

Preventing & Treating Cardiovascular Events in Patients with Atherosclerotic Disease or Diabetes

- Counsel all patients on lifestyle modification, the cornerstone of cardiovascular disease prevention.
- Treat all patients with coronary or other atherosclerotic disease or diabetes to reach an LDL goal of <100 mg/dL; consider an LDL goal of <70 mg/dL for very high-risk patients.
- Prescribe statins to lower LDL and reduce cardiovascular events and mortality by at least 30%.

Lipid Goals in Patients With Atherosclerotic Disease or Diabetes

LDL*	<100 mg/dL
	<70 mg/dL (option in very high-risk patients)
Total Cholesterol	<200 mg/dL
HDL	>40 mg/dL (men)
	>50 mg/dL (women)
Triglycerides	<150 mg/dL

* Lipid panels use calculated LDL: $LDL = Total\ cholesterol - (triglycerides/5) - HDL$.
This formula is applicable only when triglycerides are <400 mg/dL.

Very High-Risk patients include those with cardiovascular disease plus any of the following:

- Recent acute coronary syndrome
- Multiple major CVD risk factors (especially diabetes)
- Severe and poorly controlled risk factors (especially cigarette smoking)
- Multiple risk factors of the metabolic syndrome (a condition associated with increased risk of CVD and diabetes), especially with high triglycerides (≥ 200 mg/dL) and low high-density lipoprotein (HDL) cholesterol (<40 mg/dL)

LDL Management in Patients With Atherosclerotic Disease or Diabetes

Initial LDL Level	Lifestyle Modification	Initiation of Drug Therapy
≥ 130 mg/dL	Yes	Start statin therapy simultaneously with lifestyle modification.
100-129 mg/dL	Yes	Consider starting statin therapy simultaneously with lifestyle modification. Definitely start statin therapy if still >100 mg/dL after 3 months of lifestyle modification.** In patients hospitalized with an acute cardiovascular or coronary event, initiate statin therapy prior to discharge.
<100 mg/dL	Yes	Statin therapy is not required, but may further lower risk in some patients. Lowering to <70 mg/dL in very high-risk patients is an option.

** In people younger than 40 years with diabetes but without CVD, lifestyle modification alone may be sufficient; however, data for this subpopulation are limited. Use clinical judgment based on other cardiovascular risk factors to guide whether or when to start drug therapy if the LDL goal of <100 mg/dL is not met by lifestyle modification alone.

Lifestyle Modification to Manage Cholesterol

Healthy Diet	Limit saturated fat and cholesterol intake, increase fiber. Avoid all trans fat.
Weight Management	Even modest weight loss is beneficial. Lose weight gradually, aiming for 1 to 2 lbs/week.
Physical Activity	Get at least 30 minutes of moderate physical activity (such as a brisk walk) at least 5 times/week.
Smoking Cessation	Set a quit date and make a plan to quit.

Adapted from: Berger DK, Silver L, Bassett MT. Lipid Control: Preventing Cardiovascular Events in Patients With Atherosclerotic Disease or Diabetes. *City Health Information*. 2006;25(5):33-40.

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Treating to Target LDL in Patients with Atherosclerotic Disease or Diabetes

Drug Class	Agents and Daily Doses	Lipid Effects	Adverse Effects	Contraindications
Statins	Atorvastatin (10-80 mg) Fluvastatin (20-80 mg) Lovastatin (10-80 mg) Pravastatin (10-80 mg) Rosuvastatin (5-80 mg)* Simvastatin (10-80 mg)	LDL-C ↓ 17-62% HDL-C ↑ 5-15% TG ↓ 7-30%	<ul style="list-style-type: none"> • Myopathy • Increased liver enzymes 	<p>Absolute:</p> <ul style="list-style-type: none"> • Active or chronic liver disease • Pregnancy • Lactation <p>Relative:</p> <ul style="list-style-type: none"> • Concomitant use of certain drugs**
Bile Acid Sequestrants	Cholestyramine (4-16 g BID) Colesevelam (3.75 g QD) Colestipol (5-20 g TID)	LDL-C ↓ 15-30% HDL-C ↑ 3-5% TG No change or increase	<ul style="list-style-type: none"> • GI Distress • Constipation • Decreased absorption of other drugs 	<p>Absolute:</p> <ul style="list-style-type: none"> • Dysbetalipoproteinemia • TG >400 mg/dL <p>Relative:</p> <ul style="list-style-type: none"> • TG >200 mg/dL
Niacin	Niacin Immediate release (1.5-3 g TID) Niaspan® Extended release (1-2 g HS)	LDL-C ↓ 5-25% HDL-C ↑ 15-35% TG ↓ 20-50%	<ul style="list-style-type: none"> • Flushing • Hyperglycemia • Hyperuricemia (or gout) • Upper GI distress • Hepatotoxicity 	<p>Absolute:</p> <ul style="list-style-type: none"> • Chronic liver disease • Severe gout <p>Relative:</p> <ul style="list-style-type: none"> • Diabetes • Hyperuricemia • Peptic ulcer disease
Fibrates	Gemfibrozil (600 mg BID) Fenofibrate (200 mg BID)	LDL-C ↓ 5-20% HDL-C ↑ 10-20% TG ↓ 20-50%	<ul style="list-style-type: none"> • Dyspepsia • Gallstones • Myopathy 	<p>Absolute:</p> <ul style="list-style-type: none"> • Severe renal disease • Severe hepatic disease
Cholesterol Absorption Inhibitor	Ezetimibe (10 mg QD)	LDL-C ↓ 18% HDL-C ↑ 1% TG ↓ 8%	<ul style="list-style-type: none"> • GI Distress 	<ul style="list-style-type: none"> • Active liver disease or elevated LFTs especially if with statin • Lactation

***Rosuvastatin**, while very effective in lowering LDL, has been associated with higher rates of renal insufficiency and acute renal failure.

****Relative** - concomitant use of cyclosporine, macrolide antibiotics, various antifungal agents, and other CYP3A4 inhibitors; pravastatin, fluvastatin, and rosuvastatin are not metabolized by CYP3A4.

Fifty percent of patients discontinue statins within the first year of use. To increase medication adherence, make sure your patients know:

- Medication should be taken EVERY DAY – even when feeling good.
- Adverse effects such as muscle soreness, tenderness or pain, headache or dyspepsia in the case of statins, can occur and should immediately be reported to the health care provider.
- Cholesterol-lowering medication is for a chronic condition and treatment is for an indeterminate length of time.
- Treatment for high cholesterol is for life. It can include:
 - Diet
 - Lifestyle modification
 - Medication