in the 65-90 years age category<sup>93</sup>. **(B)**

#### **4. Provision of Care**

- An individualized counseling approach is more useful than general messaging<sup>94,95</sup>. **(A)**
- Evaluate:
  - current physical activity level; **(C)**

- readiness to make changes<sup>\*\*\*\*\*</sup>; **(B)**
- client goals; **(C)**
- ability to balance; **(A)**
- history of recent falls; **(A)**
- client fears of negative effects (muscle soreness, fear of falling, fatigue, dyspnea, etc). **(C)**
- An individualized plan of graduated activity increase is more successful than general information about the benefits of physical activity<sup>96</sup>. **(A)**
- A minimum of 30 minutes of moderate intensity activity<sup>†††††</sup> at least 3-4 days per week, but preferably on most days is most beneficial in reducing cardiovascular risks; **(A)**
  1. The 30-minute activity can also consist of shorter exercise bouts (minimum of 10 minutes) that are accumulated throughout the day; **(B)**
  2. Health practitioners should develop a current knowledge of, and promote the use of, local community resources and safe opportunities for senior's physical activity that include compensation for seasonal weather, and the demands of geographical terrain<sup>96</sup>; **(C)**
  3. Health practitioners are encouraged to personally role-model heart-healthy lifestyles<sup>97</sup> **(B)**
  4. Clients should be advised to speak with the physician first if there are any known cardiac risk factors or other chronic diseases. Physical activity recommendations may be altered for individual variances. For example, with established hypertension, physical activity recommendations should be in accordance with the Canadian guidelines<sup>98</sup> to prevent and control hypertension. **(A)**

### **7. Managing Stress to Reduce Cardiovascular Risk**

Upon reviewing current research and reviews<sup>99,100, 101, 102</sup> and limited psychosocial guidelines regarding treatment options, the Dementia Clinical Practice working group advises that:

#### **1. Education/Training**

- Provide education for health professionals about the strong and consistent evidence of an independent causal association between *depression, social isolation* and *lack of quality social support* and the causes and prognosis of coronary heart disease<sup>103</sup>; **(A)**
- Provide education for health professionals about assessment of psychosocial risk factors, the importance of accurate and early referral, and the skills and knowledge needed to provide effective psychosocial care in any health setting. **(C)**

#### **2. Information**

- There is a growing body of evidence that links 3 psychosocial domains with increased risk of cardiovascular disease and cardiovascular morbidity and mortality<sup>104</sup>: **(B)**
  - Negative emotional states, including depression, anger, hostility and anxiety;
  - Chronic and Acute psychosocial stressors;
  - Social ties, social support, and social conflict

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<sup>\*\*\*\*\*</sup> "Readiness to change" involves several stages, including pre-contemplation, contemplation, preparation, action, maintenance, & relapse. For an excellent overview to strategies which support different stages of readiness, see the University of Iowa Gerontological Nursing Interventions guideline, listed in this reference.

<sup>†††††</sup> Moderate intensity activity is defined as 50-60% maximal oxygen consumption (VO<sub>2</sub>max). In practical terms, this means that the person's heart rate during exercise should be approximately 60-75% of his/her maximum heart rate.

- The increased risk contributed by psychosocial factors such as depression, social isolation, and lack of quality social support is equivalent to more conventional CHD risk factors such as smoking, dyslipidemia and hypertension<sup>103</sup> **(B)**

### **3. Program Planning**

- Incorporate brain health into the rationale for stress and cardiovascular risk reduction program planning. **(C)**

