

# GUIDELINES & PROTOCOLS

## ADVISORY COMMITTEE

### Cardiovascular Disease – Primary Prevention

Effective Date: March 15, 2008

#### Scope

This guideline describes: (1) the prevention of heart disease, stroke, peripheral vascular disease, congestive heart failure and kidney disease in adults with no known cardiovascular disease (CVD) and (2) the management of elevated cholesterol. For the purpose of this guideline, coronary heart disease (CHD) risk is used as a proxy for CVD risk.

Diagnostic codes: 401 (hypertension); 250 (diabetes); 585 (chronic kidney disease); 272 (disorders of lipid metabolism)

#### Objectives & Strategies

##### Objectives

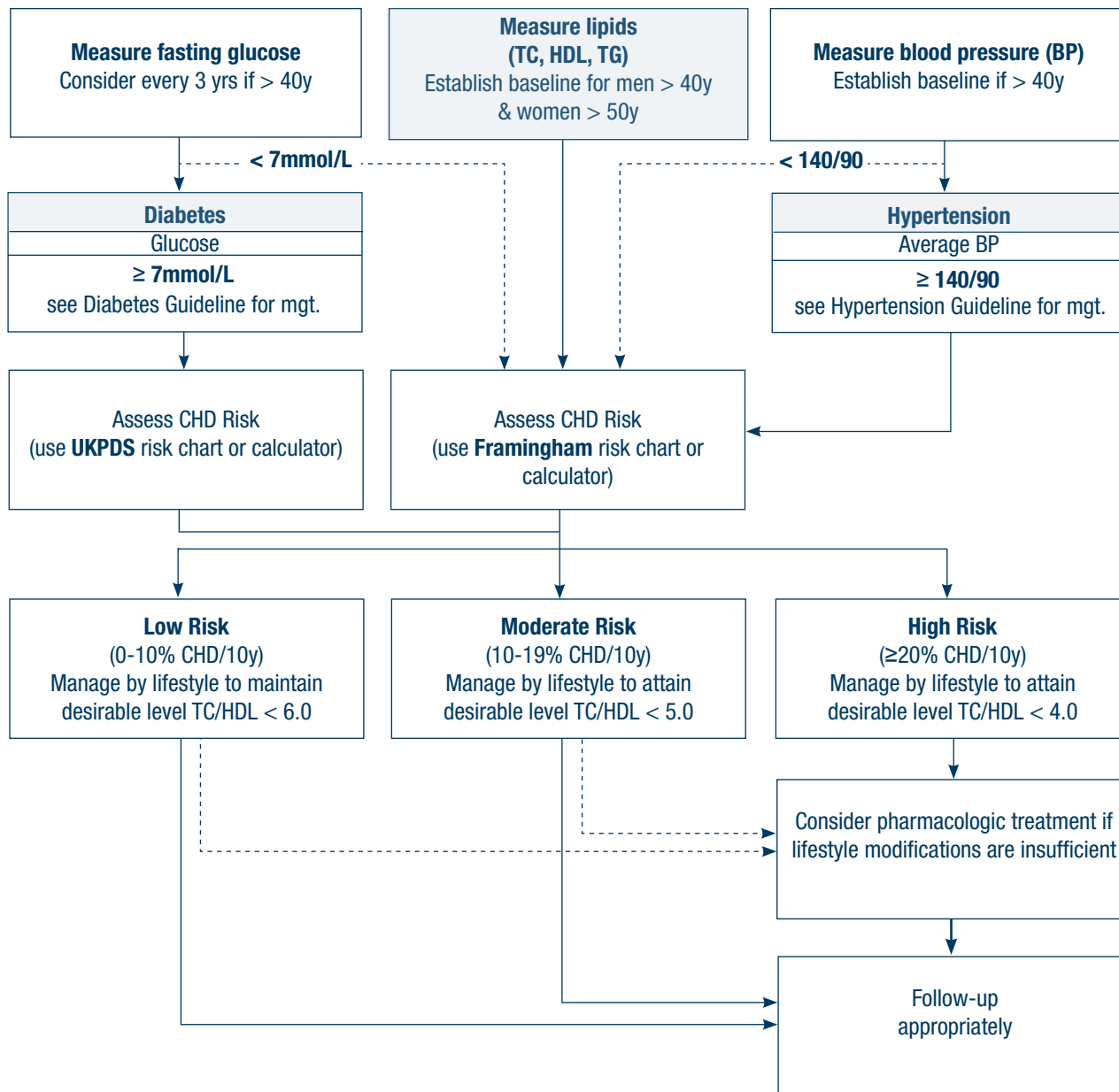
- i. Reduce the risk of clinical CVD (heart attack, stroke, peripheral vascular disease, heart failure and kidney disease) by providing a summary of strategies for the assessment and mitigation of factors that increase the risk of cardiovascular disease; and
- ii. Integrate these strategies with the existing GPAC guidelines for *Hypertension, Diabetes, Chronic Kidney Disease and Overweight, Obesity and Physical Inactivity*.

##### Strategies \*

- i. Prevent heart disease through lifestyle management, including smoking cessation (Appendix A), increased physical activity, maintenance of a healthy weight and healthy eating habits.
- ii. Assess the 10-year CHD risk. This should be a part of a physical examination or done at intervals during other patient-physician interactions. CHD risk assessment charts are provided (Appendix B and C).
- iii. Provide tools for patient self-assessment and access to resources.

\* Figure 1 (following page) provides an overview of risk assessment and management strategies for cardiovascular disease.

**Figure 1. Coronary Heart/Cardiovascular Disease Risk Assessment**



*Abbreviations: BP, blood pressure; CHD, coronary heart disease; HDL, high-density lipoprotein; L, liter; mgt, management; TC, total cholesterol; TG, triglycerides; UKPDS, United Kingdom Prospective Diabetes Study; y, years.*

## Lifestyle Management

Heart disease and stroke are often caused by modifiable risk factors related to diet and lifestyle. These factors include smoking,<sup>1</sup> lack of physical activity,<sup>2</sup> unhealthy eating habits and excess body weight.<sup>3</sup> Excess body weight and lack of physical activity contribute to diabetes, increased blood pressure and dyslipidemia, which in turn significantly increase the risk of heart disease and stroke.

- i. Encourage all patients to adopt a healthy lifestyle to lower their risk of CVD (see the resources section at the end of this guideline and at the end of the associated patient guide).
- ii. Provide adequate explanation and support to patients so that they clearly understand the nature and significance of CVD and that they have the primary responsibility for making the lifestyle changes required for reducing their risk.
- iii. Provide patients with information, tools, resources and available supports, such as those offered by the Heart and Stroke Foundation of British Columbia and Yukon. These resources include self-assessment tools, personalized lifestyle management plans and self-management courses.

### Offer and review the following lifestyle recommendations at each visit:

**Smoking cessation:** Cigarette smoking is responsible for approximately 30% of CHD deaths in North America.<sup>1</sup> Complete cessation of smoking and exposure to second hand smoke is recommended. For assistance to quit, refer patients to QuitNow Services at 1 877 455-2233 (toll-free in BC; available 24/7/365) and at [www.quitnow.ca](http://www.quitnow.ca) to obtain self-help materials. Refer to Appendix A for additional information.

**Physical activity:** A sedentary lifestyle is an important modifiable risk factor. Moderate intensity dynamic activity (such as walking 3 km [2 miles] in 30 minutes once per day or walking 1.5 km [1 mile] in 15 minutes two times per day, jogging, cycling or swimming) is beneficial for cardiac health and has been shown to reduce hypertension, prevent diabetes and improve survival.<sup>3</sup> Writing a prescription for physical activity, such as walking (or another equivalent form of activity) for at least 30-60 minutes per day, 4-7 days per week, is an effective way to promote increased physical activity.

