Cholesterol and Cardiovascular Disease

Backgrounder

Cholesterol

- Cholesterol is one of the fats in your blood which your body uses to make cell membranes, vitamin D and hormones, and without it, our bodies could not function.[1]

- There are two main types of cholesterol:[2]
  - Low-density lipoprotein (LDL) cholesterol – often called "bad" cholesterol because high levels of LDL-cholesterol in the blood promotes the build-up of plaque in the artery walls
  - High-density lipoprotein (HDL) cholesterol – often called "good" cholesterol because it helps carry LDL-cholesterol away from the artery walls

- Approximately 80% of cholesterol is produced naturally in the body; the other 20% comes from diet.[3]

- Coronary artery disease (CAD), the most common form of heart disease, is caused by the build-up of plaque, which is made up of cholesterol, fatty compounds, calcium and fibrin.[4]

- The 2006 guidelines from the Canadian Cardiovascular Society are now stricter for patients at high risk of cardiovascular disease, setting target LDL-cholesterol at less than 2.0 mmol/L instead of less than 2.5 mmol/L[5]. This means that 70% of high-risk Canadians on statin monotherapy may not be at goal for LDL-cholesterol and may therefore need additional therapy.[6]

Risk level	10-year CAD risk	Recommendations
High	≥ 20%	Treatment targets: Primary target: LDL-C <2.0 mmol/L Secondary target: TC/HDL-C <4.0
Moderate	10% – 19%	Treat when: LDL-C ≥ 3.5 mmol/L or TC/HDL-C ≥ 5.0
Low	<10%	Treat when: LDL-C ≥ 5.0 mmol/L or TC/HDL-C ≥ 6.0

Table legend: High risk includes coronary artery disease (CAD), peripheral artery disease, cerebrovascular disease and most patients with diabetes. HDL-C = High-density lipoprotein cholesterol; LDL-C = Low-density lipoprotein cholesterol; TC = Total cholesterol[7]

- Risk factors contributing to high cholesterol include:[8,9]
  - *Age and gender:* Cholesterol levels rise as men and women get older. Also, after menopause, women tend to have higher LDL-cholesterol levels than men
  - *Heredity:* High cholesterol can run in families
  - *Ethnicity:* People of First Nations, African or South Asian descent are at a greater risk of heart disease
  - *Diet:* Foods high in saturated fats
  - *Weight:* Being overweight is a risk factor for heart disease and tends to increase cholesterol
  - *Lifestyle:* Being physically inactive increases the risk of heart disease

- In order to help lower cholesterol, diet and lifestyle modifications should be made, including eating foods low in saturated fat, trans fat and cholesterol as well as maintaining an active lifestyle and not smoking.[10]

- Over 30 years of experimental, clinical and epidemiological studies have confirmed that elevated LDL-cholesterol is a major independent and modifiable risk factor for the development of cardiovascular disease.[11]

- In a study of high-risk patients (Heart Protection Study), lowering LDL-cholesterol by 1 mmol/L was associated with a 25% cardiovascular risk reduction.[12]

- The lifetime risk of developing coronary artery disease by 40 years of age is approximately one in two for men and one in three for women.[13]

High cholesterol and cardiovascular disease (CVD)

- Almost 40% of Canadian adults are classified as having high blood cholesterol levels, which is approximately 12 million people.[14]

- Cardiovascular disease cut short an estimated 17 million lives last year, making it the leading cause of death worldwide.[15]

- In 2002, CVD accounted for 74,626 Canadian deaths, more than any other disease.[16]

- Between fiscal years 1997/1998 and 1999/2000, a total of 83,406 patients were hospitalized for heart failure across Canada.[17]

- In 2002, 32% of all male deaths and 34% of all female deaths in Canada were due to heart disease, diseases of the blood vessels and stroke. [18]

- CVD was the most common reason for hospitalization in 1993 and remained so in 2000.[19]

- In 2000, cardiovascular disease costs were estimated to be $20.1 billion, including the direct costs of treatment and indirect costs such as lost productivity due to premature mortality.[20]

- The cardiovascular death rate in Canada follows an east to west gradient, with the highest death rate in Newfoundland and Labrador and the lowest death rate in British Columbia.[21]

Sources:

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[1] Heart and Stroke Foundation, Booklet entitled "*Living with Cholesterol, Cholesterol and healthy living*", page 3.
[2] Heart and Stroke Foundation, Booklet entitled "*Living with Cholesterol, Cholesterol and healthy living*", page 5
[3] Heart and Stroke Foundation, Booklet entitled "*Living with Cholesterol, Cholesterol and healthy living*", page 3
[4]Texas Heart Institute Web site. (Accessed at http://texasheart.org/HIC/Topics/Cond/CoronaryArteryDisease.cfm).
[5] McPherson, R et al. Canadian Cardiovascular Society position statement – Recommendations for the diagnosis and treatment of dyslipidemia and prevention of cardiovascular disease. *Can J Cardiol* 2006:22(11):913-927.
[6] Extrapolated from Bourgault, C et al. Statin therapy in Canadian patients with hypercholesterolemia: The Canadian Lipid Study – Observational (CALIPSO). *Can J Cardiol* 2005;21(13):1187-1193.
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[18] Heart and Stroke Foundation Web Site. (Accessed on September 2, 2006 at http://ww2.heartandstroke.ca/Page.asp?PageID=33&ArticleID=1077&Src=news&From=SubCategory).
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[21] Manuel, Douglas G. et al. Burden of cardiovascular disease in Canada. Published in the *Canadian Journal of Cardiology*. 2003;19(9):997-1004.