

## Guideline for Adult Lipid Testing

CLP - 017

Revised March 17, 2008

(Replaces August, 2007 Revision)

### 1. Background

The OAML's Guideline for Adult Lipid Testing has been revised to be consistent with the Canadian Cardiovascular Society's position statement, "Recommendations for the diagnosis and treatment of dyslipidemia and prevention of cardiovascular disease," published in September, 2006 (Primary Document)<sup>1</sup>. Clinicians are encouraged to consult the Primary Document for more detailed interpretation.

Laboratory testing guidelines generally will not apply to every clinical situation, nor can they serve as a substitute for sound clinical judgment.

### 2. Lipid Assessment

Assessment of dyslipidemia includes the following tests: total cholesterol (TC), high density lipoprotein cholesterol (HDL-C), triglycerides (TG), low density lipoprotein cholesterol (LDL-C) and a TC: HDL-C ratio. These tests can be ordered by checking "Lipid Assessment" on the revised (August, 2007) OHIP laboratory requisition. Samples for these Lipid Assessment tests must be drawn after patients have been fasting (water only) for a minimum of 12 hours.

### 3. Ten Year Risk for the Development of Cardiovascular Disease

Ten year risk is defined as the probability of a subgroup of the population developing cardiovascular disease (CVD) within a 10 year period, if not treated. Assessment of this risk is determined by stratification of patients using clinical and laboratory data entered into the Framingham Risk Score Tool (available at [www.oaml.com](http://www.oaml.com)).

Listed below are some of the demographic and/or clinical states that confer increased risk of CVD:

- smoking
- \*male and over age 40
- \*women who are post-menopausal or over age 50
- abdominal obesity-waist circumference in males > 102 cm (40 inches) and in women > 88 cm (35 inches)
- individuals (including children) with a family history of familial hypercholesterolemia or chylomicronemia
- diabetes mellitus, and/or hypertension
- individuals having strong family history, especially a first degree relative, of premature CVD (males < 55 years; female < 65 years); risk scores for such individuals as calculated by the Framingham Risk Score Tool are to be multiplied by 2.0.
- physical manifestations of hyperlipidemia such as xanthelasma, xanthoma, and/or arcus corneae
- evidence of atherosclerosis, chronic kidney disease, or systemic lupus erythematosus
- patients for whom lifestyle changes are indicated.

\*Individuals of any age may be assessed for clinical risk of CVD at the discretion of the practitioner.

#### 4. Limitations of Risk Assessment Tools

It is important to note that the risk engine tools of both the Framingham Study and the United Kingdom Prospective Diabetes Study underestimates CVD risk in patients with diabetes mellitus. Patients with diabetes mellitus have an extremely high long-term risk of CVD and early intervention is indicated, even if the calculated 10 year risk does not suggest it. <sup>1</sup>

#### 5. Risk Categories and Target Lipid Levels

**Please note this Guideline has been revised to be consistent with Canadian Cardiovascular Society’s position statement, “Recommendations for the diagnosis and treatment of dyslipidemia and prevention of cardiovascular disease,” published in September, 2006.** This Guideline now outlines treatment initiation levels rather than treatment targets for patients assigned to moderate and low risk strata.

For patients in the high risk category, the primary therapeutic goal is to lower LDL-C to the stated treatment target (< 2.0 mmol/L). A secondary goal is to achieve the stated TC/HDL-C ratio (<4.0) when this is clinically possible. For patients in the moderate and low risk strata, treatment should be initiated based on either elevated LDL-C or elevated TC/HDL-C (see table below). Again, these are not treatment targets - they are treatment initiation levels. When treatment is indicated for these patients, the objective is to lower the LDL-C by at least 40%, usually to LDL-C < 2.5 mmol/L for the moderate risk patients and to <3.5 mmol/l for the low risk patients.