**Weight reduction:** A body-mass index (BMI) greater than 27 kg/m<sup>2</sup> is associated with increased risk of hypertension, type 2 diabetes and dyslipidemia.<sup>2,4-6</sup> Maintenance of a healthy body weight (BMI 18.5-24.9 kg/m<sup>2</sup>; waist circumference [Asian/Caucasian] < 90 cm/102 cm [35"/40"] for men and < 80 cm/88 cm [32"/35"] for women) is recommended. Advise all overweight individuals to lose weight. Weight loss strategies should be long-term and employ a multidisciplinary approach that includes dietary education, increased physical activity and behavioural intervention.

**Dietary recommendations:** Recommend a diet that emphasizes fruits, vegetables, low-fat dairy products, fibre, whole grains, and protein sources that are low in trans-fat, saturated fat and cholesterol.<sup>7,8</sup> In addition to a well-balanced diet, a reduced dietary sodium intake of ≤ 1,500 milligrams per day (approximately 1 tsp of table salt) is recommended for everyone. Advise patients about the “hidden” salt content of processed foods, such as lunchmeat, canned soups and pasta. As well, increased consumption (at least 2 servings per week) of fish that are high in omega-3 fatty acids decreases cardiovascular risk.<sup>8</sup>

Patients with CVD or identified risk factors such as diabetes, dyslipidemia, hypertension or obesity may benefit from personalized diet advice and may benefit from referral to a dietitian (see resources section on page 9 for contact information for Dial-A-Dietitian). Disease-specific patient guides are provided at [www.BCGuidelines.ca](http://www.BCGuidelines.ca).

Additional lifestyle management information, specifically on healthy eating, physical activity and smoking cessation, may be found at [www.actnowbc.ca](http://www.actnowbc.ca). ActNowBC recommends the following:

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<b>0</b>	<b>Smoking: Complete avoidance of tobacco smoke</b>
<b>5</b>	<b>Servings of fruits and vegetables per day (minimum)</b>
<b>30</b>	<b>Minutes of moderate-intensity activity per day (minimum)</b>

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### Cardiovascular Disease Risk Control

A number of clinical conditions, including hypertension, diabetes, dyslipidemia and kidney disease contribute significantly to the risk of developing cardiovascular disease. Effective long-term control of these conditions can substantially decrease the risk of CVD. Individual guidelines for the management of hypertension, diabetes and chronic kidney disease may be found at [www.BCGuidelines.ca](http://www.BCGuidelines.ca). The management of dyslipidemia is covered in this guideline.

The following are considerations for cardiovascular disease risk control. Atherosclerosis and vascular damage that precede clinical CVD can also be prevented by reduction of the risk factors discussed below.<sup>9</sup>

- i. **Blood pressure (BP) control:** Promote a healthy lifestyle through smoking cessation, weight reduction, increased physical activity, low-salt and low-fat food intake (DASH diet), and the use of antihypertensive medications where appropriate, with consideration for the presence of other CVD risk factors.<sup>10</sup>
- ii. **Diabetes management:** Promote a healthy lifestyle through smoking cessation, a healthful diet and increased physical activity, and use medications where appropriate to control blood glucose.<sup>11,12</sup>
- iii. **Measure lipids under the following circumstances:**
  - a. Baseline full lipid profile (TG, TC, HDL, LDL) for men  $\geq 40$  yrs, women  $\geq 50$  yrs and postmenopausal women of any age. Reassess only if major CVD risk factors change.
  - b. Full lipid profile if patient has hypertension, diabetes mellitus (type 1 or 2), chronic kidney disease or abdominal obesity, even if younger than 40 years-of-age.
  - c. Full lipid profile if patient has a family history of premature CHD (onset before age 55 for men, and before age 65 for women), hypercholesterolemia, or signs of hyperlipidemia (for example, tendon xanthoma).
  - d. Consider apolipoprotein B (apoB) for follow-up testing in high-risk patients who are undergoing treatment for hypercholesterolemia (but not for other dyslipidemias). Other lipid tests are not required if using apoB for follow-up. ApoB is a more accurate measurement of atherogenic particles than LDL.<sup>13</sup> Fasting is not required for apoB measurement. See Appendix D for more information.
- iv. **Lipid management:** Recommend lifestyle management (reduced dietary intake of saturated and trans-fats and cholesterol, increased physical activity) as first-line treatment for patients in all risk categories.<sup>14</sup> If lifestyle management is insufficient in achieving desirable lipid levels, consider therapy with lipid-lowering medications, especially for patients at high risk (see Table 1).<sup>14</sup> A decrease of 30-40% in lipids leads to sufficiently reduced CHD risk for most patients, including those with metabolic syndrome and diabetes.
- v. **Global risk assessment:** \*
  - a. Framingham risk chart for patients without diabetes: The Framingham risk assessment chart (Appendix B) is helpful in estimating the 10-year CHD risk for adults who do not have CVD or diabetes. The risk factors included in the Framingham calculation are: gender, age, total cholesterol, HDL cholesterol, systolic blood pressure and cigarette smoking.

- b. UKPDS risk chart for patients with diabetes: The United Kingdom Prospective Diabetes Study<sup>15</sup> (UKPDS) risk assessment chart (Appendix C) is helpful in estimating the 10-year CHD risk for adults with diabetes. The risk factors included in the UKPDS risk assessment are: gender, age, hemoglobin A1c, total cholesterol, HDL cholesterol, systolic blood pressure and cigarette smoking. Refer to the BC diabetes guideline for further information on the UKPDS risk calculator.
- c. The U.S. Preventative Services Task Force (USPSTF) recently reviewed the use of non-traditional risk factors, including high sensitivity C-reactive protein (hs-CRP) and state that the current evidence is insufficient to assess the balance of benefits and harms of using hs-CRP to routinely screen asymptomatic men and women with no history of coronary heart disease in order to prevent coronary events.<sup>33</sup>

\* This excludes high-risk patients with known CVD.

**Table 1. Framingham risk levels and desirable lipid results**

CLASSIFICATION	RISK LEVEL	LDL (mmol/L)	ApoB (g/L)	TC/HDL RATIO
High *	≥ 20% without CHD	< 2.5	< 0.85 for follow-up	< 4.0
Moderate **	10% - 19%	< 3.5	< 1.05	< 5.0
Low ***	< 10%	< 5.0	< 1.25	< 6.0

*Abbreviations: Apo B, apolipoprotein B; CHD, coronary heart disease; LDL, low-density lipoprotein; TC/HDL, total cholesterol/high-density lipoprotein ratio*

- \* Adults with diabetes or chronic renal disease should not automatically be considered high risk. Use the UKPDS risk assessment chart to determine the level of risk for patients with diabetes. Use the Framingham risk assessment charts to determine the level of risk for patients with chronic renal disease.
- \*\* Patients in the moderate risk category may be at high long-term CVD risk. This group includes many patients with abdominal obesity (metabolic syndrome).
- \*\*\* Patients with severe genetic lipoprotein disorders, such as familial hypercholesterolemia or type III dyslipidemia should be treated regardless of their Framingham risk score.

Note: Although triglyceride levels are no longer indicated as a primary treatment target, the optimal level of triglycerides for high-risk patients is < 1.5 mmol /L.

