Society Guidelines

2012 Update of the Canadian Cardiovascular Society Guidelines for the Diagnosis and Treatment of Dyslipidemia for the Prevention of Cardiovascular Disease in the Adult

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# Agenda

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<td>Who to screen &amp; risk assessment</td>
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<td>Levels of Risk</td>
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<tr>
<td>Secondary testing</td>
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<td>Behavioural recommendation</td>
</tr>
<tr>
<td>Statin intolerance</td>
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</tbody>
</table>
Changes since 2009

- GRADE recommendations
- Addition of CKD definitions and treatment
- Recommending more frequent monitoring for those with FRS ≥ 5%
- Lower age for treatment in diabetes – CDA harmonization
- Addition of non-HDL –C as alternative target
- Recommendation for secondary testing in selected patients
- More explicit recommendations for health behaviour changes
- Statin intolerance approach
- Cardiovascular Age determination
Lipid profile screening

Men ≥ 40 years of age, and women ≥ 50 years of age or postmenopausal

All patients with the following conditions, regardless of age:

- Current cigarette smoking
- Diabetes
- Arterial hypertension
- Family history of premature CVD (< 55 years in men and 65 years in women)
- Family history of hyperlipidemia
- Erectile dysfunction
- Moderate renal function impairment (eGFR < 60mL/min/1.73 m²) or urinary albumin:creatinine > 3 mg/mmol (micro-albuminuria)
- Inflammatory disease (rheumatoid arthritis, systemic lupus erythematosus, psoriatic arthritis, ankylosing spondylitis, inflammatory bowel disease)
- HIV infection
- Chronic obstructive pulmonary disease
- Abdominal aneurysm
- Evidence of atherosclerosis
- Clinical manifestation of hyperlipidemia (xanthomas, xanthelasmas, premature arcus cornealis)
- Obesity (metabolic syndrome, pre-diabetes, polycystic ovarian syndrome, BMI > 27 kg/m²)
Risk assessment

1. We recommend that a **cardiovascular risk assessment** using the “10 Year Risk” provided by the **Framingham** model be completed every 3 to 5 years for men age 40 to 75, and women age 50 to 75. This should be modified (percent risk doubled) when **family history** of premature CVD is positive (i.e. 1st relative <55 years for men; <65 years for women). A risk assessment may also be completed whenever a patient’s expected risk status changes. Younger individuals with ≥1 risk factor for premature CVD may also benefit from a risk assessment to motivate them to improve their lifestyle.

*(Strong Recommendation, Moderate-quality Evidence)*
Limitations of 10 year risk estimates

- Sensitive to the patient’s age
- Majority of individuals identified as being at low risk
- More accurate among younger individuals
- Competing risk increases with age (i.e. cancer)
- Risk categories (low, inter., high) chosen arbitrary by consensus
- Sub-optimal understanding and use

Despite the limitations assessing total CVD risk improves management of blood pressure and blood lipids
Adherence to Statins is Sub-Optimal Among Canadians

Figure. Survival Curves for Adherence With Statins in 3 Cohorts

Risk assessment

2. We recommend calculating and discussing a patient’s “Cardiovascular Age” to improve the likelihood that patients will reach lipid targets and that poorly controlled hypertension will be treated. *(Strong Recommendation, High-Quality Evidence)*

Values and preferences:
The primary evaluation of risk is the modified 10 year Framingham Risk Score (FRS). Given the overlap in risk factors for diabetes. A simultaneous evaluation of cardiometabolic risk for diabetes may be useful to motivate lifestyle changes. It is well known that a 10 year risk does not fully account for risk in younger individual. In these individuals, the calculation of a Cardiovascular Age has been shown to motivate subjects to achieve risk factor targets.
# 2012 CCS Dyslipidemia Guidelines Update

