## Risk Factors for Heart Disease & Healthy Lifestyle Choices

Prepared by ACSM Registered Clinical Exercise Physiologists & Exercise Specialists

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### Coronary Artery Disease (CAD) Risk Factors

<table>
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<tr>
<th>Positive Risk Factors</th>
<th>Defining Criteria</th>
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</table>
| **AGE**               | • Men > 45 years  
                        | • Women > 55 years |
| **FAMILY HISTORY**    | • Heart disease before 55 years of age in father or other male first-degree relative  
                        | • Heart disease before 65 years of age in mother or other female first degree relative |
| **CIGARETTE SMOKING** | • Each cigarette smoked increases risk of CAD |
| **HIGH BLOOD PRESSURE** | • Blood pressure ≥ 140/85 mmHg, or ≥ 130/80 mmHg for diabetics, confirmed by measurements on at least 2 separate occasions, or on anti-hypertensive medications |
| **HIGH CHOLESTEROL**  | Total cholesterol above guidelines for people with CAD (see next page) or on cholesterol lowering medications |
| **DIABETES**          | • Persons with IDDM who are > 30 years of age, or  
                        | • Persons with IDDM for > 15 years, or  
                        | • Persons with NIDDM who are > 35 years of age should be classified as patients with CAD |
| **PHYSICAL INACTIVITY** | • As defined by the combination of sedentary jobs involving sitting for a large part of the day and no regular exercise or active recreational pursuits (active <150 mins/wk) |
| **INCREASED BODY WEIGHT** | • A Body Mass Index (BMI) (kg/m²) of >27, or a male waist >102cm (Asian male >90cm) or female waist >88cm (Asian female >80cm) |
| **STRESS**            | • Behavioral Characteristics |


A RISK FACTOR may be defined as an aspect of personal behavior or lifestyle, an environmental exposure or inherited characteristic, which on the basis of scientific evidence, is known to be associated with increased risk of heart disease.

Only three risk factors are non-modifiable (Age, Gender, Family History). All other risk factors are affected by our lifestyle choices such as regular exercise, healthy eating, our coping skills with stress, and taking our medications regularly. Not all people with CAD have risk factors; most people with CAD usually have more than one risk factor. Risk factors speed up the disease process once the disease is present; our goal is to reduce our modifiable risk factors to slow the disease process.
Risk Factors we can change (modifiable):

♦ Cigarette Smoking
Smoking has been cited as the chief avoidable cause of illness and death. The risk of cardiovascular disease goes up with the number of cigarettes smoked daily and the number of years of smoking. Cigarette smoking increases the heart workload by increasing heart rate and blood pressure, decreasing oxygen transport, increasing arrhythmias, coronary artery spasm and increasing platelet adhesiveness. Cigarette smoking decreases HDL (good) cholesterol and damages the artery lining. Cigarette smoking also increases the effect of other risk factors, which increases the accelerating atherosclerotic (build up in the plumbing) process. People who continue to smoke after a heart attack have a 22% to 47 % greater risk of death or another heart attack (1). People who smoke after bypass surgery have a two-fold increase in the risk of death (1). Regardless of how long or how many cigarettes people have smoked, cessation of smoking reduces the risk of future CAD. Environmental exposure to second hand smoke causes 53,000 heart disease deaths each year in the United States (2).

♦ High Blood Pressure
In the general population, CAD risks are lowest for adults with systolic pressure (top number) below 120 mmHg and diastolic (bottom number) below 80 mmHg. The risk for CAD is greater with increases of systolic and diastolic blood pressures (>140/85). Lifestyle change including weight reduction, regular physical activity, reduction in dietary sodium (salt), and alcohol intake, and smoking cessation are recommended in addition to medication therapy.

You can take your own blood pressure reading by using a home blood pressure monitor or the ambulatory blood pressure machine at your local pharmacy. The key to taking an accurate blood pressure is being consistent in how you take it:

- Sit quietly with your back against a firm surface, your feet on the floor, and your arm supported on a table at heart level for 5 min before and during measurement.
- Use the same arm each time
- If you have one high reading, you should check it at least two more times on separate days to determine if it is consistently high
- Bring a record of your readings to your next appointment with your healthcare provider

♦ High Cholesterol
LDL (bad) cholesterol is most strongly associated with CAD risk. Studies indicate medication therapy and lifestyle changes to reduce LDL levels in individuals with CAD, reduces coronary events and death. Dietary changes, including increased fiber and
the reduction of saturated fat, cholesterol and alcohol, reductions in body weight (that are maintained), increased physical activity, cessation of smoking and medication therapy, improve cholesterol values.