### **4. Provision of Care**

- Assessment of psychosocial risk factors (depression, social isolation and lack of quality social support) be incorporated into routine cardiovascular assessments; **(A)**
- Clients with identifiable psychosocial risk factors and psychological distress be routinely referred for further medical assessment and possible treatment options; **(B)**
- Referral to social workers for expert assessment of psychosocial distress and follow-up counseling and lifestyle behavioral management is preferred practice. **(B)**
- Develop an individualized plan integrating the following interdisciplinary interventions to address psychosocial issues: **(C)**
  - Monitor and promote nutrition, elimination, sleep/rest patterns, and physical comfort (especially pain control);
  - Enhance physical function (i.e., structure regular exercise/activity; refer to physical, occupational, recreational therapies); develop a daily activity schedule.
  - Enhance social support (i.e., identify/mobilize a support person(s) [e.g., family, confidant, friends, hospital resources, support groups, patient visitors]); ascertain need for spiritual support and contact appropriate clergy.
  - Maximize autonomy/personal control/self-efficacy (e.g., include patient in active participation in making daily schedules and setting short-term goals).
  - Identify and reinforce strengths and capabilities.
  - Provide practical assistance; assist with problem-solving if needed.
  - Provide emotional support (i.e., empathic, supportive listening; encourage expression of feelings and hope instillation), and support adaptive coping;
  - Provide information about any physical or mental illness and treatment(s) (e.g., depression (i.e., that depression is common, treatable, and not the person's fault)
  - Educate about the importance of adherence to prescribed treatment regimen (e.g., medications for depression) to prevent recurrence;
  - Ensure community health referrals; consider well seniors, adult day centers, mental health, home care and home support interventions to promote independent living at home.

### **8. Alcohol Consumption and Reducing Cardiovascular Risk:**

The consumption of alcohol and its relationship with vascular risk factors is described as a “J” or “U” shaped association, similar to that discussed in the module “Drinking, Thinking and Brain Health”<sup>####</sup>. There is mixed evidence that individuals who practice abstinence, or who drink more heavily are at greater cardiovascular risk of hypertension, heart disease and dyslipidemia, than individuals who drink light to moderately (hence the J or U).

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<sup>####</sup> See separate issue of “In Focus: Drinking, Thinking and Brain Health”. Readers are referred to the complete issue available at the following IntraNet link: <http://insidenet.interiorhealth.ca/Health+Delivery/Home+Community/Planning+Development/Dementia+Care+Strategy/>  
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# **In Focus!** *Towards Clinical Excellence: Evidence-Informed Practice Recommendations for Dementia Care*

The protective effects appear to result from an inhibitory effect of alcohol on platelet aggregation and a favourable alteration in the serum lipid profile<sup>105, 106</sup> which is believed to reduce vascular risk, particularly in women. The small protective effects associated with alcohol consumption appear to result from the total alcohol consumed, not the type of beverage (wine, beer spirits). The evidence of the relationship between alcohol and cardiovascular risk profiles requires further research.

It is critical to recognize that unhealthy alcohol consumption is a common and serious physical, mental and social concern. Because the safe use of alcohol is extremely complex and variable both across populations and for individuals, the Dementia Clinical Practice Working Group **does not** advise the consumption of alcohol for the purposes of reducing cardiovascular risk.

Upon reviewing several guidelines concerning the use of alcohol, The Dementia Clinical Practice Working Group advises the following clinical practice recommendations concerning **alcohol use and cardiovascular risk**:

## 1. **Education/Training:**

- Educate frontline staff, physicians and other care providers about the spectrum of unhealthy alcohol use and brain health. **(C)**
- Educate physicians and other primary care providers to a client-centered harm reduction (or complete abstinence) approach to alcohol-related care management that includes screening, assessment, and brief intervention advise or motivational interviewing techniques **(C)**
- Educate all frontline professional staff regarding the risk spectrum of alcohol use, the incidence and prevalence of alcohol use, basic screening and referral for brief intervention approaches. **(B)**
- Educate health professionals about the special risks of alcohol use amongst elderly clients even at low-level consumption. (e.g., medication and alcohol interactions, falls, social support and mental health needs, etc.) **(B)**
- Educate health professionals that the safe use of alcohol is extremely complex and variable both across populations and for individuals and the consumption of alcohol for the purposes of reducing cardiovascular risk is **NOT** advised. **(C)**
- Educate health professionals about Canada's Low Risk Drinking Guidelines; **(A)**

## 2. **Information:**

- Provide the information and level of evidence between alcohol, cognition and dementia to IH Mental Health and Addictions staff and managers; **(C)**
- Provide positive individual health messaging that improved cognitive health is better gained through positive stress management (preventing alcohol misuse as a coping strategy), a healthier diet, increasing exercise, and stopping smoking, rather than starting to drink or drinking more. **(C)**
- Provide public information that the evidence of the relationship between alcohol and cardiovascular risk profiles requires further research.**(C)**
- Provide public information that unhealthy alcohol consumption is a common and serious physical, mental and social concern; **(C)**
- Provide public information that the safe use of alcohol is extremely complex and variable. The consumption of alcohol for the purposes of reducing cardiovascular risk is not advised. Individuals should seek medical advice for personal situations and individual risk factor determination. **(C)**