Risk category (calculated by using Framingham Risk Engine Tool-see section 3)	10-year risk for CVD	Recommendations	Supplemental Test *Apolipoprotein B Optimal plasma level
<b>High</b> Includes patients with diabetes, atherosclerotic disease, renal failure	≥20%	<b>Treatment Targets</b> Primary LDL-C <2.0 mmol/L  Secondary TC/HDL-C <4.0	Apolipoprotein B <0.85 g/L
<b>Moderate</b>	10%-19%	<b>Treatment Initiation</b> LDL-C ≥3.5 mmol/L <b>OR</b> TC/HDL-C ≥ 5.0	Apolipoprotein B <1.05 g/L
<b>Low</b>	<10%	<b>Treatment Initiation</b> LDL-C ≥5.0 mmol/L <b>OR</b> TC/HDL-C ≥6.0	Apolipoprotein B <1.2 g/L

\*Apolipoprotein B is a recommended supplemental test used to monitor patients treated with statins<sup>1</sup>.

#### 6. Other Laboratory Measurements

The following tests, which are not included in the “Lipid Assessment” (see section 2), are now recognized as independent modifiers of CVD risk. Elevated levels (see below) indicate an increased risk of CVD. Clinicians are encouraged to consult the Primary Document for a more detailed interpretation.

- Lipoprotein (a) [Lp(a)] > 0.30 g/L (serum)
- High sensitivity C-reactive protein (hs-CRP) > 3.0 mg/L (serum)
- Homocysteine >20 umol/L (plasma)
- Apolipoprotein B (Apo B): (see section 5)
- Triglycerides (see section 7)

## 7. Treatment of Hypertriglyceridemia

The Primary Document states that treatment to lower serum triglyceride levels (to decrease the significant risk of pancreatitis) should be initiated if fasting triglyceride levels are greater than 10 mmol/L.

The Canadian Cardiovascular Society recommends that if the fasting serum concentration of triglycerides exceeds 1.15 mmol/L, therapy should be initiated with the goal of attaining the LDL-C target specified for the patient's risk stratum for CVD<sup>2</sup> (< 2.0, <2.5 and <3.5 mmol/L for high, moderate, and low-risk patients, respectively).

## 8. Monitoring Treatment

The recommended frequency of testing at initiation of treatment ("Initially") and to monitor treatment(s) ("Subsequently") for dyslipidemia is as follows:

For patients on diet therapy only	For patients on diet and drug therapy
Testing should include the lipid assessment (described in section 2).	Testing should include lipid assessment (described in section two). Where statins are used, ALT and CK should be tested to monitor potential toxic side effects. Apo B may also be used to monitor adequacy of treatment.
Initially: every 3-6 months up to one year.	**Initially : baseline, at 2-3 months and at 6 months.
Subsequently: every 6-12 months.	Subsequently: every 6-12 months.

\*\*Some physicians choose to monitor more frequently during the initiation of statin therapy

If there is clinical or laboratory evidence of side effects due to medications, a clinical reassessment of the patient including a risk-benefit analysis should be undertaken. If a decision is made to continue with drug therapy, more frequent monitoring is indicated. Frequency of monitoring is dependant on the severity of symptoms and/or the degree of chemical abnormality.

## 9. Cited References

1. McPherson, R., Frohlich, J. Fodor, G., Genest, J. Canadian Cardiovascular Society position statement - Recommendations for the diagnosis and treatment of dyslipidemia and prevention of cardiovascular disease. Can J Cardiol September, 2006; 22:913-27.
2. Yuan, G., Al-Shali, K.Z., Hegele R. Hypertriglyceridemia: its etiology, effects and treatment. CMAJ April, 2007; 176(8):1113-20.

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#### Warning & Disclaimer

This Guideline was prepared to assist clinicians who order tests from community laboratories. Users must ensure that their own practices comply with all specific government policies and specific legislative and accreditation requirements that apply to their organizations. The Guideline is not meant to be construed as legal advice or be all inclusive on this topic. Given the complexity of legal requirements, users are reminded that whenever there is uncertainty regarding whether some aspect of a Guideline is appropriate for their practice or organization, further direction should be obtained from the Laboratory Director, their own professional association, college and/or legal counsel or appropriate government ministry.