## Cardiovascular Age Tables

<table>
<thead>
<tr>
<th>Blood Pressure (mmHg)</th>
<th>Total Cholesterol: HDL Ratio</th>
<th>Male</th>
<th>Smokers</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Diabetes: NO</strong></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td><strong>Non-Smokers</strong></td>
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<tr>
<td></td>
<td><strong>Total Cholesterol: HDL Ratio</strong></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td><strong>Male</strong></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td><strong>Smokers</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>120/80</td>
<td>28.1</td>
<td>33.1</td>
<td>120/80</td>
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<tr>
<td>130/85</td>
<td>29.1</td>
<td>34.2</td>
<td>130/85</td>
</tr>
<tr>
<td>140/90</td>
<td>30.0</td>
<td>35.3</td>
<td>140/90</td>
</tr>
<tr>
<td>150/95</td>
<td>31.0</td>
<td>36.4</td>
<td>150/95</td>
</tr>
<tr>
<td><strong>Age 30</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>120/80</td>
<td>37.3</td>
<td>42.2</td>
<td>120/80</td>
</tr>
<tr>
<td>130/85</td>
<td>38.2</td>
<td>43.3</td>
<td>130/85</td>
</tr>
<tr>
<td>140/90</td>
<td>39.2</td>
<td>44.3</td>
<td>140/90</td>
</tr>
<tr>
<td>150/95</td>
<td>40.1</td>
<td>45.4</td>
<td>150/95</td>
</tr>
<tr>
<td><strong>Age 40</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>120/80</td>
<td>47.1</td>
<td>51.7</td>
<td>120/80</td>
</tr>
<tr>
<td>130/85</td>
<td>47.9</td>
<td>52.7</td>
<td>130/85</td>
</tr>
<tr>
<td>140/90</td>
<td>48.8</td>
<td>53.7</td>
<td>140/90</td>
</tr>
<tr>
<td>150/95</td>
<td>49.7</td>
<td>54.6</td>
<td>150/95</td>
</tr>
<tr>
<td><strong>Age 50</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>120/80</td>
<td>57.4</td>
<td>61.5</td>
<td>120/80</td>
</tr>
<tr>
<td>130/85</td>
<td>58.2</td>
<td>62.4</td>
<td>130/85</td>
</tr>
<tr>
<td>140/90</td>
<td>59.0</td>
<td>63.2</td>
<td>140/90</td>
</tr>
<tr>
<td>150/95</td>
<td>59.8</td>
<td>64.0</td>
<td>150/95</td>
</tr>
<tr>
<td><strong>Age 60</strong></td>
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<tr>
<td>120/80</td>
<td>68.2</td>
<td>71.4</td>
<td>120/80</td>
</tr>
<tr>
<td>130/85</td>
<td>68.8</td>
<td>72.1</td>
<td>130/85</td>
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<tr>
<td>140/90</td>
<td>69.5</td>
<td>72.7</td>
<td>140/90</td>
</tr>
<tr>
<td>150/95</td>
<td>70.1</td>
<td>73.3</td>
<td>150/95</td>
</tr>
<tr>
<td><strong>Age 70</strong></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>120/80</td>
<td>71.4</td>
<td>72.7</td>
<td>120/80</td>
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<tr>
<td>130/85</td>
<td>72.1</td>
<td>73.0</td>
<td>130/85</td>
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<tr>
<td>140/90</td>
<td>72.7</td>
<td>73.6</td>
<td>140/90</td>
</tr>
<tr>
<td>150/95</td>
<td>73.3</td>
<td>74.6</td>
<td>150/95</td>
</tr>
</tbody>
</table>
Low risk recommendations

1. Pharmacotherapy with LDL-C $\geq 5.0$ mmol/L, or evidence of genetic dyslipidemia (e.g. familial hypercholesterolemia) \textit{(Strong Recommendation, Moderate-Quality Evidence)}.

2. $\geq 50\%$ reduction of LDL-C after treatment is initiated \textit{(Strong Recommendation, Moderate-Quality Evidence)}

Values and preferences: Unchanged. Less clinical trial evidence, so practice will vary and depend on patient wishes and clinical evaluation.

For subjects with 5-9\% risk:
- more frequent monitoring of risk
- discuss risks/benefits of statin therapy
- judicious use of secondary testing.
Intermediate Risk Recommendations

1. IR category: adjusted $\text{FRS} \geq 10\%$ and $<20\%$
   (Strong Recommendation, Moderate-Quality Evidence).

2. Treat IR individuals with $\text{LDL-C} > 3.5 \text{ mmol/L}$
   (Strong Recommendation, Moderate-Quality Evidence).

3. In IR individuals with $\text{LDL-C} < 3.5 \text{ mmol/L}$, $\text{apo B} \geq 1.2 \text{ g/L}$ or $\text{non-HDL-C} \geq 4.3 \text{ mmol/L}$ can help identify patients to benefit from pharmacotherapy
   (Conditional Recommendation, Moderate-Quality Evidence).