- vi. **Albumin/creatinine ratio:** In most patients with diabetes or hypertension, measurement of the albumin/creatinine ratio is recommended (for details, refer to the BC diabetes and hypertension guidelines). An elevated albumin/creatinine ratio (men: > 2.0 mg/mmol, women: > 2.8 mg/mmol) is associated with an increased risk of heart disease and stroke. Angiotensin converting enzyme inhibitors (ACEI) or angiotensin receptor blockers (ARBs) can be used to manage proteinuria, including microalbuminuria.<sup>16</sup>
- vii. **Kidney function:** Impaired kidney function (eGFR < 60 mL/min) is associated with an increased risk of heart disease and stroke. ACEI and ARBs are effective in improving outcomes related to cardiovascular disease and kidney disease in patients with impaired kidney function.<sup>17,18</sup> The benefits of statin therapy have not been fully evaluated in this patient group.

**Additional considerations**

- i. **Women:** Statins do not appear to prevent heart disease or improve survival for most women without known heart disease (primary prevention), based on a large subset of women (5052) in the North American ALLHAT-LLT trial<sup>19</sup> and a meta-analysis of more than 11,000 women.<sup>20</sup>

- ii. **Older adults:** The PROSPER trial found that statins did not reduce CHD and stroke events in men and women over age 69 without heart disease.<sup>21</sup> There was a significant reduction in cardiovascular events for individuals with coronary heart disease (secondary prevention). Overall (mixed primary and secondary prevention), there was a significant reduction in cardiovascular events, but a corresponding increase in major adverse events, such as cancer and hemorrhagic stroke. There is currently insufficient evidence for the safety of statins and improved overall outcomes in older adults.
- iii. **Aspirin therapy:** Low-dose aspirin (e.g. 81 mg) to prevent platelet aggregation is recommended for people under age 70 who are not aspirin intolerant and who have a ten-year CHD risk  $\geq$  20% (no known CHD).<sup>22</sup> Blood pressure must be well controlled. Low-dose aspirin therapy for patients (men and women) over age 70 is not recommended at this time due to insufficient evidence.<sup>23</sup>
- iv. **Metabolic syndrome:** Metabolic syndrome includes three or more of the following criteria:
  - Abdominal obesity (waist circumference: men  $>$  102 cm, women  $>$  88 cm)
  - Triglycerides  $\geq$  1.7 mmol/L
  - HDL (men  $<$  1.0 mmol/L, women  $<$  1.3 mmol/L)
  - BP  $>$  130/85 mm Hg
  - Fasting glucose 5.7-6.9 mmol/L

The American Heart Association recommends lifestyle intervention as first-line therapy for the management of metabolic syndrome as there is insufficient evidence to recommend the use of drugs as first-line therapy for treating the underlying causes.<sup>24</sup>

- v. **Socioeconomic factors:** Socioeconomic factors may play a role in exacerbating risk and should be considered.<sup>25</sup>

## Rationale

Cardiovascular disease is the leading cause of death in BC, accounting for one in three deaths each year.<sup>26</sup> Studies have shown that vascular injury, progressing to cardiovascular disease in adulthood, begins in adolescence.<sup>9</sup> Emphasizing the early prevention of atherosclerosis and vascular damage by modifying risk factors such as smoking, excess body weight, low levels of physical activity and poor eating habits is of utmost importance.<sup>9</sup>

The following subsections include a brief review of the literature used to generate recommendations for the management of diabetes and elevated cholesterol in the prevention of cardiovascular disease. The final subsection provides the methodology used for obtaining evidence and describes the types of evidence used throughout this guideline.

**Diet:** Recommendations for the management and treatment of elevated cholesterol are based on recommendations from the Canadian Cardiovascular Society<sup>14</sup> and the National Cholesterol Education Program (NCEP).<sup>27,28</sup> Dietary strategies to improve morbidity and mortality from cardiovascular disease are based on the Canada Food Guide<sup>7</sup> and the American Heart Association dietary guidelines.<sup>8</sup>

**Diabetes:** Strategies to manage diabetes are based on the 2003 Canadian guideline<sup>11</sup> and the 2005 BC guideline Diabetes Care.<sup>12</sup> The BC diabetes guideline recommends a risk-based approach for lipid management. High-risk patients ( $\geq$  20 % CHD risk using the UKPDS chart) should be treated to an LDL target of 2.5 mmol/L. This approach is consistent with the 2003 Canadian diabetes guideline recommendations<sup>11</sup> as well as the ASPEN trial (lower risk: 12% smokers),<sup>29</sup> which showed no benefit with statins, and the CARDS trial,<sup>30</sup> which showed a benefit for a population at higher-risk (23% smokers). Lifestyle modification, including weight loss, reduced intake of saturated and trans fats,



increased dietary fibre and moderate exercise can reduce the risk of diabetes by 58%.<sup>5,31</sup> In women, lifestyle management and smoking cessation are associated with a 91% reduction in the risk of developing type II diabetes, excess weight being identified as the most significant contributing factor.<sup>32</sup>

**Dyslipidemia:** Recommendations for lipid testing and treatment of dyslipidemia are based on the 2006 Canadian Cardiovascular Society (CCS) position statement for the diagnosis and treatment of dyslipidemia<sup>14</sup> as well as peer-reviewed articles.<sup>16,20,29</sup> The recommendation for treatment of high-risk patients without heart disease to a target of 2.5 mmol/L LDL is consistent with the CCS statement that a target of 2.5 may provide adequate control for patients without established CVD. There is currently insufficient evidence to recommend the more aggressive treatment target of 2.0 for this patient population. It is recommended that apoB be used for follow-up of high-risk patients undergoing treatment with statins because this measure is more accurate than the calculated LDL value. If apoB is used, then a full lipid profile is unnecessary for follow-up.

**Evidence:** Evidence was obtained through a systematic review of peer-reviewed literature (up to June, 2007) using the databases MEDLINE, PubMed, EBSCO, Ovid, and the Cochrane Collaboration's Database for Systematic Reviews. Clinical practice guidelines from other jurisdictions for the primary prevention of cardiovascular disease, and the prevention and management of hypertension, diabetes, chronic kidney disease, dyslipidemia, congestive heart failure, cerebrovascular disease and overweight/obesity were also reviewed (up to June 2007). Pharmacologic recommendations are based on large, randomized controlled trials (RCTs) wherever possible. Lifestyle recommendations are based on large, prospective cohort trials. Evidence for the optimal frequency of lipid testing is lacking. Recommendations in this area are based on expert opinion.

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## Resources

**Guidelines and Protocols** Web site: <http://www.BCGuidelines.ca>

**St. Paul's Healthy Heart Program** Web site: <http://www.healthyheart.org/>

**The Heart and Stroke Foundation of BC and Yukon** (Web site: <http://www.heartandstroke.bc.ca> Telephone: 1 888 473-4636) has an extensive array of online healthy living resources including self-assessment tools and personalized management plans. The Foundation can also be contacted for community resources that are available for the prevention of cardiovascular disease.

**Canada's Food Guide** Web site: [http://www.hc-sc.gc.ca/fn-an/food-guide-aliment/index\\_e.html](http://www.hc-sc.gc.ca/fn-an/food-guide-aliment/index_e.html)

**The American Heart Association** (Web site: <http://www.americanheart.org>) has a number of resources available online, including an extensive diet guide <http://www.deliciousdecisions.org/>

**BC HealthGuide Online** Web site: [www.bchealthguide.org](http://www.bchealthguide.org)

**Dial-A-Dietitian** Web site: [www.dialadietitian.org](http://www.dialadietitian.org). Telephone: 1 800 667-3438 (Toll free) or 604 732-9191 (Greater Vancouver)

**Healthy Heart Society of BC** Web site: [www.heartbc.ca](http://www.heartbc.ca)

This guideline is based on scientific evidence current as of the effective date.

