

The UCLA Comprehensive Atherosclerosis Treatment Program Clinical Practice Guideline

Definitive Therapy for Patients with Coronary and Other Vascular Disease

Atherosclerosis is a progressive disease. While the short-term prognosis may be improved with medical management and revascularization strategies, the underlying atherosclerotic disease process must be addressed in order to improve long-term patient outcome. Overwhelming scientific evidence demonstrates that treatment alters the natural history of this disease, improves clinical outcomes, and prolongs survival. The goal, whether it be during hospitalization or an outpatient visit for any reason, in a patient with coronary artery disease, cerebral vascular disease, peripheral vascular disease, or similar risk is to ensure the initiation and maintenance of clinical trial evidence-based therapies. Patients with diabetes have similar cardiovascular risk as patients with established atherosclerosis and should also be targeted for treatment, irrespective of symptoms, presence of atherosclerosis, or degree of glycemic control.

Therapies that have definitively been demonstrated to lower the risk of subsequent mortality in patients with atherosclerosis include aspirin, cholesterol lowering medications, angiotensin converting enzyme (ACE) inhibitors, omega-3 fatty acids, exercise, and smoking cessation. Beta blockers lower the risk of myocardial infarction in patients with coronary artery disease, other atherosclerotic vascular disease, or diabetes, as well as prolong survival in patients after acute coronary syndromes (ACS) and those with heart failure. Despite the clinical trial evidence supporting their use, these survival enhancing therapies are underutilized when guided by conventional care. This treatment program guideline aims to optimize the initiation and maintenance of the definitive evidence-based treatments for atherosclerosis.

Atherosclerosis Treatment Program Overview

- ② The diagnostic and therapeutic focus for patients with coronary artery, other vascular disease, and diabetes should shift to address the underlying atherosclerosis disease process.
- ② Patients with coronary artery, other vascular disease, and/or diabetes should be treated with therapies that have been demonstrated in randomized clinical trials to alter the natural history of atherosclerosis, decrease cardiovascular events, and improve survival.
- ② Patients should be treated regardless of whether they have undergone or are undergoing a revascularization procedure and regardless of whether they have symptomatic angina, silent ischemia, or atherosclerosis without ischemia.
- ② Antiplatelet agents, beta blocker, ACE inhibitor, statin, omega-3 fatty acids, diet, and an aerobic exercise program should be considered initial and fundamental therapy for all patients with clinical manifestations of any atherosclerotic vascular disease (coronary artery disease, peripheral vascular disease, and/or carotid artery disease) and/or diabetes, irrespective of presence or absence of known vascular disease.

Patients with documented atherosclerosis or diabetes should not be discharged from the hospital or leave their outpatient encounter without initiation of treatment, unless contraindicated. This consists of:

Aspirin (81-162 mg daily) should be started and continued in all patients, unless contraindicated. Alternately, clopidogrel 75 mg daily should be started in aspirin allergic or intolerant patients. The combination of aspirin + clopidogrel is recommended in ACS, post stent, and other high-risk patients.

Statin therapy should be started in all atherosclerotic vascular disease (AVD) patients and/or patients with diabetes irrespective baseline LDL-cholesterol. Treatment should be started immediately.

Target Lipid Levels in patients with coronary artery, other vascular disease, or diabetes:
 LDL < 70 mg/dL HDL > 40 mg/dL TG < 150 mg/dL

ACE inhibitors should be started in all patients, even if the blood pressure and ejection fraction are normal, irrespective of renal function, unless contraindicated or not tolerated. Angiotensin receptor antagonists should be provided, if ACE inhibitor therapy is not tolerated or has unacceptable side effects.

Beta blockers should be started in all patients, including those with heart failure and diabetes, unless contraindicated or not tolerated.

Omega-3 fatty acids should be started in all patients and all patients should be provided with dietary instructions, including ideal weight (body mass index).

An aerobic exercise program consisting of moderate intensity activity 30-60 minutes a minimum of 5 times a week should be prescribed.

Patients should be strongly encouraged to stop smoking and formal cessation Rx/referral provided.