**Target Cholesterol Values for Individuals with CAD:**

<table>
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<tr>
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<th>(mmol/L)</th>
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<tbody>
<tr>
<td>Total Cholesterol</td>
<td>&lt;4.5</td>
</tr>
<tr>
<td>LDL</td>
<td>&lt;2.0 or 50% from baseline</td>
</tr>
<tr>
<td>HDL</td>
<td>&gt;1.0 for men and &gt;1.3 for women</td>
</tr>
<tr>
<td>Triglycerides</td>
<td>&lt;1.7 (&lt;1.5 for diabetics)</td>
</tr>
<tr>
<td>Risk Ratio (Total Cholesterol)</td>
<td>&lt;4.0</td>
</tr>
</tbody>
</table>

**HDL**

Effect of Lifestyle Changes on LDL (bad) cholesterol, Triglycerides (TG) and HDL (good) cholesterol Level:

<table>
<thead>
<tr>
<th>Lifestyle Change</th>
<th>Major Cholesterol Benefit</th>
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<tbody>
<tr>
<td>Decreased Saturated Fats</td>
<td>↓ LDL- C, ↓ TG, ↑ HDL - C</td>
</tr>
<tr>
<td>Decreased Dietary Cholesterol</td>
<td>↑</td>
</tr>
<tr>
<td>Decreased Body Weight in Overweight</td>
<td>↑</td>
</tr>
<tr>
<td>Increased Physical Activity</td>
<td>↑</td>
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<tr>
<td>Cessation of Smoking</td>
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**Diabetes**

Individuals with diabetes over the age of 30 years are now classified as being very high risk for CAD. Control of high blood sugars and aggressive management of the other CAD risk factors is the best approach to reduce atherosclerotic progression in diabetics;

**Diabetes Management Reminders:**

- Daily aerobic exercise – follow the FITT principle:
  - Frequency – Daily – goal of 7 days per week
  - Intensity – R.P.E. of 3-6 (0-10 scale)
  - Time – 45 + minutes per day (may be accumulated in 10 min bouts)
  - Type – any aerobic activity you enjoy
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- If your blood sugars are > 16.7 mmol/L prior to exercise you will be advised not to exercise that day. Take your medications as prescribed and review with your GP regularly (keep your blood sugar log listed by date/time/exercise time).
- Regular monitoring of pre-meal blood sugars (pre-prandial – goal of 4.0-7.0 mmol/L) and post-meal blood sugars (2 hour post-prandial - goal of 5.0-10.0 mmol/L)
- Regular monitoring of blood sugars pre and post exercise sessions – especially when developing a new exercise routine
- Carry a carbohydrate snack during exercise (15 g carbohydrate) – mini juice box, lifesavers (7), glucose / dextrose tablets (3), 2 tsp honey
- Inject insulin at the abdomen site prior to exercise – do not inject into a muscle site such as the thigh prior to activity
- Regular eye exams (annual), proper foot-care and foot-wear (close-toe shoes with an arch, cushioning and lateral support and cotton socks)
- Regular Blood Pressure checks (goal BP <130/80)
- A1C readings every 3-4 months (compare with previous readings- initial target ≤7.0%)
- Annual cholesterol reading (compare with previous readings and the targets on page 10 of COACH manual)
- Maintain a healthy body weight – goal of avoiding weight gain and to maintain a Body Mass Index (BMI) of <27 & waist circumference <102 cm (male) <88 cm (female)

Visit the Canadian Diabetes Website: www.diabetes.ca

♦ Physical Inactivity
The risk of coronary artery disease (CAD) increases as physical activity decreases. Physical activity has many benefits, but specifically regular physical activity has a beneficial effect on other CAD risk factors. It has been shown to lower resting systolic and diastolic blood pressure, reduce triglycerides, increase HDL (good) cholesterol, and improve glucose tolerance and insulin sensitivity. Studies of physical activity in both animals and humans with established CAD have demonstrated slowing of atherosclerotic progression and, in some instances, regression of atherosclerosis (3)

♦ Increased Body Weight
Abdominal obesity (waist measurement greater than 102 cm in men [90 cm in Asian men] and greater than 88 cm in women [80 cm in Asian women]) or a BMI greater than 27 contribute to a high CAD risk. Analysis of increased body weight is difficult because of its association with other risk factors, such as physical inactivity, high blood pressure, high cholesterol and diabetes. Even modest weight loss of 5% -10% of initial body weight has positive benefits of CAD risk factors. Improvements in CAD risk factors are not maintained if weight is regained.

♦ Behavioral Characteristics / Coping with Stress
Type “A” personality, hostility, depression, lack of social support, chronic stress produced by situations of “high demand and low control”, and social isolation is psychosocial factors associated with CAD risk. In addition, adults who become ill suddenly or unexpectedly (cardiac patients) are likely to be highly stressed due to
changes in lifestyle, temporary limitations to work capabilities, and threats to identities. Identifying stress factors, developing social support systems and improving coping skills are important steps in reducing physical and emotional effects of stress.

REFERENCES