This guideline was developed by the Guidelines and Protocols Advisory Committee, approved by the British Columbia Medical Association and adopted by the Medical Services Commission.

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The principles of the Guidelines and Protocols Advisory Committee are to:

- encourage appropriate responses to common medical situations
- recommend actions that are sufficient and efficient, neither excessive nor deficient
- permit exceptions when justified by clinical circumstances.

## Appendices

Appendix A - Smoking Cessation

Appendix B - Framingham Instruction Sheet and Risk Assessment Chart

Appendix C - UKPDS Risk Assessment Chart

Appendix D - Apolipoprotein B

## Associated Document

Cardiovascular Disease - Primary Prevention. A Guide for Patients

## Appendix A – Part I: Smoking Cessation

Brief patient assessment for smoking cessation treatment in BC.

### Ask and Advise

1. Ask all patients if they currently smoke or use any other tobacco products. If yes, respectfully advise them to quit.

**Assess** (Note: complete questions 8 & 9 before administering or recommending a treatment).

2. Would you be willing to receive assistance to quit smoking in the next month?
  - Absolutely not: provide brief assistance (motivational counseling; identify benefits, barriers and concerns about quitting; build patient confidence; recommend *QuitNow* by phone [1 877 455-2233] or Web site [www.quitnow.ca])
  - Yes, absolutely: go to next question
3. Have you ever been diagnosed or treated by a doctor for schizophrenia, depression, alcohol or other substance abuse?
  - Yes: recommend appropriate pharmacotherapy and refer patient to most intense and specialized counseling available in your area (see section II, next page)
  - No: go to next question
4. On average, how many cigarettes do you smoke each day?
  - $\geq 15$ : recommend appropriate pharmacotherapy and refer to QuitNow or provide brief assistance to quit
  - $\leq 14$ : go to next question
5. How confident are you that you will be able to quit smoking and remain smoke free?
  - Very confident (1 point)
  - A little confident (2 points)
  - Not at all confident (3 points)
6. Do you have at least one person you can count on for support while you quit smoking?
  - Yes (1 point)
  - No (2 points)
7. Would you describe your life as:
  - Not at all stressful (1 point)
  - A little stressful (2 points)
  - Moderately stressful (3 points)
  - Very stressful (4 points)

### Add together points from questions 5, 6 and 7:

If  $> 6$ : provide brief assistance to quit or refer patient to QuitNow by phone (1 877 455-2233) or use QuitNow Physician Fax Referral form

If  $\leq 6$ : provide or arrange for self-help book or Web site (www.quitnow.ca) for self-help materials

### Assist or Arrange

8. Have you previously used [treatment from questions 2-4]?
  - Yes: go to next question
  - No: provide or recommend treatment as described in the previous section
9. Do you think you would benefit from trying it again?
  - Yes: provide or recommend treatment as described in the previous section
  - No: provide or recommend the next most intensive treatment identified in the previous section

## Appendix A – Part II: Effective pharmacological aids to smoking cessation

Note: Pharmacologic aids should be used in conjunction with behavioural intervention, such as self-help or brief counseling. Where possible, heavy smokers and people with schizophrenia, depression and alcohol or other substance abuse should receive more intensive individual counseling. Both over-the-counter and prescription medicines are available.

### Over-the-counter

**Nicotine Replacement Therapy (NRT):** All forms of nicotine replacement are available without a prescription. All four forms (gum, patch, nasal spray, inhaler) are equally effective and increase the likelihood of quitting by 50% to 100% compared to placebo.<sup>1</sup> Eight weeks of therapy is normally as effective as longer doses.<sup>1</sup> However, longer courses of treatment may be indicated for heavy smokers or for those with low self-confidence. The type of NRT should depend on susceptibility to adverse events, patient preference and availability. Combining different types of NRT<sup>1</sup> or NRT with other pharmacologic aids may provide additional benefit in difficult cases. NRT is safe for most patients, including those with heart disease and those who have experienced recent heart attack and stroke.<sup>2,3,4</sup> Avoid use in persons with severe, uncontrolled arrhythmias or angina. Although safe, efficacy among smokers under age 18 is undetermined.

- Gum: Common dosages: 2 mg or 4 mg. To be effective, the gum requires a repeated sequence of brief chew then ‘parking’ between cheek and gum. Move gum around in the mouth to avoid ulcers. Relatively rapid delivery is good for addressing cravings and stress-induced smoking. 4 mg is more effective than 2 mg with heavy smokers.<sup>1</sup>
- Patch: Common dosages: 7 mg, 14 mg and 21 mg for the 24-hour patch, and 15 mg for the 16-hour patch. The patch is a convenient form that delivers a steady, continuous low-dose of nicotine. One patch is normally worn for 24-consecutive hours, although it can be removed at bedtime for patients who experience sleep disturbances.<sup>5</sup> Avoid use in persons with allergies to band aid adhesives.
- Nasal spray: Works like gum to provide a rapid low-dose of nicotine to help control cravings. A single dose can be administered up to five times per hour and up to 40 times in 24 hours. The nasal spray should not be used for more than 6 months.
- Inhaler: Low-dose nicotine is inhaled or puffed through a mouthpiece which converts nicotine into a vapour that is absorbed through the mouth and throat. It is normally used to control cravings that may be particularly acute shortly after quitting. Each cartridge delivers up to 4 mg of nicotine. Use a maximum of 16 cartridges per day. Do not use longer than 6 months. Using the inhaler below room temperature can reduce the amount of nicotine that is inhaled.

### Prescription

**Bupropion SR:** Bupropion is an “atypical” antidepressant which has been shown to double the success rate for smokers who are trying to quit.<sup>5</sup> Common adverse effects include insomnia (35%), dry mouth (10%) and nausea. Serious adverse effects are rare, but include seizure (1/1000). It is commonly prescribed at 150 mg twice daily, less for smaller patients. If insomnia occurs, the later dose may be discontinued. It is commonly given over a couple of months, beginning one week before the quit date.<sup>5</sup>

**Nortriptyline:** Nortriptyline is an older, generic tricyclic antidepressant which also doubles the success rate of quitting. About 7% of patients will discontinue use due to adverse effects, such as dry mouth, drowsiness and constipation. Serious adverse effects are rare but overdoses can be lethal. It is commonly prescribed between 75 mg and 150 mg (start with a lower dose and titrate up) at bedtime over a couple of months, beginning one week before the quit date.<sup>6</sup>

**Clonidine:** Clonidine is an older medication used to lower blood pressure. It lessens the early symptoms of nicotine withdrawal and improves the quit rate. The usual dose is 0.1 mg to 0.2 mg twice daily over the initial 3-4 weeks of smoking cessation, either beginning a few days before the quit date or starting during the first few weeks after the quit date if nicotine withdrawal symptoms are prominent despite nicotine replacement.<sup>7</sup>

**Varenicline (Champix):** Varenicline is a relatively new treatment that blocks nicotine receptors in the brain. It appears to be more effective than Bupropion for moderate and heavy smokers without medical complications.<sup>8-11</sup> Efficacy with broader populations of smokers is still to be determined. Start administration at least one week before the quit date. Consume 0.5 mg (the “white” pills) once a day on days 1 to 3; 0.5 mg (white pills) twice a day for days 4 to 7; 1.0 mg (blue tablet) twice a day from day 8 (quit day) to the end of treatment. Normally used for 12 weeks, but extended doses may further enhance effectiveness.<sup>11</sup> Common adverse effects include nausea, dreaming, constipation, gas and vomiting. Varenicline should not be used by persons with kidney problems, pregnant or breastfeeding women and children under age 18. Exercise caution in persons who take insulin, asthma medications or blood thinners.