Ⓣ Therapies such as type I anti-arrhythmic agents that have been shown to potentially increase the risk of an adverse outcome should, in general, be avoided in patients with AVD.

Ⓣ Therapies such as nitrates and calcium channel blockers that provide symptomatic benefit but have not been shown to impact mortality or the incidence of coronary events should, in general, be reserved for patients who remain unacceptably symptomatic despite therapy with ASA, statin, ACE inhibitor, beta blocker, and an exercise program.

Cardiovascular Hospitalization Atherosclerosis Management Program: CHAMP Treatment Algorithm

Patients with established coronary artery, cerebral vascular, and peripheral atherosclerosis are at high risk for vascular events and cardiac death regardless of identifiable risk factors and regardless of whether they have undergone revascularization. Combination cardiovascular protective therapy targeting the underlying atherosclerotic disease process can markedly improve clinical outcome in patients with atherosclerosis, whereas failure to employ these therapies increases patient mortality. Compliance and treatment utilization can be enhanced by employing secondary prevention measures prior to hospital discharge. Patients should not be discharged from the hospital (including chest pain, unstable angina, acute myocardial infarction, cardiac catheterization, angioplasty, coronary bypass, ischemic heart failure hospitalizations, and diabetes hospitalization for any reason) without initiation of definitive atherosclerosis treatment, unless contraindications exist and are documented.

In patients with coronary, cerebral, or peripheral atherosclerosis and/or diabetes:

Prior to hospital discharge	Send admission (nonfasting) cardiovascular lipid panel and baseline LFTs Prescribe antiplatelet Rx, statin, ACEI, beta blocker, exercise, O3FA, and dietary counseling Document smoking status and advice to stop smoking
Six week follow-up visit	Obtain fasting cardiovascular lipid panel and LFTs in 6 weeks Adjust statin dose or add combination therapy to achieve LDL cholesterol < 70 mg/dL Recheck in 6 months, review medications on each subsequent visit Reinforce adherence to the atherosclerosis treatment regimen

A nonfasting lipid panel obtained in the first 6-12 hours after the onset of acute myocardial infarction has been

shown to be relatively accurate. Subsequently, the acute phase reaction, which can begin at 12-24 hours and can take up to 6 weeks to reverse, can lower LDL levels by 25-50%. Lipid panels obtained 12 hours or more after an acute event or after CABG should be interpreted caution, recognizing the true baseline LDL is likely to be much higher requiring a higher statin dose to achieve LDL < 70 mg/dL. If a lipid panel has not been obtained on admission or in the first few hours of hospitalization, empiric statin initiation and dosing is recommended.

Comprehensive Risk Reduction for Outpatients with Atherosclerosis or Diabetes

There are four classes of medications that have been proven to reduce cardiovascular events and mortality in patients with coronary, other vascular disease, and diabetes. It is recommended that patients with coronary, other vascular disease, and/or diabetes be treated with all four medications, unless contraindications exist or treatment is not tolerated. Individualization of therapy depending on other medical issues and risk of side effects, may be appropriate in certain circumstances. If a patient is not treated with one or more of these medications, it is recommended that the reason be documented in the medical record. The benefits of combination medical therapy with regards to the reduction in the risk of MI, stroke, rehospitalization, need for revascularization, and death continue long term. Since patients with clinically evident atherosclerosis remain at life long risk, life long treatment with each agent is recommended, so long as it well tolerated.

Evidence-based, Mortality Reducing Therapy for Patients with Atherosclerosis or Diabetes:

<u>Aspirin and/or clopidogrel</u>	All patients with atherosclerosis or diabetes, life long therapy*
<u>Beta blocker</u>	All patients with atherosclerosis or diabetes, life long therapy*
<u>ACE inhibitor</u>	All patients with atherosclerosis or diabetes, life long therapy*
<u>Statin</u>	All patients with atherosclerosis or diabetes, life long therapy*
<u>Omega-3 fatty acid</u>	All patients with atherosclerosis or diabetes, life long therapy*

* unless contraindicated, not tolerated, or reason for not using documented in the medical record

Aldosterone antagonists: Patients who are post MI and LVEF ≤ 0.40, with signs or symptoms or heart failure or diabetes, have reduced mortality risk with aldosterone antagonists (unless contraindicated).

