American Diabetes Association Clinical 2009 Practice Recommendations
Dyslipidemia/Lipid Management

Thomas Dayspring, MD, FACP
Clinical Assistant Professor of Medicine
University of Medicine and Dentistry of New Jersey,
New Jersey Medical School

Diplomate of the American Board of Clinical Lipidology
Certified Menopause Practitioner: North American Menopause Society

North Jersey Institute of Menopausal Lipidology
Wayne, New Jersey

St. Joseph’s Regional Medical Center Paterson, NJ
American Diabetes Association
Dyslipidemia/Lipid Management 2009

- Measure fasting lipid profile annually
- In adults with low risk lipid values
  - LDL-C < 100 mg/dL, HDL-C > 50 mg/dL and TG < 150 mg/dL, lipid assessments may be repeated every two years

Diabetes Care 2009;32(suppl 1):S29-31
Lifestyle modification focusing on reduction of saturated fat, trans fat and cholesterol intake
- Weight loss (if indicated)
- Increased physical activity
Statin Therapy should be added to lifestyle regardless of baseline lipid levels for diabetics:
- With overt CVD
- Without overt CVD who are over the age of 40 and have one or more CVD risk factors
- For lower risk patients (without over CVD < age 40), statins should be considered if LDL-C is > 100 mg/dL or in those with multiple CVD risk factors
## American Diabetes Association Dyslipidemia/Lipid Management 2009

<table>
<thead>
<tr>
<th>Study</th>
<th>CVD prevention</th>
<th>Statin Dose &amp; Comparator</th>
<th>RRR</th>
<th>ARR</th>
<th>LDL-C Reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>4s-DM</td>
<td>2˚</td>
<td>Simva 20-40 vs Plbo</td>
<td>50</td>
<td>42.5</td>
<td>36% 186 to 118</td>
</tr>
<tr>
<td>ASPEN 2˚</td>
<td>2˚</td>
<td>Atorva 10 vs Plbo</td>
<td>34</td>
<td>12.7</td>
<td>29% 112-79</td>
</tr>
<tr>
<td>HPS-DM</td>
<td>2˚</td>
<td>Simva 40 vs Plbo</td>
<td>17</td>
<td>7.5</td>
<td>31% 123–84</td>
</tr>
<tr>
<td>CARE-DM</td>
<td>2˚</td>
<td>Prava 40 vs Plbo</td>
<td>13</td>
<td>5.4</td>
<td>27% 136-99</td>
</tr>
<tr>
<td>TNT-DM</td>
<td>2˚</td>
<td>Atorva 80 vs Atorva 10</td>
<td>18</td>
<td>4.7</td>
<td>22% 99-77</td>
</tr>
<tr>
<td>HPS-DM</td>
<td>1˚</td>
<td>Simva 40 vs Plbo</td>
<td>34</td>
<td>6.0</td>
<td>31% 124-86</td>
</tr>
<tr>
<td>CARDs</td>
<td>1˚</td>
<td>Atorva 10 vs Plbo</td>
<td>35</td>
<td>4</td>
<td>40% 118-71</td>
</tr>
<tr>
<td>ASPEN</td>
<td>1˚</td>
<td>Atorva 10 vs Plbo</td>
<td>19</td>
<td>1.9</td>
<td>30% 114-80</td>
</tr>
<tr>
<td>ASCOT-DM</td>
<td>1˚</td>
<td>Atorva 10 vs Plbo</td>
<td>8</td>
<td>0.9</td>
<td>34% 125-82</td>
</tr>
</tbody>
</table>

Diabetes Care 2009;32(suppl 1):S29-31
In individuals with overt CVD, a lower LDL-C goal of < 70 mg/dL using a high dose of statin is an option.

If drug-treated patients do not reach goal on maximally tolerated statin a reduction of ~30-40% from baseline is an alternative goal.

TG levels < 150 mg/dL and HDL-C > 40 mg/dL in men and 50 mg/dL in women are desirable.

