Dyslipidemia:
Optimizing Outcomes

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The current management of dyslipidemia requires attention to the patient's underlying cardiovascular risk and lipid disorder, a knowledge of treatment options and long-term followup of the patient.

Principles of therapy

#1 Assessment of risk

The Canadian Working Group on Dyslipidemias recommends using the Framingham risk model in a patient without diabetes or cardiovascular disease in order to develop cholesterol targets for treatment. Individuals with diabetes or known disease are placed in the high-risk subgroup and must be treated aggressively.

#2 Secondary causes

A number of secondary causes of dyslipidemia exist, including:

- pathologies
- lifestyle-related factors and
- medication-related causes (Table 1).

Janice's Situation

- Janice, 62, appears for lipid assessment and treatment.
- She was diagnosed with hypercholesterolemia six months ago, and a lifestyle treatment was initiated.
- She is currently receiving an ARB and hydrochlorothiazide for hypertension.
- Her brother had an MI at age 62.
- Janice is a smoker.
- Height: 157 cm
- Weight: 83 kg
- Waist circumference: 94 cm
- BMI: 33.7
- BP: 129/88 mmHg
- TC: 6.2 mmol/L
- HDL: 0.7 mmol/L
- LDL: 3.5 mmol/L
- TG: 4.4 mmol/L
- TC/HDL: 8.9 mmol/L
- FBG: 6.1 mmol/L
- TSH: 4.9 mIU/L

How can you help Janice? Go to page 106 to find out.

ARB: Angiotensin receptor blocker
MI: Myocardial infarction
BMI: Body mass index
BP: Blood pressure
TC: Total cholesterol
HDL: High-density lipoprotein
LDL: Low-density lipoprotein
TG: Triglyceride
FBG: Fasting blood glucose
TSH: Thyroid-stimulating hormone

Table 1

Secondary causes of dyslipidemias

Pathologies	TC	LDL	HDL	TG	Apo B
Hypothyroid	↑	↑	N	N/↑	↑
Nephrotic syndrome	↑	↑	N	N/↑	↑
Cholestasis	↑	(↑)	↑	N/↑	↑
Diabetes	N/↑	N	↓	↑	↑
Kidney failure	N	N	↓	↑	↑
Lifestyle	**TC**	**LDL**	**HDL**	**TG**	**Apo B**
Metabolic syndrome (genetic predisposition)	N/↑	N/↑	↓	↑	↑
Smoking	N/↑	N/↑	↓	N/↑	N/↑
Physical inactivity	N/↑	N/↑	↓	N/↑	N/↑
Diet rich in free fatty acid, sugar, calories and alcohol	↑	↑↑	↑	N	↑
Common medications	**TC**	**LDL**	**HDL**	**TG**	**Apo B**
Estrogen	N/↑	↓	↑↑	↑	N/↑
Progestin	↑	↑	↓	↓	↑
Corticosteroids	↑	N	↓	↑↑↑	N/↑
Thiazides	N/↑	↑	↓	↑	↑
Beta blockers without ISA	N/↑	N	↓	↑	N(?)
Beta blockers with ISA	N	N	N	N	N

TC: Total cholesterol LDL: Low-density lipoprotein HDL: High-density lipoprotein TG: Triglyceride
Apo B: Apolipoprotein B ISA: Intrinsic sympathomimetic activity

#3 Goal setting

Current treatment goals as outlined in the current Canadian Recommendations are indicated in Table 2.[1]

#4 Non-pharmacologic and pharmacologic intervention

Non-pharmacologic intervention includes exercise and weight control, smoking cessation and dietary intervention. Pharmacologic intervention is based on the patient's lipid disorder, the profile of the agent selected, the magnitude of reduction desired and the ability of the patient to adhere to the recommended therapy.

At times, combination therapies may be required. Statins have clearly demonstrated reductions in both cardiovascular and total mortality, as well as reductions in other vascular outcomes in a broad array of patient populations. Recent evidence suggests a benefit to lowering LDL-C to below 2.5 mmol/L in high-risk patients.

Patients with combined dyslipidemia and low

Table 2

Cholesterol targets based on patient risk

Risk category	LDL target (mmol/L)	TC/HDL-C ratio target
High* (10-year risk of coronary artery disease ≥ 20%, or history of diabetes mellitus or any atherosclerotic disease)	< 2.5	< 4.0
Moderate (10-year risk, 11% to 19%)	< 3.5	< 5.0
Low (10-year risk ≤ 10%)	< 4.5	< 6.0

LDL-C: Low-density lipoprotein cholesterol
TC: Total cholesterol
HDL-C: High-density lipoprotein cholesterol

*Apolipoprotein B can be used as an alternative measurement, particularly for follow-up of patients treated with statins. An optimal level of apolipoprotein B in a patient at high risk is < 0.9 g/L, <1.05 g/L in a patient at moderate risk and <1.2 g/L in a patient at low risk.

high-density lipoprotein (HDL) may require the use of combination therapy. Both niacin and fibrates have been demonstrated to increase HDL and their efficacy has been established in the HDL—Atherosclerosis Treatment Study trial, in which niacin was used in combination with simvastatin and gemfibrozil when used alone in patients with low HDL. In patients who require principal LDL reduction and cannot achieve optimal levels with statins alone, or can only tolerate low-dose statins, statin/ezetimibe or statin/resin may provide benefit.

#5 Appropriate followup

Followup is necessary to ensure that cholesterol levels are adequately altered to achieve therapeutic targets, to ensure the safety of therapy, as well as to ensure that patients remain adherent to therapy.

In general, the lipid profile should be reassessed six to 12 weeks after initiating a new regimen. Once targets are achieved, the lipid profile should be assessed every six to 12 months. In general, liver enzymes should be checked twice yearly. In patients on single drug therapy, creatine kinase (CK) should generally only be checked in patients exhibiting myalgias; however, if the patient is on a statin-fibrate combination, CK should be considered at the same time as the lipid profile. As combination statin-fibrate therapy carries a risk of myopathy approximately tenfold higher than that of a statin alone, patients should be made aware of symptoms that are warning signs of rhabdomyolysis. The combination of statin/fenofibrate is a safer alternative than statin/gemfibrozil.

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Back to Janice

- Janice suffers from metabolic syndrome, is hypothyroid and overweight. Her calculated 10-year risk exceeds 30%, thus necessitating goals of LDL < 2.5 mmol/L and a TC/HDL < 4 mmol/L.
- She has several secondary causes of dyslipidemia, including smoking, hypothyroidism and metabolic syndrome. She must be provided direction in smoking cessation and lifestyle change (exercise and diet); thyroid supplementation should be initiated.
- Due to her risk level, Janice should be started on a statin immediately, with consideration of the addition of either a fibrate or niacin in approximately six months, depending on her response to thyroid supplementation and lifestyle changes.

Long-term adherence is also an important issue to consider. Unfortunately, numerous databases indicate that one- and two-year adherence rates for statins hover around the 40% to 50% mark and are dependant upon whether the patient has suffered an initial event or not and the number of medications the patient is taking.

Therefore, 50% of patients initiated on statins don't take these agents long enough to derive significant benefit from them. Given the above, it is important, at a minimum, to indicate to patients that cholesterol-lowering therapy is considered a long-term therapy.

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