4. Target $\text{LDL-C} \leq 2.0 \text{ mmol/L}$ or $\geq 50\%$ reduction once treatment is initiated
   (Strong Recommendation, Moderate-Quality Evidence).
   Alternative targets: $\text{apo B} \leq 0.8 \text{ g/L}$ or $\text{non-HDL cholesterol} \leq 2.6 \text{ mmol/L}$
   (Conditional Recommendation, Moderate-Quality Evidence).
Intermediate risk and non-HDL: values and preferences

- Adding non-HDL-C would seem to contradict the philosophy of simplifying the guidelines.
- However, apo B is not available in some jurisdictions, while non-HDL-C is available without any additional cost or testing.
- Also, increasing data demonstrate its potential advantages over LDL-C: superior risk predictor, fasting not required.
- Therefore, it was decided to increase its profile in the guidelines. Non-HDL-C would be particularly useful where apo B is unavailable and where TG $\geq$ 1.5 mmol/L.
High risk recommendations

1. High risk is defined in those subjects who have clinical atherosclerosis, diabetes >15 years duration and age >30 years, or age >40 years with diabetes or the presence of microvascular disease, or adjusted Framingham Risk Score of ≥20%.
   *(Strong Recommendation, High-Quality Evidence).*

   We now include abdominal aortic aneurysm, high risk kidney disease (eGFR < 45) and high risk hypertension in this category *(Strong Recommendation, Moderate-Quality Evidence).*

2. Treatment target for LDL-C ≤ 2.0 mmol/L or ≥ 50% reduction for optimal risk reduction. Apo B (≤ 0.80 g/L) or non-HDL-C (≤ 2.6 mmol/L) be considered as alternative *(Strong Recommendation, Moderate-Quality Evidence).*
High risk: values and preferences

• Our decision to add chronic kidney disease (eGFR < 45) to the high risk category was based on significant emerging epidemiology data and the recently published Study of Heart and Renal Protection (SHARP).

• The treatment of dyslipidemia in subjects on hemodialysis remains controversial and individual judgment is required.
Levels of risk

Practical tips:

• LDL-C remains the primary target in the guidelines. Clinicians would be encouraged to be familiar with the use of LDL-C and one of the two alternate targets.

• We do not advocate using all 3 indices regularly or testing for LDL-C, non-HDL-C and apo B concurrently in subjects.

• For those who have apo B available and are comfortable with using it, there are advantages that were previously addressed.
2012 CCS Dyslipidemia Guidelines Update

Stratify by Risk Features

Low Risk
- No high risk features
- FRS < 10%
- LDL < 5 mmol/L
  - FRS < 5%
  - Health behaviour modification
  - No
- FRS 5%-9%

 Intermediate Risk
- No high risk features
- FRS 10%-19%
- LDL ≥ 5 mmol/L
  - Optional secondary testing
  - Indicates higher risk
  - Yes

 High Risk
- FRS ≥ 20%
- Clinical vascular disease
- Abdominal Aortic Aneurysm
- Diabetes and age ≥ 40 yrs or ≥ 15 yrs duration and age ≥ 30 yrs or microvascular disease *
- Chronic kidney disease
- High risk hypertension
- LDL ≥ 5 mmol/L
- Statin therapy

Health behaviour modification
No statin therapy
Intermediate Risk
- No high risk features
- FRS 10-19%

LDL ≥ 3.5 mmol/L
- Health behaviour modification
- Statin therapy

LDL < 3.5 mmol/L
- Alternate targets
  - Apo B ≥ 1.2 g/L
  - Non-HDL-C ≥ 4.3 mmol/L