However LDL-C targeted statin therapy remains the preferred strategy.
American Diabetes Association
Dyslipidemia/Lipid Management 2009

Treatment Recommendations

- If targets are not reached on maximally tolerated doses of statins, combination therapy using statins and other lipid-lowering agents may be considered to achieve lipid targets.
- These have not been evaluated in clinical outcome studies for CVD outcomes or safety.
- Statin therapy is contraindicated in pregnancy.

Diabetes Care 2009;32(suppl 1):S29-31
<table>
<thead>
<tr>
<th>Summary of Glycemic, BP and Lipid Control</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A1C</strong></td>
</tr>
<tr>
<td><strong>Blood Pressure</strong></td>
</tr>
<tr>
<td><strong>Lipids</strong></td>
</tr>
<tr>
<td>LDL-C</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

American Diabetes Association
Dyslipidemia/Lipid Management 2009

Diabetes Care 2009;32(suppl 1):S29-31
Low levels of HDL-C, often associated with high TG levels are the most prevalent pattern of dyslipidemia in T2DM.

The evidence base for drugs that target these lipid fractions is significantly less robust than that for statin therapy.

Nicotinic acid has been shown to reduce outcomes although the study was done in nondiabetics.

Gemfibrozil has been shown to reduce events in subjects without diabetes and in the diabetic subgroup in one of the larger trials.

In a large trial specific to diabetics, fenofibrate failed to reduce overall CVD events.

Diabetes Care 2009;32(suppl 1):S29-31
Very little clinical trial evidence exists for T2DM under the age of 40 or for T1DM patients of any age.

In the Heart Protection trial, the subgroup of 600 patients with T1DM (lower age limit 40) had a proportionately similar risk reduction in risk as those with T2DM.

Although the data are not definitive, consideration should be given to similar lipid-lowering goals in T1DM as those in T2DM, particularly if they have other CVD risk factors.

Diabetes Care 2009;32(suppl 1):S29-31
In individual patients, LDL-C lowering with statins is highly variable.

Reduction of CVD events with statins correlates very closely with LDL-C lowering.

When maximally tolerated doses of statins fail to significantly lower LDL-C (<30% from baseline) the primary aim of combination therapy should be to achieve additional LDL-C lowering.

- Niacin, fenofibrate, ezetimibe and bile acid sequestrants all offer additional LDL-C lowering.

The evidence that combination therapy provides a significant increment in CVD risk reduction remains elusive.
Severe hypertriglyceridemia may warrant immediate therapy with lifestyle and pharmacologic therapy (fibric acid or niacin) to reduce the risk of pancreatitis.

In the absence of severe hypertriglyceridemia, targeting HDL-C or TG has intuitive appeal but lacks the evidence of statin therapy.

If the HDL-C is < 40 mg/dL and the LD-C is between 100 -129 mg/dL, gemfibrozil or niacin might be used.
Niacin is the most effective drug for raising HDL-C. It can significantly increase glucose at high doses but recent studies demonstrate that at modest doses (750-2000 mg/day) significant improvements in LDL-C, HDL-C and TG are accompanied by only modest changes in glucose that are generally amenable to adjustment of diabetes therapy.
Combination therapy with a statin/fibrate or statin/niacin may be efficacious for treatment of all three lipid fractions, but this combination is associated with an increase risk for abnormal aminase levels, myositis or rhabdomyolysis.

Rhabdomyolysis risk is higher with the higher doses of statins and with renal insufficiency and seems to be lower when statins are combined with fenofibrate than gemfibrozil.
In 2008 a consensus panel of ADA/ACC recommended a greater focus on non-HDL-C and apolipoprotein B in patients who are likely to have small particles such as diabetes.

The panel suggested in statin treated patients in whom the LDL-C goal is < 70 mg/dL (non-HDL-C < 100 mg/dL) the apoB be treated to < 80 mg/dL.

For statin treated patients with an LDL-C goal of < 100 mg/dL (non-HDL-C < 130 mg/dL) apo B should be treated to < 90 mg/dL.

Diabetes Care 2009;32(suppl 1):S29-31