



# SCREENING FOR CVD RISK FACTORS

## OVERVIEW OF CVD RISK FACTORS

The following summarizes major risk factors for CVD (Coronary Artery Disease and Stroke).

### NON-MODIFIABLE:

- Age: Male  $\geq 45$  years; Female  $\geq 55$  years<sup>6</sup>
- A history of premature CVD in a first-degree family member (<55 years male and <65 years female)<sup>6</sup>

### MODIFIABLE:<sup>7</sup>

- Elevated blood pressure
- Smoking
- Sedentary lifestyle (physical inactivity)
- Stress
- Dyslipidemia
- Abdominal obesity
- Poor dietary habits
- Impaired Glucose Tolerance (IGT) or Diabetes Mellitus

### TARGET ORGAN DAMAGE:<sup>7,9</sup>

- Left ventricular hypertrophy
- Microalbuminuria or proteinuria
- Chronic Kidney Disease (CKD) (Glomerular Filtration Rate (eGFR) <60 ml/min/1.73m<sup>2</sup>)

### PRESENCE OF ATHEROSCLEROTIC VASCULAR DISEASE:<sup>7</sup>

- Known Cerebrovascular Disease; previous Stroke or TIA
- Coronary Artery Disease (CAD)
- Peripheral Vascular Disease (PVD)

## OVERVIEW OF RISK FACTORS FOR DIABETES

The following are risk factors for Diabetes which should be considered in determining the frequency of screening for adults.<sup>8</sup>

- First-degree relatives with Diabetes
- Member of high-risk population (e.g., people of Aboriginal, Hispanic, Asian, South Asian, or African descent)
- History of Impaired Glucose Tolerance (IGT) or Impaired Fasting Glucose (IFG)
- Presence of complications associated with Diabetes
- Vascular disease
- History of Gestational Diabetes Mellitus (GDM)
- History of delivery of a macrosomic infant
- Hypertension
- Dyslipidemia
- Overweight
- Abdominal obesity
- Polycystic ovary syndrome
- Acanthosis nigricans
- Schizophrenia



## SCREENING RECOMMENDATIONS

The following provides a summary of the recommended frequency of screening for adults. Risk factor screening is recommended for all males 40 years of age and older, all females 50 years of age and older or post-menopausal, and all adults with diagnosed disease (Diabetes, CKD, Stroke, CAD, PVD). Screening is also recommended in all adults with identified risk factors at any age.

Population→ Targets ↓	Adult <40 yrs with Risk Factors Adult Male ≥40 yrs Adult Female ≥50 yrs and/ or post-menopausal	Adult at High Risk* for CVD OR with CAD or PVD OR with TIA/ Stroke	Adult with ↓ eGFR or CKD OR with Diabetes Mellitus (DM)
Smoking	Identify and advise all smokers to quit at each visit.		
Physical Activity Status	Adult < 40 yrs <b>Annually</b>	Adult at high risk* <b>More frequently as indicated</b>	
BMI & Waist	Annually or as indicated	Every 3 to 6 months or as indicated	
Framingham Risk Score (FRS) for Total CVD**	Every 1 to 3 years	Classified as high risk; no FRS required	
Fasting (9-12h) Lipid Profile	Every 1 to 3 years + FRS Screen at any age in adults with major risk factors	Repeat every 1 – 4 months until target lipid levels achieved and, thereafter, every 6 to 12 months as indicated.	
Blood Pressure (BP)***	At all appropriate clinic visits  Proper BP measurement annually in persons with with borderline hypertension	Proper BP measurement every 3 to 6 months or as indicated	
FBG or HbA1c	Screen every 3 years in individuals ≥ 40 years of age	Screen earlier and/or more frequently in people with additional risk factors for diabetes	
eGFR/ACR	Screen in patients with hypertension, heart failure, First Nations people, unexplained anemia, family history of end-stage renal disease, autoimmune disease, and edema	Annually or as indicated	
Edinburgh Claudication Questionnaire**** & Physical Exam	Annually		

\*High risk is defined as a 20% or greater 10-year risk of CAD-related death or non-fatal MI and as determined by the Framingham Risk Score for Total CVD.

\*\*Framingham Risk Score for Total CVD (see Appendix A)

\*\*\* Recommended Technique for Office Blood Pressure Measurement (see page 15)

\*\*\*\* Edinburgh Claudication Questionnaire (see page 65)

ACR = Albumin to Creatinine Ratio

BMI = Body Mass Index

BP = Blood Pressure

CAD = Coronary Artery Disease

CKD = Chronic Kidney Disease

CVD = Cardiovascular Disease

DM = Diabetes Mellitus

eGFR = Estimated Glomerular Filtration Rate

FBG = Fasting Blood Glucose

FRS = Framingham Risk Score for Total CVD

MI = Myocardial Infarction

PVD = Peripheral Vascular Disease

TIA = Transient Ischemic Attack



## THE FRAMINGHAM RISK SCORE FOR TOTAL CVD

The Framingham Risk Score (FRS) for total CVD is a key tool in determining the most appropriate treatment target for managing cholesterol.<sup>37</sup> Use of the risk assessment tool (see Appendix A) has been shown to increase adherence to therapeutic measures. The FRS is applicable to a large percentage of the Canadian population and provides a reasonable estimate of the 10-year risk of a major CVD (cardiovascular death, nonfatal myocardial infarction, and stroke as a combined end point, and total mortality as a secondary end point). This tool is designed to estimate risk in adults who do not have CAD.