In addition to treatment with the above medications, the following treatment goals should be achieved and maintained, with careful documentation in the medical record:

LDL < 70 mg/dL	Once achieved, document with biannual or annual lipid panel (Secondary goal HDL > 40 mg/dL, Triglycerides < 150 mg/dL)
BP < 140/90 mmHg	Document on each follow-up visit, with additional monitoring as indicated
BP < 130/80 mmHg	If diabetes or renal failure (if diabetes and renal insufficiency BP < 125/75)
No smoking	Current status with regards to smoking should be documented in all current/former smokers. Recommendation for smoking cessation and nicotine replacement/Zyban®/behavior modification attempts should be documented
HbA1C <7.0%	Diabetes management, tight control in diabetics
30-60 min, daily Physical activity	
BMI 21-25 kg/m ²	Achieve weight goal via Mediterranean or therapeutic lifestyle change (TLC) diet.

Medical Regimen for Patients with Atherosclerosis

Aspirin and/or Clopidogrel: Antiplatelet therapy reduces the risk of vascular events in patients with atherosclerosis. Patients should continue on ASA, 81 mg to 162 mg per day indefinitely after discharge. Contraindications include true aspirin allergy with nasal polyposis and active bleeding. Patients with acute coronary syndromes should be treated with combined aspirin and clopidogrel (75 mg daily) for 12 months or

indefinitely. Patients that have contraindications or intolerance to ASA should be treated with **clopidogrel** 75 mg daily. Patients with a recurrent event despite ASA should be considered for aspirin plus clopidogrel treatment. *In patients with coronary artery disease, ASA lowers the risk of myocardial infarction, unstable angina, need for revascularization, and death. Pooling data from the four largest trials suggests a 48% reduction in the risk of myocardial infarction and a 51% reduction in the risk of death. This benefit continues beyond ten years. CURE demonstrated the additional benefit of 3 to 12 months of clopidogrel in combination with aspirin in acute coronary syndrome patients.*

Statins and other lipid lowering agents: Statins have potent vascular and cardiac protective effects. Statins are indicated in all patients with atherosclerosis or diabetes. Statins reduce vascular inflammation and stabilize the vulnerable atherosclerotic plaque, thereby markedly reducing the risk of vascular events. These benefits are seen in patients with cholesterol and LDL levels in the low, normal, and high range. Clinical trials have shown mortality reduction in patients with baseline LDL levels of 70 mg/dL and above. Initiation of statin therapy in patients with documented atherosclerosis results in a reduction in myocardial infarction, unstable angina, stroke, need for revascularization, hospitalization, and all cause mortality compared to patients treated with diet alone. This is true regardless of whether the patient has undergone CABG, PTCA, or is being treated medically.

These benefits are seen early such that patients should be started on therapy prior to hospital discharge. Early benefits (within 8 - 16 weeks) can be seen in patients presenting with ACS when started on immediate, high dose potent statin treatment (e.g. atorvastatin 80 mg/d) as shown in MIRACL and PROVE-IT.

The starting dose of statin should be a dose estimated to achieve at least a LDL < 70 mg/dL based on the baseline lipid panel or empiric dosing based on clinical trials. In patients where the baseline LDL is known, the use of the UCLA LDL Treatment to Goal Guide is recommended (Table 1). In ACS patients, high dose potent statin treatment, regardless of baseline LDL is recommended. In non-ACS patients where the baseline LDL is pending or not known, empiric doses may be used. Patients who fail to achieve target lipid levels (**LDL < 70 mg/dL**) at 6 weeks after initiation of therapy should have their dose increased or an additional agent (ezetimibe, niacin, or cholesterol binding resin) added. The combination of a statin and ezetimibe may also be used as first line therapy to achieve LDL goal, with the exception of patients with ACS in whom high dose, potent statin therapy is preferred.