### **3. Program Planning:**

- Incorporate alcohol and brain health evidence into planning and design of alcohol reduction programs and services **(A)**
- Commit to planning, funding and allocating resources and staff to identify and intervene in risky/harmful alcohol use by clients of all ages **(B)**
- Integrate specific information regarding seniors and alcohol use into program planning and designs. This is a special target population with unique needs.**(B)**
- Specifically target binge drinking across the life-course, e.g., mid-life, not just adolescence. **(A)**

### **4. Provision of Care:**

- Implement screening and brief intervention for hazardous/risky/harmful alcohol use as part of routine practice. **(A)**
- All IH front line staff implement basic 3 step screening protocol and procedures to assess alcohol use as follows:
  1. Identify clients who drink alcohol from those that do not; **(A)**
  2. Among clients who are identified as alcohol drinkers, inquire about:
    - a. their usual quantity and frequency of drinking; **(A)**
    - b. maximum drinks per occasion in the past month; **(A)**
    - c. Utilize a validated screening instrument to assess for unhealthy alcohol use. **(A)**
    - d. It is suggested that tools such as CAGE (for alcohol disorders) and AUDIT screening instruments (to assess for the full range of at-risk to alcohol dependency drinking) could be used in routine screening. **(B)**
    - e. A specialized tool (e.g., The ARPS (Alcohol Related Problem Survey<sup>107</sup>) is recommended for older client populations to detect hazardous alcohol risk related to interaction with medications, aging physiology, etc., even at low consumption levels. **(B)**
  3. Complete (or refer) for a further in-depth assessment that includes specific alcohol problems and dependence. **(A)**
- Target binge drinking at all ages: screening and repeated short intervention. **(A)**



### Clinical ToolKit for Reducing Cardiovascular Risk

#### 1) Smoking:

- Integrating smoking cessation into everyday health care practice:  
[http://www.rnao.org/bestpractices/PDF/BPG\\_smoking\\_cessation.pdf](http://www.rnao.org/bestpractices/PDF/BPG_smoking_cessation.pdf)

#### 2) Diet:

- Dietitians of Canada: Helpful site with lots of healthy nutrition tips, tools and patient teaching materials: <http://www.dietitians.ca/>
- Heart and Stroke Foundation of Canada, diet recommendations:  
<http://www2.heartandstroke.ca/Page.asp?PageID=38&SubCategoryID=128&Src=living&Type=Article>

#### 3) Hypertension:

- Canadian Guidelines for the management of hypertension:  
[http://www.hypertension.ca/Documentation/Recommandation05\\_va.pdf](http://www.hypertension.ca/Documentation/Recommandation05_va.pdf)
- Soundbite version:  
[http://www.hypertension.ca/CHEP2006/CHEP\\_soundbit.pdf](http://www.hypertension.ca/CHEP2006/CHEP_soundbit.pdf)
- Lecture notes for public education:  
<http://www.hypertension.ca/Documentation/publiceducationLectureNotes.pdf>
- Power point presentation for general public:  
[http://www.hypertension.ca/diaporama\\_va.html](http://www.hypertension.ca/diaporama_va.html) or
- Slide show for improving the quality of blood pressure measurement:  
[http://www.hypertension.ca/CHEP2006/CHEP\\_2006\\_BP\\_Measure.ppt](http://www.hypertension.ca/CHEP2006/CHEP_2006_BP_Measure.ppt)

#### 4) Diabetes:

- An excellent site for health care professionals, full of accurate and timely practice research, education and clinical publications, including client education tools.  
[http://www.diabetes.ca/Section\\_Professionals/nq\\_index.asp](http://www.diabetes.ca/Section_Professionals/nq_index.asp)
- Full Canadian Diabetic Association guideline library dedicated to diabetes.  
<http://www.diabetes.ca/cpq2003/download.aspx>
- BCMA Patient Teaching Guide:  
[http://www.healthservices.gov.bc.ca/msp/protoquides/gps/diabetes\\_care\\_pq.pdf](http://www.healthservices.gov.bc.ca/msp/protoquides/gps/diabetes_care_pq.pdf)