**Not supported by evidence:**

- SSRIs
- Naltrexone
- Amphetamines
- Acupuncture

**References**

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**Appendix A – Part III: Patient Handout**

**QUIT SMOKING: IT'S TIME TO ACT\***

I am being urged to quit now because:

My current annual costs for smoking (and my savings after quitting) are:

<b>PACKS PER DAY</b>	<b>ANNUAL COST</b> (at \$9/pack)	<b>REQUIRED EARNINGS</b> (at 25% rate income tax)	<b>DAYS WORKED TO BUY</b> (at \$20/hr-8hrs/day)
1/2	\$1642	\$2053	12.8
1	\$3285	\$4106	25.7
1½	\$4927	\$6159	38.5
2	\$6570	\$8212	51.3

**MY QUIT DATE**  
(within 2-3 weeks)

YY	MM	DD

**MY FOLLOW-UP APPOINTMENT**  
(3-7 days after quit date)

YY	MM	DD

**From now until your quit date:**

- Hold your cigarettes in the opposite hand to that which you normally use. This will help reduce the feeling of needing something in the hand (and hence reduce cigarette-related thoughts) when you finally come to quitting.
- Don't smoke during your common "habit times" (e.g. coffee break / driving home), even if it means smoking twice as much at other times. This will also reduce the strength of environmental triggers, and reduce smoking related thoughts, while quitting.
- If you have been prescribed Bupropion (Zyban, Wellbutrin), Nortriptyline or Varenicline (Champix), you should start taking it one week before your quit date. Clonidine is started 3 days before the quit date.
- Spouses who continue to smoke while you are quitting are a substantial hurdle and should be encouraged to quit at the same time (If they are my patient, tell them to come see me please!).

**After your quit date:**

- Take a break, even if it is only for a minute or two, when you are craving a cigarette. Pausing to smoke breaks potentially monotonous or difficult tasks into smaller, bite-sized bits. You may be craving the interruption of your current task as much as you are craving the cigarette.
- The physical addiction to nicotine can be left behind over a period of a few weeks. After that, enough time must pass for the old cigarette related associations to fade. Old habits die hard but, given enough time, they do die.
- While nicotine replacement is often added to Bupropion or Nortriptyline after the quit date to lessen withdrawal, it is counterproductive to combine nicotine replacement with Varenicline.

\* Reproduced with permission from Dr. Scott Garrison, M.D.



## INSTRUCTIONS

Colour charts are provided to assess the risk of total coronary heart disease events (per 100 patients in 10 years). The colour charts are based on the Framingham study and more recent adaptations to include untreated blood pressure and blood pressure after treatment. The numbers in the charts are consistent with the National Cholesterol Education Point (NCEP) system used in the US and also used in Canada. The colour coding represents **zones of risk** with an increasing benefit to harm ratio according to increasing risk of coronary heart disease.

GREEN ZONE <10%	YELLOW ZONE 10 - 19%	RED ZONE ≥20%
Evidence that the benefit of pharmacologic treatment exceeds harm is poor in the green zone. Lifestyle approaches would be more suitable.	Benefit does not clearly exceed harm due to adverse events, but there is increasing probability of net benefit with increasing risk of CHD.	Benefit to harm ratio is best in this zone and pharmacologic treatment with blood pressure lowering medication and/or low dose statins is more appropriate in this risk zone.

Benefit per 100 patients/5 years can be estimated as 10% of the value in the Framingham risk chart.

**Note:** This assumes a 20% risk reduction of CHD based on average outcomes for appropriately used blood pressure lowering medications and statin medications.

MALE
55 yrs, non-smoker, systolic BP 150 Framingham risk = 12% Benefit (absolute) = 1.2%/5 yrs.

FEMALE
55 yrs, non-smoker, systolic BP 150 Framingham = 4% Benefit (absolute) = 0.4%/5 yrs.

For example ➡

**Absolute benefit of treatment should be derived from the risk charts using Untreated Blood Pressure.** Use the risk in the charts labelled Blood Pressure after Treatment for initial assessment only when a patient's blood pressure before treatment is unknown. Risk comparison between the untreated and treated blood pressure charts for the same patient may not be valid because the charts are derived from large statistical aggregates.

Adverse events are difficult to quantify and poorly reported in clinical trials with low to moderate risk populations.

**CAUTION:** The charts are based on a population-based approach assessed in a predominantly white, North American population. Individual risk may vary a great deal from the population mean for any particular cluster of risk factors. Risks may be different for non-Caucasian populations.

For complete Guideline information, visit [www.bcguidelines.ca](http://www.bcguidelines.ca)

# FRAMINGHAM Ten-Year Coronary Heart Disease Risk (%) UNTREATED BLOOD PRESSURE

**WOMEN: Non-Smoking**



BP (systolic)	TC/HDL*	AGE (years)					
		50-54	55-59	60-64	65-69	70-74	75-79
120-129	4	1	2	2	4	5	6
	5	2	2	3	5	6	8
	6	2	3	4	6	8	11
130-139	4	2	2	3	5	6	8
	5	2	3	4	6	8	11
	6	3	4	5	8	11	14
140-159	4	2	3	4	6	8	11
	5	3	4	5	8	11	14
	6	4	5	6	11	14	17
≥160	4	3	4	5	8	11	14
	5	4	5	6	11	14	17
	6	5	6	8	14	17	22

<span style="background-color: #2e8b57; width: 15px; height: 10px; display: inline-block;"></span> LOW RISK
<span style="background-color: #ffff00; width: 15px; height: 10px; display: inline-block;"></span> MODERATE RISK
<span style="background-color: #ff4500; width: 15px; height: 10px; display: inline-block;"></span> HIGH RISK

**MEN: Non-Smoking**



BP (systolic)	TC/HDL	AGE (years)						
		40-44	45-49	50-54	55-59	60-64	65-69	70-74
120-129	4	1	3	5	8	10	12	16
	5	3	5	8	10	12	16	16
	6	4	6	10	12	16	20	20
130-139	4	2	4	6	10	12	16	20
	5	4	6	10	12	16	20	20
	6	5	8	12	16	20	25	25
140-159	4	2	4	6	10	12	16	20
	5	4	6	10	12	16	20	20
	6	5	8	12	16	20	25	25
≥160	4	2	5	8	12	16	20	25
	5	5	8	12	16	20	25	25
	6	6	10	16	20	25	≥30	≥30

**WOMEN: Smoking**



BP (systolic)	TC/HDL	AGE (years)					
		50-54	55-59	60-64	65-69	70-74	75-79
120-129	4	5	5	5	6	6	8
	5	6	6	6	8	8	11
	6	8	8	8	11	11	14
130-139	4	6	6	6	8	8	11
	5	8	8	8	11	11	14
	6	11	11	11	14	14	17
140-159	4	8	8	8	11	11	14
	5	11	11	11	14	14	17
	6	14	14	14	17	17	22
≥160	4	11	11	11	14	14	17
	5	14	14	14	17	17	22
	6	17	17	17	22	22	27

**MEN: Smoking**



BP (systolic)	TC/HDL	AGE (years)						
		40-44	45-49	50-54	55-59	60-64	65-69	70-74
120-129	4	6	10	12	16	16	16	20
	5	12	16	20	20	20	20	20
	6	16	20	25	25	25	25	25
130-139	4	8	12	16	20	20	20	25
	5	16	20	25	25	25	25	25
	6	20	25	≥30	≥30	≥30	≥30	≥30
140-159	4	8	12	16	20	20	20	25
	5	16	20	25	25	25	25	25
	6	20	25	≥30	≥30	≥30	≥30	≥30
≥160	4	10	16	20	25	25	25	≥30
	5	20	25	≥30	≥30	≥30	≥30	≥30
	6	25	≥30	≥30	≥30	≥30	≥30	≥30

