



## *Heart Matters:* *Primary Prevention of* *Atherosclerosis*

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Presented as the 78th Annual Dalhousie Refresher Course, 2004

Atherosclerosis is an inflammatory process that affects the intimal and medial layers of arteries and can result in thrombosis by interaction with the blood. This is a dynamic process and can, therefore, be arrested and even reversed by aggressive reduction of the risk factors which produced the vessel injury.

The recent INTERHEART study expanded the understanding of currently recognized cardiovascular risks, such as:

- smoking,
- history of diabetes,
- history of hypertension,
- psychologic factors and
- hip-waist ratio.<sup>1</sup>

Conversely, consumption of fruits and vegetables, regular exercise and moderate alcohol consumption are significantly associated with reduced risk.

### **▶ *When should a patient be screened for risk factors?***

It is suggested that screening for the presence of risk factors occur before age 20 and be repeated every five years until 40.<sup>2</sup> At 40, a global cardiovascular risk assessment should be made and repeated every five years. An assessment should be made at an earlier age if two or more risk factors have been identified.

### **▶ *Which risk assessment tool should be used?***

The most commonly used assessment tool is the Framingham risk score. The European Society of Cardiology has also developed an assessment tool which is more graphic and adjusted for populations of known lower and higher risk. North America (Eastern Canada in particular) is a high-risk population.



## ► *How can risks be reduced?*

Conventional risk factors account for 90% of the risk and altering them will intuitively reduce the risk. Individual factors must be changed as follows:

<b>Smoking</b>	Complete cessation
<b>Blood pressure</b>	140/90 mmHg [ $< 130/85$ mmHg*, 120/85 mmHg**]
<b>Dietary</b>	Fruits, vegetables, calorie intake matched to expenditure
<b>Physical activity</b>	30 minutes of daily activity
<b>Weight management</b>	Body mass index 18.5-25 kg/m <sup>2</sup>
<b>Lipid management</b>	Low-density lipoprotein $< 3.4$ mmol/L [ $< 2.5$ mmol/L]; triglycerides $< 1.5$ mmol/L

\*Patients with diabetes

\*\*Severe left ventricular dysfunction

## ► *What can be done about low HDL levels?*

A high-density lipoprotein (HDL) level of  $< 1$  mmol/L is associated with an increased risk of atherosclerosis, but there is no clear target to which HDL should be raised. Each 0.13 mmol/L increase in HDL produces an 11% decrease in 10-year cardiovascular risk. HDL should be targeted for intervention after low-density lipoprotein (LDL) targets have been reached.

Low HDL is usually associated with elevated triglycerides, hyperglycemia, obesity and hypertension (the metabolic syndrome). Lowering serum glucose to normal usually lowers triglyceride and also elevates HDL. Regular exercise and the resulting weight reduction elevate HDL. Such drugs as niacin, fibrates, estrogen and omega-3 fatty acids have a beneficial effect on HDL.

## ► *What is the role of homocysteine screening and folate therapy?*

There is no consistent evidence that homocysteine is a significantly positive predictor in individual patients. There may be some clinical value as it is applied to selected groups for additional risk assessment, such as patients who have premature coronary artery disease, stroke or venous thromboembolic disease. It may also be of value in patients who have a strong family history, but otherwise have a low-risk profile.



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### References

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2. Kavey RE, Daniels SR, Lauer RM, *et al.*: American Heart Association guidelines for primary prevention of atherosclerotic cardiovascular disease beginning in childhood. *J Pediatr* 2003; 142(4):368-72.