The risk factors included in the Framingham calculation are age, total cholesterol, HDL-C, systolic blood pressure, treatment for hypertension, cigarette smoking, and Diabetes. Because of a larger database, Framingham estimates are more robust for total cholesterol than for LDL cholesterol; however, **LDL cholesterol remains the primary target of therapy.**

- **Low risk** is defined as a 10-year CAD related death or non-fatal MI risk less than 10%.
- **Moderate risk** is defined as a 10-year risk of 10% to 20%.
- **High risk** is defined as a 10-year risk over 20%.

### WHO SHOULD BE SCREENED?

Screen with a full lipid profile and the Framingham Risk Score for Total CVD every 1 to 3 years for the following:

- All males  $\geq 40$  years and all women  $\geq 50$  years or who are post-menopausal.

In addition, adults with the following risk factors should be screened at any age:

- Diabetes Mellitus;
- Current or recent (within the past year) cigarette smoking;
- Hypertension;
- Abdominal obesity - waist circumference  $>102$  cm for men and  $>88$  cm for women (lower cut-offs are appropriate for South and East Asians);
- A body mass index (BMI) of greater than  $27 \text{ kg/m}^2$  (overweight) or greater than  $30 \text{ kg/m}^2$  (obese);<sup>37</sup>
- Autoimmune chronic inflammatory conditions such as rheumatoid arthritis, SLE, and psoriasis;<sup>37</sup>
- Patients with chronic HIV infection;<sup>37</sup>
- Family history of premature Coronary Artery Disease (CAD);
- Stigmata of hyperlipidemia (eg, xanthoma);
- Exertional chest discomfort, dyspnea, erectile dysfunction, claudication, Chronic Kidney Disease; or,
- Evidence of atherosclerosis.

Screen children who have a family history of severe hypercholesterolemia or chylomicronemia.

Other patients may be screened at the discretion of their physician, particularly when lifestyle changes are indicated.

## METABOLIC SYNDROME

Metabolic syndrome incorporates many of the risk factors considered in the calculation of the Framingham Risk Score for Total CVD along with other risk factors. Individuals who meet the definition of metabolic syndrome by the criteria listed below are often at higher risk than estimated by the Framingham Risk Score for Total CVD and additional investigations (e.g., Lp(a), Apo B, hsCRP) may be appropriate to further define short-term risk and/ or the need for more aggressive management of existing risk factors.<sup>9</sup>

**CRITERIA USED TO DEFINE METABOLIC SYNDROME** (three or more of the following<sup>9</sup>):

Risk Factor	Defining Level
<b>Abdominal obesity</b> Men Women	Waist circumference $>102$ cm (40") $>88$ cm (35") See next page for ethnic specific values
<b>Triglycerides</b>	$\geq 1.7$ mmol/L
<b>High-density lipoprotein cholesterol (HDL-C)</b> Men Women	$<1.0$ mmol/L $<1.3$ mmol/L
<b>Blood pressure</b>	$>130/85$ mmHg
<b>Fasting glucose</b>	$5.7 - 7.0$ mmol/L



## RACIAL/ ETHNIC POPULATIONS

The risk rates for CAD vary among ethnic groups in Canada. Individuals of South Asian ancestry have been found to be at the highest risk of developing CAD and other vascular diseases.<sup>10,11</sup> The higher risk among South Asians is partly explained by an increased prevalence of abdominal obesity, glucose intolerance, hyper-triglyceridemia, low HDL-C levels, and elevated levels of Lp(a). Individuals of First Nations ancestry are also at markedly increased risk for Diabetes and CAD.<sup>12</sup> Individuals of South Asian, Chinese, and Japanese descent have lower cut-off points for waist measurement.<sup>7, 8,10</sup>

### WAIST CIRCUMFERENCE CUT-OFFS BY ETHNICITY

Criteria	Men (cm)	Women (cm)
ATP III criteria*	> 102	> 88
Europids (white people of European origin, regardless of where they live in the world)	≥ 94	≥ 80
South Asians	≥ 90	≥ 80
Chinese	≥ 90	≥ 80
Japanese**	≥ 90	≥ 80

Adapted from the Criteria for Abdominal Obesity as Proposed by the IDF Consensus Committee on the Metabolic Syndrome<sup>13</sup>

ATP III = Adult Treatment Panel III

\* ATP III values for waist circumference continue to be the most common values used for clinical purposes; however, for white people of European origin, regardless of where they live in the world, the risk of CVD increases when the waist circumference rises above 94 cm in men and 80 cm in women<sup>6, 9, 13, 14</sup>

\*\* There is a lack of agreement about ideal waist cut-off points for Japanese; however, the best agreement with CVD and Diabetes risk factors are 90 cm for males and 80 cm for females.<sup>34</sup>

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