\*TC/HDL – total cholesterol to high-density lipoprotein ratio

# FRAMINGHAM Ten-Year Coronary Heart Disease Risk (%) BLOOD PRESSURE AFTER TREATMENT

**WOMEN: Non-Smoking**



BP (systolic)	TC/HDL	AGE (years)					
		50-54	55-59	60-64	65-69	70-74	75-79
120-129	4	2	3	4	6	8	11
	5	3	4	5	8	11	14
	6	4	5	6	11	14	17
130-139	4	3	4	5	8	11	14
	5	4	5	6	11	14	17
	6	5	6	8	14	17	22
140-159	4	4	5	6	11	14	17
	5	5	6	8	14	17	22
	6	6	8	11	17	22	27
≥160	4	5	6	8	14	17	22
	5	6	8	11	17	22	27
	6	8	11	14	22	27	≥30

LOW RISK
MODERATE RISK
HIGH RISK

**MEN: Non-Smoking**



BP (systolic)	TC/HDL	AGE (years)						
		40-44	45-49	50-54	55-59	60-64	65-69	70-74
120-129	4	2	4	6	10	12	16	20
	5	4	6	10	12	16	20	25
	6	5	8	12	16	20	25	25
130-139	4	2	5	8	12	16	20	25
	5	5	8	12	16	20	25	25
	6	6	10	16	20	25	≥30	≥30
140-159	4	2	5	8	12	16	20	25
	5	5	8	12	16	20	25	25
	6	6	10	16	20	25	≥30	≥30
≥160	4	3	6	10	16	20	25	25
	5	6	10	16	20	25	≥30	≥30
	6	8	12	20	25	≥30	≥30	≥30

**WOMEN: Smoking**



BP (systolic)	TC/HDL	AGE (years)					
		50-54	55-59	60-64	65-69	70-74	75-79
120-129	4	8	8	8	11	11	14
	5	11	11	11	14	14	17
	6	14	14	14	17	17	22
130-139	4	11	11	11	14	14	17
	5	14	14	14	17	17	22
	6	17	17	17	22	22	27
140-159	4	14	14	14	17	17	22
	5	17	17	17	22	22	27
	6	22	22	22	27	27	≥30
≥160	4	17	17	17	22	22	27
	5	22	22	22	27	27	≥30
	6	27	27	27	≥30	≥30	≥30

**MEN: Smoking**



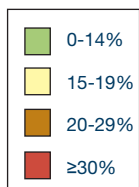
BP (systolic)	TC/HDL	AGE (years)						
		40-44	45-49	50-54	55-59	60-64	65-69	70-74
120-129	4	8	12	16	20	20	20	25
	5	16	20	25	25	25	25	25
	6	20	25	≥30	≥30	≥30	≥30	≥30
130-139	4	10	16	20	25	25	25	25
	5	20	25	≥30	≥30	≥30	≥30	≥30
	6	25	≥30	≥30	≥30	≥30	≥30	≥30
140-159	4	10	16	20	25	25	25	25
	5	20	25	≥30	≥30	≥30	≥30	≥30
	6	25	≥30	≥30	≥30	≥30	≥30	≥30
≥160	4	12	20	25	25	25	25	25
	5	25	≥30	≥30	≥30	≥30	≥30	≥30
	6	≥30	≥30	≥30	≥30	≥30	≥30	≥30

Absolute benefit of treatment should be derived from the risk charts using untreated blood pressure. Use the risk in the blood pressure after treatment charts for initial assessment only when a patient's blood pressure before treatment is unknown. Risk comparison between the untreated and treated blood pressure charts for the same patient may not be valid because the charts are derived from large statistical aggregates.

# UKPDS Risk Calculator for Coronary Heart Disease Risk for Patients with Type 2 Diabetes

## 10-year risk (%) of CHD for patients with five-year history of diabetes compared to baseline risk\*

These Risk Charts are adapted from the UKPDS Risk Engine version 2.0. It should be used in preference to the Framingham Calculator. It does not include calculations based on non-white populations nor for those with atrial fibrillation. For patients with additional risk factors, download the full version at [www.dtu.ox.ac.uk](http://www.dtu.ox.ac.uk)



Derived from: The UKPDS risk engine: a model for the risk of coronary heart disease in Type 2 diabetes (UKPDS 56) Stevens RJ et al. Clinical Science 2001; 101:671-679.

BP: Systolic Blood Pressure  
TC/HDL: Ratio of Total Cholesterol (TC)/High Density Lipoprotein Cholesterol (HDL-C)  
HbA1C: Glycosylated Hemoglobin (Hemoglobin A1c)  
N= normal HbA1C

To estimate CHD risk for 10-year history of diabetes, add 10% (multiply x 1.1).

\*Baseline risk = HbA1C <6%

♂ MALE			AGE 55				AGE 60				AGE 65			
Smoking	BP	TC/HDL	HbA1c(%)				HbA1c(%)				HbA1c(%)			
			N	6	7	8	N	6	7	8	N	6	7	8
🚭	120	4	10	11	13	14	13	15	16	19	17	19	21	24
		5	12	14	16	18	15	18	21	23	21	24	27	30
		6	15	17	19	22	18	22	25	28	25	28	32	35
	140	4	11	12	14	16	14	16	18	20	18	20	23	26
		5	14	15	17	20	16	20	22	25	23	25	28	32
		6	16	18	21	23	20	24	27	30	27	30	34	38
	160	4	12	13	15	17	15	17	19	22	19	22	25	28
		5	15	17	19	21	19	21	24	27	24	27	31	34
		6	18	20	22	25	23	26	29	32	29	32	36	40
🚬	120	4	13	15	17	19	17	19	22	24	22	25	28	31
		5	16	19	21	24	21	24	27	30	27	30	34	38
		6	20	22	25	28	25	29	32	36	32	36	40	44
	140	4	14	16	18	20	18	21	23	26	24	26	30	33
		5	18	20	23	25	23	26	29	32	27	33	37	40
		6	21	24	27	30	27	31	34	38	32	39	43	47
	160	4	15	17	19	22	20	22	25	28	25	28	32	35
		5	19	22	24	27	25	28	31	35	29	35	39	43
		6	23	26	29	32	29	33	37	41	35	41	45	50

♀ FEMALE			AGE 55				AGE 60				AGE 65			
Smoking	BP	TC/HDL	HbA1c(%)				HbA1c(%)				HbA1c(%)			
			N	6	7	8	N	6	7	8	N	6	7	8
🚭	120	4	5	6	7	8	7	8	9	10	9	10	12	13
		5	7	8	9	10	9	10	11	13	12	13	15	17
		6	8	9	11	12	11	12	14	16	14	16	18	20
	140	4	6	7	7	8	8	9	10	11	10	11	13	14
		5	7	8	9	11	10	11	12	14	13	14	16	18
		6	9	10	12	13	12	13	15	17	15	17	19	22
	160	4	6	7	8	9	8	9	11	12	11	12	14	16
		5	8	9	10	12	10	12	13	15	14	15	17	20
		6	10	11	12	14	13	14	16	18	16	19	21	24
🚬	120	4	7	8	9	10	9	11	12	14	12	14	16	18
		5	9	10	12	13	12	13	15	17	15	17	20	22
		6	11	12	14	16	14	16	18	21	19	21	24	26
	140	4	8	9	10	11	10	11	13	15	13	15	17	19
		5	10	11	13	14	13	14	16	18	17	19	21	24
		6	12	13	15	17	15	17	20	22	20	23	25	28
	160	4	8	9	11	12	11	12	14	16	14	16	18	21
		5	11	12	14	15	14	16	18	20	18	20	23	26
		6	13	15	16	19	17	19	21	24	22	24	27	30