If yes to either
Optional secondary testing
  Indicates higher risk
  Yes
  No

If no
Health behaviour modification
No statin therapy

05/08/2013
## Summary of treatment target guidelines

<table>
<thead>
<tr>
<th>Risk Level</th>
<th>Initiate therapy if</th>
<th>Primary Target LDL-C</th>
<th>Alternate Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>Consider treatment in all</td>
<td>≤ 2 mmol/L or 50% decrease in LDL-C</td>
<td>Apo B ≤ 0.8 g/L</td>
</tr>
<tr>
<td></td>
<td>(Strong, High)</td>
<td>(Strong, High)</td>
<td>Non HDL-C ≤ 2.6 mmol/L</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(Strong, Moderate)</td>
</tr>
<tr>
<td>Intermediate</td>
<td>LDL-C ≥ 3.5 mmol/L (Strong, Moderate)</td>
<td>≤ 2 mmol/L or 50% decrease in LDL-C</td>
<td>Apo B ≤ 0.8 mg/L</td>
</tr>
<tr>
<td></td>
<td>Consider if</td>
<td></td>
<td>Non-HDL-C ≤ 2.6 mmol/L</td>
</tr>
<tr>
<td></td>
<td>Apo B ≥ 1.2 g/L or</td>
<td></td>
<td>(Conditional, Moderate)</td>
</tr>
<tr>
<td></td>
<td>Non-HDL-C ≥ 4.3 mmol/L</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(Conditional, Moderate)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low *</td>
<td>LDL-C ≥ 5.0 mmol/L (Strong, Moderate)</td>
<td>50% reduction in LDL-C</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Familial hypercholesterolemia</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(Strong, Moderate)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* for those in the 5 - 9% group, consider yearly calculation of FRS and discussion about risk-benefit ratio of pharmacotherapy at lower levels of LDL-C.
## Statins and low risk individuals

<table>
<thead>
<tr>
<th>5-year MVE risk at baseline</th>
<th>Events (% per annum)</th>
<th>RR/mM (CI)</th>
<th>Trend test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Statin/more</td>
<td>Control/less</td>
<td></td>
</tr>
<tr>
<td>Major coronary event</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;5%</td>
<td>50 (0.11)</td>
<td>88 (0.19)</td>
<td>0.57 (0.36–0.89)</td>
</tr>
<tr>
<td>≥5% to &lt;10%</td>
<td>276 (0.50)</td>
<td>435 (0.79)</td>
<td>0.61 (0.50–0.74)</td>
</tr>
<tr>
<td>≥10% to &lt;20%</td>
<td>1644 (1.29)</td>
<td>1973 (1.57)</td>
<td>0.77 (0.69–0.85)</td>
</tr>
<tr>
<td>≥20% to &lt;30%</td>
<td>1789 (1.93)</td>
<td>2282 (2.49)</td>
<td>0.77 (0.71–0.83)</td>
</tr>
<tr>
<td>≥30%</td>
<td>1471 (3.73)</td>
<td>1887 (4.86)</td>
<td>0.78 (0.72–0.84)</td>
</tr>
<tr>
<td>Overall</td>
<td>5230 (1.45)</td>
<td>6665 (1.87)</td>
<td>0.76 (0.73–0.79)</td>
</tr>
<tr>
<td>Major vascular event</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;5%</td>
<td>167 (0.38)</td>
<td>254 (0.56)</td>
<td>0.62 (0.47–0.81)</td>
</tr>
<tr>
<td>≥5% to &lt;10%</td>
<td>604 (1.10)</td>
<td>847 (1.57)</td>
<td>0.69 (0.60–0.79)</td>
</tr>
<tr>
<td>≥10% to &lt;20%</td>
<td>3614 (2.96)</td>
<td>4195 (3.50)</td>
<td>0.79 (0.74–0.85)</td>
</tr>
<tr>
<td>≥20% to &lt;30%</td>
<td>4108 (4.74)</td>
<td>4919 (5.80)</td>
<td>0.81 (0.77–0.86)</td>
</tr>
<tr>
<td>≥30%</td>
<td>2787 (7.64)</td>
<td>3458 (9.82)</td>
<td>0.79 (0.74–0.84)</td>
</tr>
<tr>
<td>Overall</td>
<td>11280 (3.27)</td>
<td>13673 (4.04)</td>
<td>0.79 (0.77–0.81)</td>
</tr>
</tbody>
</table>
Secondary Testing

1. We recommend secondary testing for further risk assessment in “intermediate risk” (10-19% FRS after adjustment for family history) subjects who are not candidates for lipid treatment based on conventional risk factors or for whom treatment decisions are uncertain. 