The target lipid levels in patients with AVD or diabetes are LDL cholesterol < 70 mg/dL HDL cholesterol > 40 mg/dL, and triglycerides (TG) < 150 mg/dL. The ideal LDL in all patients is likely LDL < 70 mg/dL (ongoing trials are evaluating this further). The benefits of statins are seen in men and women, older and younger patients, diabetics and nondiabetics. Contraindications include pregnancy or serious underlying liver disease. Obtain baseline LFTs. LDL must be treated to goal first, but if HDL remains below 40 mg/dL or TG remain above 150 mg/dL, specific HDL raising and/or triglyceride lowering interventions such as Niacin, fibrates, or high dose fish oil capsules should be considered (weighing potential benefits with the potential risk of additional side effects and drug interactions). Table 2

Patients with atherosclerosis and/or diabetes will live longer when treated with a HMG CoA Reductase Inhibitor. In the 4S trial there was a 34% risk reduction in major cardiac events, a 42% risk reduction in cardiovascular mortality and a 30% reduction in all cause mortality associated with statin treatment. The LIPID trial demonstrated that even patients with "low or normal" levels of total cholesterol and LDL cholesterol (LDL 70-170 mg/dl) have mortality reduction with statin treatment. The HPS trial demonstrated that patients with LDL < 100 at baseline, derive similar risk reduction to those with higher LDLs. Patients should be educated that these medications are for the treatment of atherosclerosis, not because the patient has "failed" dietary treatment and that use of these medications lowers the risk of recurrent events, need for revascularization, hospitalizations, strokes, and mortality.

ACE Inhibitors: These agents have potent vascular and cardiac protective effects. These agents are indicated

in all patients with atherosclerosis. Patients with coronary, peripheral, cerebral vascular disease, and diabetes have reduced risk of MI, stroke, heart failure, and death when treated with an ACE inhibitor. This is true even if the blood pressure and ejection fraction are normal. All post CABG, post PTCA, post unstable angina, post MI, stable CAD, PVD, CVD, and diabetic patients should receive an ACE inhibitor, unless a specific contraindication is documented. Patients with acute myocardial infarction have improved early survival and less heart failure when treated with ACE inhibitors. All MI patients without contraindications should be started on ACE inhibitors within 12-24 hours and treated long term. Patients with left ventricular dysfunction should be started and maintained on an ACE inhibitor indefinitely. Renal insufficiency in the setting of CAD or diabetes is not a contraindication but rather a double indication for ACE inhibitors. The benefit of ACE inhibitors is independent of blood pressure status. Use target doses. Contraindications include history of angioedema, cardiogenic shock, hyperkalemia, and pregnancy. Angiotensin receptor antagonists should be used in ACEI intolerant patients.

The HOPE and EUROPA trials demonstrated that in patients with CAD, CVD, PVD or diabetes the use of an ACE inhibitor was associated with a reduction in cardiovascular events, cardiovascular mortality, and all cause mortality. The PEACE trial was underpowered. This benefit was seen in patients without hypertension and with normal left ventricular ejection fractions. Long term treatment with ACEI is thus indicated in any patient with atherosclerosis.

Beta Blockers: These agents should be considered in all patients with atherosclerosis, since they reduce the risk of myocardial infarction and make it more likely that a patient will survive an infarction. These agents should be considered first line agents for the symptomatic control of angina. In addition these agents prolong survival in patients with previous myocardial infarction as well as reduce the risk of unstable angina in patients with coronary artery disease. These agents also attenuate the remodeling process post myocardial infarction and reduce the risk of developing heart failure. In a patient with coronary artery disease and hypertension, beta blockers are an excellent first line agent. The duration of benefit with therapy extend indefinitely. Use target doses as clinically tolerated. In patients with LVEF < 0.40 with or without heart failure symptoms, carvedilol is preferred. Contraindications include symptomatic bradycardia, 2nd/3rd degree AV block without pacemaker, cardiogenic shock, acutely decompensated heart failure, severe asthma or COPD, diabetic with recurrent life threatening hypoglycemic episodes. Please note that diabetes, peripheral vascular disease, mild/moderate asthma or COPD, asymptomatic bradycardia, and heart failure are not contraindications and should not preclude the use of beta blockers.