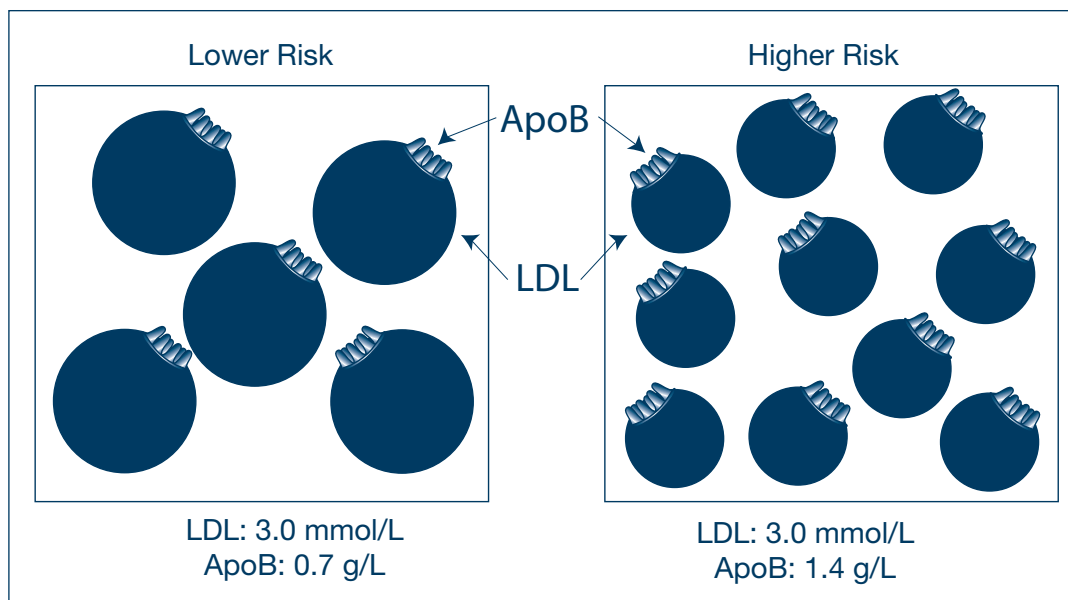
## Appendix D – Apolipoprotein B

Each LDL lipoprotein particle contains just one molecule of apolipoprotein (apo) B. This makes it soluble in blood and also targets it to the appropriate LDL receptors. Thus the concentration of apoB reflects the NUMBER of the atherogenic LDL particles. This has been shown to be a superior predictor of outcomes in patients treated for dyslipidemia.<sup>1</sup>

Therefore measurement of plasma apoB is superior as a follow up to the full lipid profile specifically in patients in whom the major abnormality is hypercholesterolemia and who are treated with statins. It is less expensive than the lipid profile and can be done on a non-fasting specimen.

It is not a good follow-up test in patients with pronounced hypertriglyceridemia (TG's > 5.0 mmol/L), although in these patients the baseline apoB helps to distinguish between the more atherogenic familial combined dyslipidemia (high apoB) and the less atherogenic familial hypertriglyceridemia (normal or low apoB). Very low apoB in face of high TG's and cholesterol is suggestive of dysbetalipoproteinemia (type III disease).

**Figure 1. Relationship between LDL and ApoB**



## Reference

1. Barter PJ, Ballantyne CM, Carmena R, et al. Apo B versus cholesterol in estimating cardiovascular risk and in guiding therapy: report of the thirty-person/ten-country panel. *J Int Med* 2006;259:247-258.



# Preventing Cardiovascular Disease

## A GUIDE FOR PATIENTS

Effective Date: March 15, 2008

### What is cardiovascular disease?

Cardiovascular disease (CVD) is a common term used for a number of medical conditions that affect the heart and/or blood vessels. Examples include atherosclerosis (arterial disease or hardening of the arteries), coronary heart disease, heart failure and arrhythmia (irregular heart beat). Diabetes, hypertension, stroke and kidney disease are related disorders that also affect the circulatory system.

Cardiovascular disease is the leading cause of death in BC, accounting for one in three deaths each year. Studies have shown that vascular injury, progressing to cardiovascular disease in adulthood, begins in adolescence. Emphasizing the early prevention of atherosclerosis and vascular damage by modifying risk factors such as smoking, excess body weight, low levels of physical activity and poor eating habits is of utmost importance.

### How do I know if I am at risk of developing cardiovascular disease?

**Smoking:** Smoking is a key risk factor for heart attack and stroke. People who currently smoke have a significantly higher risk of developing cardiovascular disease than non-smokers.

**Elevated blood pressure:** Elevated blood pressure (hypertension) can lead to a number of potentially life-threatening conditions if it is not controlled or treated. Talk to your doctor about your blood pressure and ask to have it checked regularly. For information on hypertension and how frequently you should have your blood pressure measured, see the BC guideline and patient guide for hypertension ([www.BCGuidelines.ca](http://www.BCGuidelines.ca)).

**Diabetes (type I and type II):** People with diabetes are at an increased risk of developing cardiovascular disease. Prevention of diabetes through a healthful diet and increased physical activity (to maintain a healthy body weight), and effective management of diabetes through a healthy lifestyle and medications where appropriate, are critical in reducing cardiovascular disease risk. For further information on the prevention and management of type I and type II diabetes, see the BC diabetes guideline and patient guide at [www.BCGuidelines.ca](http://www.BCGuidelines.ca).

**Lipid (cholesterol) testing:** Elevated triglycerides and LDL cholesterol are associated with an increased risk of cardiovascular disease. Lipid tests may be needed to test for elevated triglycerides and cholesterol in men over age 40 and women over age 50. If you have other risk factors, such as smoking, hypertension, diabetes, kidney disease or abdominal obesity, you should have your lipids tested by age 40. A family history of early coronary artery disease (onset before age 55) or a family history of severe hyperlipidemia (high cholesterol) also indicates that tests should be done earlier.

**Framingham risk assessment:** Your doctor may assess your risk (likelihood) of coronary heart disease using a tool called the Framingham risk assessment chart. This is based on a number of known risk factors such as age, gender, smoking status, blood pressure and cholesterol or lipid concentrations.

The good news is that heart disease and stroke are often caused by things that you can change, such as quitting smoking if you are a smoker, incorporating more physical activity into your day, losing weight if you are overweight and eating a healthful diet.

A few small changes in your daily routine, such as walking two flights of stairs per day instead of taking the elevator or using milk in your coffee instead of cream, can help improve your health and sense of well-being.