*(Strong/moderate evidence)*

2. We suggest that secondary testing may be considered for a selected subset of “low to intermediate risk” (5-9% FRS after adjustment for family history) subjects for whom further risk assessment is indicated, e.g. strong family history of premature CAD, abdominal obesity, South Asian ancestry or impaired glucose tolerance.

*(Weak/low evidence)*
## Optional Biomarkers for Further Risk Assessment

<table>
<thead>
<tr>
<th>Biomarker</th>
<th>Indications for testing</th>
<th>Frequency of testing</th>
<th>Normal Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lp(a)</td>
<td>• Further risk assessment particularly in individuals with a family history of premature CVD</td>
<td>• Genetically determined risk factor</td>
<td>&lt; 30 mg/dl (&lt; 300 mg/L)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Repeat testing not required</td>
<td></td>
</tr>
<tr>
<td>hsCRP</td>
<td>• Men &gt; 50y and women &gt; 60y who are not candidates for statin Rx based on conventional risk factors</td>
<td>• q 3 y from age 50 y (M) 60 y (F)</td>
<td>1.0 lowest risk to 3.0 high risk</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• If &gt; 2.0 mg/L, repeat in 2-4 wk, use lower value for risk assessment</td>
<td></td>
</tr>
<tr>
<td>A1C</td>
<td>• Further risk assessment in selected subjects with FPG &gt;5.6 mmol/L</td>
<td>• q 1 - 5 y</td>
<td>&lt; 5.5% low risk to &gt; 6.5 % diabetes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• more frequently if weight gain or incr FBG</td>
<td></td>
</tr>
<tr>
<td>Urinary Alb/Cr</td>
<td>• T2DM</td>
<td>• q 1 y for patients with T2DM or poorly controlled HTN</td>
<td>&lt; 3 mg/mmol</td>
</tr>
<tr>
<td></td>
<td>• poorly controlled HTN</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Selected patients who are not candidates for statin Rx based on conventional risk factors</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Optional Noninvasive Tests for Further Risk Assessment

<table>
<thead>
<tr>
<th>Noninvasive test</th>
<th>Indications for testing</th>
<th>Normal Range</th>
<th>Frequency of testing</th>
</tr>
</thead>
</table>
| Graded exercise stress test       | • Selected asymptomatic adults with CVD risk factors especially those who are embarking on a vigorous exercise program  
• Selected adults in the intermediate risk category                                                                                                       | Duke Score<sup>a</sup>  
Low risk: ≥ +5  
Moderate risk: -10 to +4  
High risk: ≤ -11                                                               | q 3-10 y or if symptoms develop                                                                                                |
| Carotid imaging                   | Selected asymptomatic adults in not candidates for statin Rx based on conventional risk factors. Only in centres with expertise                                                                                             | CIMT <1.0 mm  
No visible plaque<sup>b</sup>                                                                 | q 5-10 y as indicated for reassessment of risk                                                                                  |
| ABI                               | Selected asymptomatic adults, not candidates for statin Rx based on conventional risk factors (particularly smokers, diabetes)                                                                                                     | ABI 1.0-1.3<sup>c</sup>                                                                                                        | q 5-10 y as indicated for reassessment of risk or if symptoms develop                                    |
| CAC                               | Selected asymptomatic adults who are not candidates for statin Rx based on conventional risk factors                                                                                                                      | CAC  
Low risk: 0  
Increased risk: 0 – 100  
High risk: 100-300<sup>d</sup>  
Very high risk: > 300<sup>e</sup>                                                                 | CAC = 0  q 10y where clinically indicated  
CAC = 0 – 100  q 3-5y if Rx is deferred                                                                 |
Choice & Interpretation of Noninvasive Tests

GXT: May be indicated for sedentary patient wishing to start exercise program; note that CAD risk is also increased in subjects with low exercise capacity (< 6 METS)

ABI: Consider for patient with suspected PAD. ABI < 0.90 is an indication for intensive statin therapy

