Hyperlipidemia in an Otherwise Healthy 80 Year-Old Patient

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Professor of Medicine
Hyperlipidemia in an Otherwise Healthy 80-Year-Old Patient

- Primary Prevention Issues in the Elderly:
  - Coronary artery disease
  - Stroke
  - Cancer
  - Dementia
  - Osteoporosis
Death rates from coronary heart disease (CHD) in men and women with increasing age. The mortality rate rises dramatically in the elderly.

Changes in plasma LDL- and HDL-cholesterol concentrations with age in men and women. LDL-cholesterol levels rise with age; this effect is initially more prominent in men but, by age 70, LDL-cholesterol levels are higher in women. Data from Heiss, G, Tamir, I, Davis, CE, et al, Circulation, 1980; 61:302.
Hyperlipidemia in an Otherwise Healthy 80 Year-Old Patient

- Leading causes of death at age 80 (men)
  - Heart disease – 28.2%
  - Cancer – 26.4%
  - COPD – 7.1%
  - Stroke – 5.6%
  - Diabetes – 3.1%
  - Alzheimer’s Disease – 2.5%

CDC 2006 data
Hyperlipidemia in an Otherwise Healthy 80 Year-Old Patient

- Framingham Risk Calculator

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Risk Assessment Tool for Estimating 10-year Risk of Developing Hard CHD (Myocardial Infarction and Coronary Death)

The risk assessment tool below uses recent data from the Framingham Heart Study to estimate 10-year risk for "hard" coronary heart disease outcomes (myocardial infarction and coronary death). This tool is designed to estimate risk in adults aged 20 and older who do not have heart disease or diabetes. Use the calculator below to estimate 10-year risk.

Age: 65 years
Gender: Male
Total Cholesterol: 230 mg/dL
HDL Cholesterol: 35 mg/dL
Smoker: Yes
Systolic Blood Pressure: 140 mm/Hg
Currently on any medication to treat high blood pressure: Yes

[Calculate 10-Year Risk]
Hyperlipidemia in an Otherwise Healthy 80 Year-Old Patient

- Framingham Risk Calculator

<table>
<thead>
<tr>
<th>Risk score results:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Age:</td>
<td>65</td>
</tr>
<tr>
<td>Gender:</td>
<td>male</td>
</tr>
<tr>
<td>Total Cholesterol:</td>
<td>230 mg/dL</td>
</tr>
<tr>
<td>HDL Cholesterol:</td>
<td>35 mg/dL</td>
</tr>
<tr>
<td>Smoker:</td>
<td>No</td>
</tr>
<tr>
<td>Systolic Blood Pressure:</td>
<td>140 mm/Hg</td>
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<tr>
<td>On medication for HBP:</td>
<td>No</td>
</tr>
<tr>
<td><strong>Risk Score</strong></td>
<td>19%</td>
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</tbody>
</table>

*The risk score shown was derived on the basis of an equation. Other NCEP materials, such as ATP III print products, use a point-based system to calculate a risk score that approximates the equation-based one.

To interpret the risk score and for specific information about CHD risk assessment as part of detection, evaluation, and treatment of high blood cholesterol, see ATP III Executive Summary and ATP III At-a-Glance.
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- Framingham Risk Calculator


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- **Age:** 80 years
- **Gender:** Male
- **Total Cholesterol:** 230 mg/dL
- **HDL Cholesterol:** 35 mg/dL
- **Smoker:** No
- **Systolic Blood Pressure:** 140 mm/Hg
- **Currently on any medication to treat high blood pressure:** No

[Calculate 10-Year Risk]
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- Framingham Risk Calculator

<table>
<thead>
<tr>
<th>Risk score results:</th>
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<tbody>
<tr>
<td>Age:</td>
<td>80</td>
</tr>
<tr>
<td>Gender:</td>
<td>Male</td>
</tr>
<tr>
<td>Total Cholesterol:</td>
<td>230 mg/dL</td>
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<tr>
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<td>No</td>
</tr>
<tr>
<td>Systolic Blood Pressure:</td>
<td>140 mm/Hg</td>
</tr>
<tr>
<td>On medication for HBP:</td>
<td>No</td>
</tr>
<tr>
<td>Risk Score*</td>
<td>26%</td>
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</tbody>
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Age: 80 years
Gender: Male
Total Cholesterol: 230 mg/dL
HDL Cholesterol: 25 mg/dL
Smoker: No
Systolic Blood Pressure: 140 mm/Hg
Currently on any medication to treat high blood pressure: No

[Calculate 10-Year Risk]
Hyperlipidemia in an Otherwise Healthy 80 Year-Old Patient