- ✓ **Smoking cessation:** Quitting smoking is the most effective way to reduce the risk of heart disease, stroke, kidney disease, lung cancer and chronic lung disease (COPD). For assistance to quit, call QuitNow Services at 1 877 455-2233 (toll-free in BC, 24/7/365), or obtain self-help materials from their Web site at [www.quitnow.ca](http://www.quitnow.ca). Ask your doctor for the personal smoking cessation aid, called “Quit smoking: It’s time to act” associated with the cardiovascular disease prevention guideline.
- ✓ **Physical Activity:** Exercise is one of the best things you can do for your health and heart. Build physical activity into your daily routine by walking wherever and whenever you can, stretching and moving around frequently, taking the stairs instead of the elevator and participating in activities that you enjoy. Work towards incorporating at least 30-60 minutes of moderate activity 4-7 days per week (moderate activity includes: walking 3 km [2 miles] in 30 minutes once per day, or 1.5 km [1 mile] in 15 minutes two times per day, jogging, cycling or swimming).
- ✓ **Overweight/Obesity:** A body-mass index of greater than 27, or a waist circumference greater than 90 cm/102 cm (35”/40”) for men (Asian/Caucasian) and 80 cm/88 cm (32”/35”) for women (Asian/Caucasian), is associated with an increased risk of cardiovascular disease. To accurately measure your waist, place the tape measure between your hip bone and rib cage (near the belly button). Losing weight through a combination of a healthful diet and increased physical activity will lower your risk of a heart attack and stroke, as well as lower your risk of developing hypertension, kidney disease and type II diabetes.
- ✓ **Diet:** Eating foods that are low in saturated fat, trans-fat and cholesterol (< 300 mg/day), and high in fibre is an effective way to reduce your risk of developing cardiovascular disease. Recent studies also show a major benefit from consuming vegetables, fruits, fish (at least 2 servings per week) and low-fat dairy products, as well as limiting salt intake to less than 1 tsp (5 ml) per day. Be aware of the “hidden” salt content of processed foods, such as lunchmeat, canned soups and pasta. Consult Canada’s Food guide for dietary advice. If you have CVD or another condition that increases your risk of CVD (such as diabetes, dyslipidemia, hypertension or obesity), ask your doctor for a referral to a dietitian to obtain personalized dietary advice to help reduce your risk.

Additional lifestyle management information, specifically on healthy eating, physical activity and smoking cessation, may be found at [www.actnowbc.ca](http://www.actnowbc.ca). ActNowBC recommends 0/5/30 as follows:

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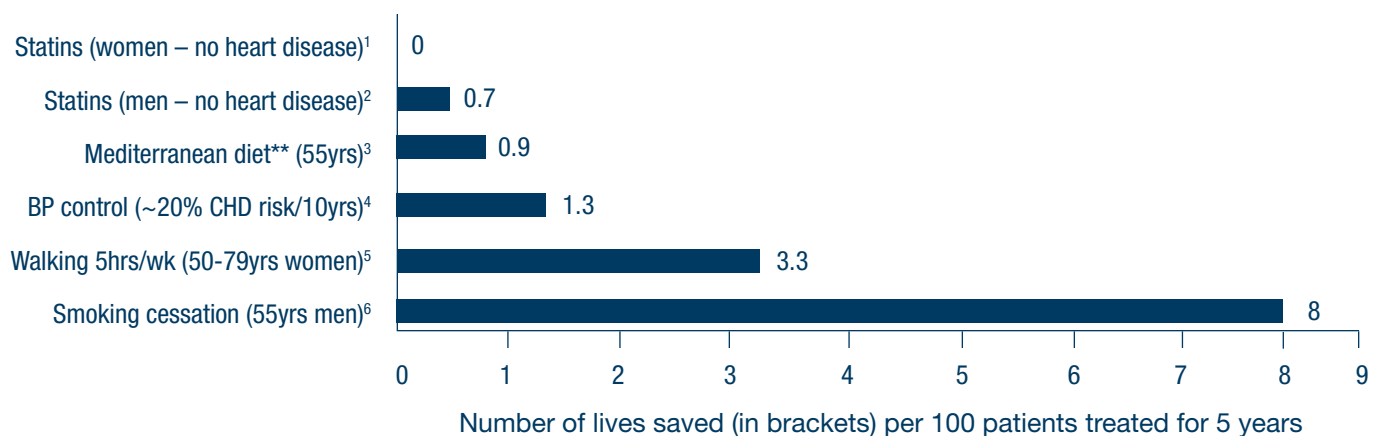
<b>0</b>	<b>Smoking: Complete avoidance of tobacco smoke</b>
<b>5</b>	<b>Servings of fruits and vegetables per day (minimum)</b>
<b>30</b>	<b>Minutes of moderate-intensity activity per day (minimum)</b>

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- ✓ **Blood pressure (BP) control:** To lower your blood pressure, follow the above recommendations for smoking cessation, physical activity, overweight/obesity and diet. If lifestyle changes are insufficient in lowering your blood pressure, consult your physician about taking blood pressure lowering medications. For more information on blood pressure control, consult the guideline *Hypertension – Detection, Diagnosis and Management* found at [www.BCGuidelines.ca](http://www.BCGuidelines.ca).

- ✓ **Diabetes management:** Lifestyle changes related to diet and exercise can help control your blood glucose level. For some patients, medications may also be required for effective blood glucose control. For more information on the management of type II diabetes, consult the guideline Diabetes Care found at [www.BCGuidelines.ca](http://www.BCGuidelines.ca).
- ✓ **Aspirin therapy:** For people who are at high risk of cardiovascular disease (greater than 20% over 10 years), and who are younger than 70 years old, low-dose (e.g. 81 mg) aspirin therapy is recommended.
- ✓ **Lipid management:** Lipid levels may be controlled by lifestyle management. Most people who do not have heart disease will not need lipid-lowering medications, even if lipid levels remain elevated. Lipid-lowering drugs may be indicated for higher risk patients.

**Figure 1. Mortality benefits of lifestyle modification (smoking cessation, walking, Mediterranean diet) compared to prescription medication management (BP control, statins) for patients without heart disease.\***



\* The benefit of treatment (number of lives saved) may vary depending on the level of risk (i.e., low, moderate, high). Generally, high-risk patients benefit more from the treatment methods listed above than lower-risk patients.

\*\* Key elements of the Mediterranean diet are more whole-grain bread, more fruits and green vegetables, more fish, less red meat, no butter or cream, and oils/spreads restricted to olive oil. Moderate alcohol consumption (wine) is usually permitted.

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## Resources

**The Guidelines and Protocols** Web site ([www.BCGuidelines.ca](http://www.BCGuidelines.ca)) has more detailed information about the management of diseases such as hypertension and diabetes.

**The BC HealthGuide Online** (Web site: [www.bchealthguide.org](http://www.bchealthguide.org)) provides detailed information on how to reduce your risk of developing cardiovascular disease. For example, search for information on smoking cessation, prevention of coronary artery disease, hypertension, chronic kidney disease, diabetes, and lifestyle changes such as the therapeutic lifestyle changes diet, Mediterranean diet, DASH diet, physical activity and heart health.

**The Heart and Stroke Foundation of BC and Yukon** (Web site: [www.heartandstroke.ca](http://www.heartandstroke.ca)) offers excellent materials for the control of modifiable lifestyle factors that contribute to hypertension, heart disease, stroke and kidney disease. This includes many useful tools and resources for healthy living, and personalized management plans to develop goals. The Foundation can also be helpful in directing you to community resources for healthy living. Telephone: 1 888 473-4636 (Toll free) (BC/Yukon division office)

**Dial-A-Dietitian** (Web site: [www.dialadietitian.org](http://www.dialadietitian.org)) provides accessible, quality information to the public and health information providers throughout British Columbia about nutrition. Registered dietitians provide nutrition consultation by phone. Telephone: 1 800 667-3438 (Toll free) or 604 732-9191 (Greater Vancouver)

**American Heart Association** (Web site: [www.americanheart.org](http://www.americanheart.org))

**Mayo Clinic** (Web site: [www.mayoclinic.com](http://www.mayoclinic.com))

**Healthy Heart Society of BC** (Web site: [www.heartbc.ca](http://www.heartbc.ca))

**St. Paul's Healthy Heart Program** (Web site: <http://www.healthyheart.org/>)