Carotid IMT: Each 0.1 mm increase in CIMT is associated with a 10% increased risk for MI and a 13% increased risk for stroke. Visible arterial wall plaques defined as a CIMT > 1.5 mm or CIMT values > 75% for age and sex are considered as evidence of subclinical atherosclerosis and an indication for statin therapy

Coronary artery calcium: Highest incremental value but radiation exposure and not yet generally available. CAC > 100 is generally an indication for statin Rx. CAC > 300 places patient in very high risk category (10 y risk of MI/CV death = 28%)
Lifestyle Section

• Health behaviour interventions are the cornerstone of cardiovascular disease management and prevention
  – Diets
  – Exercise
  – Alcohol intake
  – Cigarette smoking
  – Stress and mental health issues
Lifestyle Section

“I want you to keep eating pizza and cheeseburgers. At this point, a salad might shock your system and kill you.”
Recommendations

We suggest that all individuals be encouraged to adopt healthy eating habits to lower their cardiovascular (CVD) risk:

1. Moderate energy (caloric) intake to achieve and maintain a healthy body weight
2. Emphasize a diet rich in vegetables, fruit, whole-grain cereals, and polyunsaturated and monounsaturated oils, including omega-3 fatty acids particularly from fish
3. Avoid trans fats, limit saturated and total fats to < 7% and < 30% of daily total energy (caloric) intake, respectively
4. Increase daily fibre intake to > 30 g
5. Limit cholesterol intake to 200 mg daily for individuals with dyslipidemia or at increased CVD risk

*(Conditional Recommendation, Moderate-Quality Evidence)*
Recommendations

We recommend the Mediterranean, Portfolio or DASH diets to improve lipid profiles or decrease CVD risk

(Strong Recommendation, High-quality Evidence)

and for cholesterol lowering consider increasing phytosterols, soluble fibre, soy and nut intake

(see Table 7)
Mediterranean Diet

7447 high risk Prim prevention

Med diet with olive oil
Med diet with nuts
Fat reduced diet

MI, death or CVA
N=288 events

Estruch et al. NEJM 2013; ahead of press
Lifestyle Section

"What fits your busy schedule better, exercising one hour a day or being dead 24 hours a day?"
Recommendations

• We recommend that adults should accumulate at least 150 min. of moderate-to-vigorous-intensity aerobic physical activity per week, in bouts of 10 min or more to reduce cardiovascular disease risk. *(Strong Recommendation, High-Quality Evidence)*

• We recommend smoking cessation *(Strong Recommendation, Moderate-Quality Evidence)*

• and limiting alcohol intake to 30 g or less per day (1-2 drinks) *(Conditional Recommendation, Moderate-Quality Evidence)*
Statin Intolerance

• Since overall risk/benefit favours therapy in patients meeting criteria for lipid lowering therapy and CV risk reduction, we recommend:
  a) statins not be withheld on the basis of a potential, small risk of new-onset diabetes mellitus emerging during long-term therapy
     *(Strong recommendation; Very Low-Quality Evidence)*
Treatment

• Statins remain the first line treatment of dyslipidemia in patients at high risk for cardiovascular disease
  a) If treatment targets are not reached with appropriately dosed statins OR if patient is intolerant of the dose of statin which could achieve target – the addition of a bile acid sequestrant or ezetimibe should be considered
Statin Intolerance

b) despite concerns about a variety of other possible adverse effects, all purported statin-associated symptoms should be evaluated systematically, incorporating observation during cessation, re-initiation (same or different statin, same or lower potency, same or decreased frequency of dosing) to identify a tolerated, statin-based therapy for chronic use.  
(Strong Recommendation, Very Low-Quality Evidence)
Statin Intolerance

c) We do not recommend vitamins, minerals or supplements for symptoms of myalgia perceived to be statin-associated.

*(Strong Recommendation, Very Low-Quality Evidence)*
Figure 5. Management approach for muscle symptoms or hyperCKemia. CK, creatine kinase; ULN, upper limit of normal.

Summary

• Important to assess risk in a systematic fashion
• Choose a target that you are comfortable with
• Recognize that the trend is towards earlier treatment based on CTT meta-analysis
• Only use secondary testing if it will change Rx approach for the patient
• Non-pharmacological Rx is the backbone of therapy and should be strongly advocated
• Statins remain cornerstone of drug therapy