#### 5) Weight Control

- Health Canada's website on the Canadian Guidelines for Body Weight Classification (Quick reference Tool for health professionals)  
[http://www.hc-sc.gc.ca/fn-an/alt\\_formats/hpfb-dgpsa/pdf/nutrition/cg\\_quick\\_ref-ldc\\_rapide\\_ref\\_e.pdf](http://www.hc-sc.gc.ca/fn-an/alt_formats/hpfb-dgpsa/pdf/nutrition/cg_quick_ref-ldc_rapide_ref_e.pdf)

### 6) Sedentary Lifestyle

- **Canada's Physical Activity Guide for Older Adults:** [www.paguide.com/older](http://www.paguide.com/older)  
Explains why physical activity is important for seniors. It offers tips and easy ways to increase level of activity, improve health and prevent and manage chronic diseases.
- **Active Living coalitions for Older Adults (ALCOA)** website: [www.alcoa.ca](http://www.alcoa.ca)  
Information to help older Canadians to maintain and enhance their well-being and independence through a lifestyle that embraces daily physical activity
- **Canadian Health Network:** website: [www.canadian-health-network.ca/](http://www.canadian-health-network.ca/)  
The Canadian Health Network is a national, non-profit bilingual web-based health information service. It helps Canadians find the information they are looking for on staying healthy and preventing injury and disease. Health info for every body.
- **Canadian Physiotherapy Association:** website: [www.physiotherapy.ca/pdfs/FallsSeniors.pdf](http://www.physiotherapy.ca/pdfs/FallsSeniors.pdf)  
Provides useful information on preventing falls

### 7) Stress

- **Canadian Mental Health Association, "Stress Stoppers"** Patient information page on recognizing stress and finding the right resource, from self-help to professional consultation: [http://www.cmha.ca/english/coping\\_with\\_stress/stress\\_stoppers.htm](http://www.cmha.ca/english/coping_with_stress/stress_stoppers.htm)
- Heart and Stroke Foundation of Canada: patient teaching resources re: stress <http://ww2.heartandstroke.ca/Page.asp?PageID=33&ArticleID=484&Src=living&From=SubCategory>

### 8) Alcohol

- National Institute on Alcohol Abuse and Alcoholism: <http://pubs.niaaa.nih.gov/publications/Practitioner/CliniciansGuide2005/guide.pdf>
- **Canada's Low-Risk Drinking Guidelines.** The Low-Risk Drinking Guidelines were developed by a team of medical and social researchers from the University of Toronto and the Centre for Addiction and Mental Health. They have been endorsed by many Canadian mental health and addictions agencies. Full information can be accessed at: [http://www.camh.net/about\\_addiction\\_mental\\_health/low\\_risk\\_drinking\\_guidelines.html](http://www.camh.net/about_addiction_mental_health/low_risk_drinking_guidelines.html)
- **Canadian Health Network:** A federal website with information for seniors on drinking, medications, and health. Contains multiple safe links for patient teaching. Full information can be accessed at the following link: [http://www.canadian-health-network.ca/servlet/ContentServer?pagename=CHN-RCS/Page/SearchPageTemplate&c=Page&cid=1046357853421&searchStr=seniors%20and%20\(alcohol%20and%20not%20gambling\)&searchType=BOOLEAN&orderBy=ORDER\\_RANK&lang=En&reportGroupTopic=Seniors+QS&repType=seniors%20and%20\(alcohol%20and%20not%20gambling\)](http://www.canadian-health-network.ca/servlet/ContentServer?pagename=CHN-RCS/Page/SearchPageTemplate&c=Page&cid=1046357853421&searchStr=seniors%20and%20(alcohol%20and%20not%20gambling)&searchType=BOOLEAN&orderBy=ORDER_RANK&lang=En&reportGroupTopic=Seniors+QS&repType=seniors%20and%20(alcohol%20and%20not%20gambling))

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