American Diabetes Association Clinical 2009 Practice Recommendations Dyslipidemia/Lipid Management

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- 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

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American Diabetes Association Dyslipidemia/Lipid Management 2009

Treatment Recommendations

- Lifestyle modification focusing on reduction of saturated fat, trans fat and cholesterol intake
- Weight loss (if indicated)
- Increased physical activity

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Treatment Recommendations

- 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

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

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Treatment Recommendations

- 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

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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

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Summary of Glycemic, BP and Lipid Control

A1C	< 7.0%
Blood Pressure	< 130/80
Lipids	
LDL-C	< 100 mg/dL
	< 70 in those with overt CHD

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- 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

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- 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

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- 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

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- 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

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- 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

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- 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

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- 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

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