Omega-3 Fatty Acids: Omega-3 fatty acids have been demonstrated to have a variety of cardiovascular protective effects. Fish oil supplementation has been demonstrated in clinical trial to reduce the risk of cardiovascular events by 10 to 20%. This benefit was additive to cardiovascular protective medications. It is recommended that all patients with atherosclerosis or diabetes be treated with omega 3 fatty acid supplementation, with therapy beginning in the hospital. Patients may be treated with fish oil capsules containing 800 to 1000 mg of omega-3 fatty acids (eicosapentaenoic acid, [EPA] and docosahexaenoic acid, [DHA]) PO daily. Alternative supplements include flax seed oil or canola oil.

Aldosterone Antagonists: These agents are indicated in patients with AMI and left ventricular ejection fraction ≤ 0.40 and who have signs or symptoms of heart failure or diabetes, in the absence of contraindications. These agents attenuate remodeling and have been demonstrated to benefit patients with acute myocardial infarction with left ventricular dysfunction with heart failure symptoms. Patients should be clinically stabilized prior to initiation of the aldosterone antagonist. This therapy is only indicated in patients with systolic dysfunction (LVEF ≤ 0.40), not all ACS patients. Start low dose and need to closely monitor potassium levels and renal function. Hyperkalemia is an absolute contraindication. Use extreme caution if Cr > 2.5 mg/dL in men or >2.0 mg/dL in women. Starting either spironolactone at 6.25 mg PO daily with target dose of no more than 25 mg daily or Eplerenone 25 mg daily starting dose with target dose of 50 mg daily. *The EPHEsus trial demonstrated a 15% reduction in mortality with the selective aldosterone antagonist eplerenone in AMI patients with LVEF < 40% with heart failure signs or symptoms.*

Nitrates: These agents should be considered second line agents after beta blockers for the symptomatic control of angina. There is no long term data that nitrates improve prognosis in patients with coronary artery disease so that their use is dictated solely for symptom relief. Patients who are not having symptomatic angina do not need to be routinely discharged on long acting nitrates. When long acting nitrates are indicated, a daily nitrate free interval is necessary to decrease tolerance. Patient should be discharged with prn SL nitroglycerine as well as instructions as to its use.

Calcium channel blockers: These agents decrease chest pain but do not decrease the risk of a cardiac event or improve outcome, independent of blood pressure control. In patients with angina there is an increased risk of coronary events with calcium blockers as compared to angina control with beta blockers. In patients with coronary artery disease and hypertension these agents should be reserved for patients who are intolerant of or fail to have their blood pressure controlled with beta blockers, ACE inhibitors, angiotensin receptor blockers, diuretics, and their combination.

Antiarrhythmic agents: Type I antiarrhythmic agents markedly increase the risk of sudden death in patients with coronary artery disease. This is because all type I antiarrhythmic agents markedly lower the fibrillation threshold of ischemic myocardium. Even when used to maintain sinus rhythm for atrial fibrillation or when guided by EPS or Holter monitoring, these agents increase the risk of overall mortality for CAD patients. These agents should be avoided in all patients with CAD except those with ICDs or in whom the risk benefit ratio has been carefully considered. Amiodarone should be considered the only safe antiarrhythmic agent in patients with CAD. *Compared to placebo amiodarone was neutral with respect to sudden death and mortality in post MI trials.*

Exercise: Patients should receive specific instructions for a minimum of 5 x week aerobic exercise program. Exercise increases HDL, reduces the risk of myocardial infarction, and improves survival in patients with coronary artery disease. Either a home based program or supervised cardiac rehabilitation can be recommended. After AMI or CABG a supervised cardiac rehabilitation program is recommended. Exercise is an essential component of the management of patients with coronary artery disease and is highly effective in preventing subsequent cardiac events. Patients should be offered referral to a cardiac rehabilitation program in their area. In addition to a specific exercise prescription patients require instructions on activities that are permissible and those that should be avoided (e.g. heavy lifting).

