Primary Prevention of Cardiovascular Disease in Adults: Clinical Decision Support Tool

Two Canadian guidelines provide recommendations about dyslipidemia management to assess cardiovascular risk and prevent cardiovascular disease (CVD) in adults:

- Canadian Cardiovascular Society (CCS) Dyslipidemia Guidelines (1)
- Patient, Experience, Evidence, Research (PEER) simplified lipid guidelines (2, 3)

Many CCS and PEER recommendations are similar; however, some PEER recommendations are discordant with CCS recommendations (4), as well as international guidelines (5,6), creating confusion among healthcare providers and patients.

This tool highlights key CCS Dyslipidemia Guidelines recommendations for the primary prevention of CVD including:

- Lp(a) screening once in a person's lifetime
- ApoB to determine cardiovascular risk when TG > 1.5 mmol/L
- Repeat lipid testing for all adults on statins
- Use of non-statin lipid-lowering drugs with patients unable to achieve lipid thresholds with initial statin therapy

Primary care clinicians may wish to expand their practice beyond the PEER guidelines to include CCS recommendations in primary prevention care.

Step 1: Screen

Who to screen:

- Men and women > 40 years of age (earlier in groups at increased risk such as South Asian or Indigenous people)
- Postmenopausal women
- People at any age with conditions in Table 1.

Who not to screen:

- Adults with a condition where a statin is indicated including:
  - Documented ASCVD conditions[1]
  - Diagnosed familial hypercholesterolemia
  - Most patients with diabetes[2], chronic kidney disease[3], and LDL-C ≥ 5.0 mmol/L[4]

Table 1. Screen adults at any age with:

- Clinical evidence of atherosclerosis
- Abdominal aortic aneurysm
- Diabetes mellitus
- Arterial hypertension
- Current cigarette smoking
- Stigmata of dyslipidemia (corneal arcus, xanthelasma, xanthoma)
- Family history of premature CVD
- Family history of dyslipidemia
- Chronic kidney disease
- Obesity (BMI ≥ 30)
- Inflammatory diseases
- HIV infection
- Erectile dysfunction
- COPD
- History of hypertensive disorder of pregnancy

How to screen:

- History and physical exam
- Standard lipid profile: TC, LDL-C, HDL-C, non-HDL-C, TG
- FPG or A1c
- Lp(a) – once in an adult's lifetime

Optional:

- ApoB
- Urine ACR (if eGFR < 60 mL/min/1.73 m^2, hypertension, or diabetes)

Lp(a) is a genetically inherited lipoprotein that increases the risk of ASCVD. A person's Lp(a) level cannot be deduced from other lipid markers or ApoB. Direct measurement of Lp(a) informs cardiovascular risk assessment for all adults but is especially important for younger people with a strong family history of premature CVD.

ApoB is the optimal measurement to inform atherogenic risk assessment when TG > 1.5 mmol/L. Even modest elevation of TG lowers LDL-C resulting in undertreatment if LDL-C alone is used to determine atherogenic risk. Non-HDL-C may also be used to provide a more accurate assessment of the total concentration of atherogenic particles than LDL-C in adults with TG > 1.5 mmol/L.

Step 2: Assess Risk

Calculate cardiovascular risk.
Use a validated risk assessment tool (e.g., Framingham Risk Score, or another validated calculator).

[1] Includes acute coronary syndrome, myocardial infarction, stable or unstable angina, coronary artery disease on angiography, coronary or other arterial revascularization, stroke, transient ischemic attack, documented carotid disease, peripheral artery disease, and abdominal aneurysm.
[2] Age ≥ 40 years or age ≥ 30 years and DM ≥ 15 years duration or microvascular disease
[3] Age ≥ 50 years and eGFR < 60 mL/min/1.73m^2 or ACR > 3mg/mmol
[4] or ApoB ≥ 1.45g/L or non-HDL-C ≥ 5.8 mmol/L

Step 3: Shared Decision-Making to Manage Risk

Discuss health behaviour modifications with all adults.
• Smoking cessation • Heart healthy eating • Exercise

Recommend statin therapy to adults with:

Low-Risk FRS < 10% and	Intermediate-Risk FRS = 10-19.9% and	High-Risk FRS ≥ 20%
(a) LDL-C ≥ 5.0 mmol/L (or non-HDL-C ≥ 5.8 mmol/L or ApoB ≥ 1.45 g/L) or (b) FRS 5%-9.9% with LDL-C ≥ 3.5 mmol/L (or non-HDL-C ≥ 4.2 mmol/L or ApoB ≥ 1.05 g/L), particularly with other risk modifiers (e.g., family history, Lp(a) ≥ 50 mg/dL [or ≥100 nmol/L] or CAC > 0 AU).	LDL-C ≥ 3.5 mmol/L (or non-HDL-C ≥ 4.2 mmol/L or ApoB ≥ 1.05 g/L) or Men ≥ 50 years and women ≥ 60 years with one additional risk factor (low HDL-C, IFG, high waist circumference, smoker, or hypertension) or presence of other risk modifiers (e.g., hsCRP ≥ 2.0 mg/L, CAC >0 AU, family history of premature CAD, Lp(a) ≥ 50 mg/dL [or ≥ 100 nmol/L]).	

Step 4: Monitor

When statin treatment is not indicated, repeat screening every 5 years up to 75 years of age.

For adults on statins, repeat the lipid profile to monitor response to treatment.

Repeat testing for all adults indicates if treatment is being used and is adequate, or may require modification or intensification.

- **Discuss add-on therapy if LDL-C ≥ 2.0 mmol/L (or ApoB ≥ 0.8 g/L or non-HDL-C > 2.6 mmol/L) on maximally tolerated statin dose. Use ezetimibe as first line (BAS as alternative).**

Non-statin add-on therapy lowers cardiovascular risk in adults who don't achieve sufficient LDL-C lowering on the maximally tolerated statin dose.

Step 5: Refer/Consult

Consider involving a specialist if further tests and interventions are warranted.

Examples:

When a person is…

- **Eligible but reluctant to start or continue with statin therapy.**
- **Unable to achieve their treatment goals with maximally tolerated statins because of intolerance or inadequate lowering of LDL-C.**
- **On statins with TG > 1.5 mmol/L despite achieving LDL-C thresholds.**
- **Pregnant, lactating, or planning pregnancy.**

A1c = glycated hemoglobin; ACR = albumin-to-creatinine ratio; ApoB = apolipoprotein B; ASCVD = atherosclerotic cardiovascular disease; BAS = bile acid sequestrants; BMI = body mass index; CAC = coronary artery calcium; COPD = chronic obstructive pulmonary disease; CVD = cardiovascular disease; DM = diabetes mellitus; eGFR = estimated glomerular filtration rate; FPG = fasting plasma glucose; HDL-C = high-density lipoprotein cholesterol; HIV = human immunodeficiency virus; hsCRP = high-sensitivity C-reactive protein; IFG = impaired fasting glucose; LDL-C = low-density lipoprotein cholesterol; Lp(a) = lipoprotein(a); TC = total cholesterol; TG = triglycerides

References

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Visit us at **CCS.CA** or scan the QR code to access the CCS 2021 Dyslipidemia Guidelines and Resources webpage

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