- Framingham Risk Calculator

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**Risk score results:**

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Value</th>
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<tbody>
<tr>
<td>Age</td>
<td>80</td>
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</tr>
<tr>
<td>On medication for HBP</td>
<td>No</td>
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<td>Risk Score*</td>
<td>Greater than 30%</td>
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- Pleiotropic effects of statins:
  - Anti-inflammatory effects (reduced hs-CRP)
  - Anti-oxidant properties
  - Immunomodulatory effects
  - Anti-thrombotic properties
  - Enhanced vascular reactivity

Hyperlipidemia in an Otherwise Healthy 80 Year-Old Patient

- Alleged Benefits of Statins:
  - Reduced cardiac events
  - Reduced risk of stroke
  - Reduced progression of rheumatic aortic stenosis
  - Reduced risk of dementia
  - Reduced risk of osteoporosis
  - Reduced risk of cancer
  - Reduced mortality from sepsis
Hyperlipidemia in an Otherwise Healthy 80 Year-Old Patient

- Statin Primary Prevention Trials

Figure 5: Relation of Major Cardiovascular Event Rate to LDL-C at 1 Year in Primary Prevention Trials

Jupiter Trial JACC 2011;57:1666
Hyperlipidemia in an Otherwise Healthy 80 Year-Old Patient

- Lipid Therapy and Stroke: Meta-Analysis (JACC 2010;56:198)
Hyperlipidemia in an Otherwise Healthy 80 Year-Old Patient

- Progression of Rheumatic Aortic Stenosis:
  - 164 patients with aortic peak flow > 1.5 m/sec (mean 2.3 ± 0.07 m/sec in all patients)
  - Patients had a history of rheumatic fever or classic rheumatic mitral valve disease
  - 30 treated with statins; 134 not treated
  - Mean follow-up of 8.5 ± 4.2 years
  - Annual increase in peak velocity 0.05 ± 0.07 m/sec in the statin-treated group; 0.12 ± 0.11 m/sec in the no-statin group

- Progression of Calcific Aortic Stenosis: no benefit*

JACC 2009;53:1874
NEJM 2005;352:2389*
Hyperlipidemia in an Otherwise Healthy 80 Year-Old Patient

- Alleged Benefits of Statins:
  - Reduced risk of dementia
  - Reduced intracellular and extracellular amyloid burden in brain tissue (animal models)*
  - Indirect effect via decreasing risk of stroke
  - Rotterdam Study+
    - 6992 patients enrolled 1990-93 & followed to 2005
    - Review of pharmacy records
    - Reduced incidence of Alzheimer’s Disease (HR 0.57)
    - No benefit from non-statin cholesterol-lowering drugs

*Proc Natl Acad Sci USA 2001;98:5856
+J Neurol Neurosurg Psychiatry 2009;80:13
Hyperlipidemia in an Otherwise Healthy 80 Year-Old Patient

- Alleged Benefits of Statins:
  - Reduced risk of osteoporosis
    - 5 observational studies suggesting reduced fracture risk for patients on statins
    - 2 observational studies showing no benefit
    - 1 randomized, placebo-controlled trial of 86 post-menopausal women showed no benefit

J Bone Miner Res. 2004;19(5):737
Hyperlipidemia in an Otherwise Healthy 80 Year-Old Patient

- Alleged Benefits of Statins:
  - Reduced risk of cancer
    - 3 observational studies suggested decreased risk of cancer associated with statin use
    - 5 observational studies showed no benefit
    - Retrospective, propensity-matched analysis of 45,857 patients (GE Centricity database) showed no increased or decreased risk of cancer from statin use*

*JACC 2011;58:530
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- Alleged Benefits of Statins:
  - Reduced mortality from sepsis
    - Canadian population-based study showed decreased incidence of sepsis, severe sepsis and fatal sepsis in statin-treated patients (Lancet 2006)
    - Retrospective review of 1041 dialysis pts showed reduced incidence of sepsis in statin-treated pts (JAMA 2007)
    - Meta-analysis of 16 cohort studies showed decreased risk of serious infections in statin-treated pts (Arch Int Med 2009)
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  - Reduced progression of rheumatic aortic stenosis
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  - Reduced risk of osteoporosis
  - Reduced risk of cancer
  - Reduced mortality from sepsis
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- Primary Prevention of CAD in the Elderly:
  - \( \text{LDLc} \ 130-159 \): Life-habit changes
  - \( \text{LDLc} \ 160-189 \): Drug Rx for \( \geq 2 \) risk factors
  - \( \text{LDLc} \ > \ 190 \): Drug Rx