Smoking Cessation: Particular attention should be paid to smoking cessation counseling. Patients who continue to smoke after presenting with unstable angina have 5.4 times the risk of death from all causes compared to patients who stop smoking. Patients should be offered intensive smoking cessation intervention during hospitalization. This should include both physician and nurse counseling focusing on relapse prevention. Patients should receive a relapse prevention manual and be given written information about the outpatient behavioral modification programs available and the option of nicotine replacement therapy and/or bupropion (Zyban). The recommendation for smoking cessation should be clearly documented in the medical record.

Diet: Although standard dietary intervention alone has not been shown to be beneficial, other dietary interventions such as the Mediterranean diet may provide benefit. Patients and family members, if available, should receive counseling on the National Cholesterol Education Program TLC diet or Mediterranean diet and recommended body weight (body mass index) during the hospitalization. Information on the outpatient dietary modification programs available should be provided. Supplementation with Omega 3 fatty acids has lowered the risk of recurrent myocardial infarction. Discourage use of very low fat diets.

Patient Education: The patient and his or her family member or advocate should be instructed regarding the use of medications and monitoring of symptoms. The purpose, dose, and major side effects of each medication prescribed should be explained. Written medication sheets and a medication schedule should be provided to each

patient. The warning signs of a heart attack should be discussed with each patient and their immediate plan of action reviewed, including call 911. A patient education sheet should be provided. Patients should be instructed to contact their primary care physician or cardiologist if they have a non-acute change in symptom pattern and discuss whether changes in the management plan are warranted. *Patient delays in seeking medical attention are a major contributor to diminished benefit with reperfusion therapy. Detailed patient education has been demonstrated to reduce the time to treatment in acute myocardial infarction.*

Follow-up: Continuation of the therapies targeting the underlying atherosclerotic disease process markedly improve clinical outcome in patients with atherosclerosis. The continued use of the beneficial therapies prescribed should be strongly reinforced during patient follow-up. The medications the patient is taking should be reviewed on each visit. If one or more of the survival enhancing medications is not prescribed, the specific contraindication or intolerance should be clearly documented in the medical record.

After initial statin treatment, a fasting lipid panel should be obtained at 6 weeks to evaluate whether target lipid levels have been achieved and guide cholesterol lowering medication dosing adjustments. Obtain LFTs at 6 weeks and with any dose escalation. CPK need only be checked if muscular symptoms arise. Document LDL < 70 mg/dL on biannual or annual basis. Document BP and Diabetes control. The need for daily aerobic exercise should be reinforced and the patient's progress monitored. Stress testing does not appear to be indicated in the routine follow-up of patients with coronary artery disease and should, in general, be performed for specific reasons such as a change in symptoms or in following patients with silent ischemia.

Document:

Current medications (if ASA, beta blocker, ACE inhibitor, or statin not currently prescribed, document contraindication, intolerance, or alternative medication utilized)

LDL, HDL, and TG (from within last 1 year)

Current blood pressure

Weight and height (body mass index)

If history of heart failure, LVEF

If diabetes, HbA1c from within last 1 year, annual ophthalmology retinal exam, foot exam and care

If history of smoking, current status and advice to quit smoking

Use of pneumococcal vaccination if heart failure, CAD, diabetes, pneumonia, age > 65.

Annual influenza vaccination

Clinical Guidelines Committee, UCLA Division of Cardiology

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Table 1. UCLA LDL Treatment to Goal Guide

Baseline LDL level	% reduction to LDL < 100 mg/dL	% reduction to ideal goal LDL < 70 mg/dL
80 mg/dL	-	13%

90 mg/dL	-	22%
100 mg/dL	-	30%
110 mg/dL	9%	36%
115 mg/dL	13%	39%
120 mg/dL	17%	42%
125 mg/dL	21%	44%
130 mg/dL	24%	46%
140 mg/dL	29%	50%
150 mg/dL	34%	53%
160 mg/dL	38%	56%
170 mg/dL	42%	59%
180 mg/dL	45%	61%
190 mg/dL	48%	63%
200 mg/dL	50%	65%

Estimated % LDL Reduction of Drug Intervention

Lovastatin 10 mg	22%	Simvastatin 10 mg	25%
Lovastatin 20 mg	25%	Simvastatin 20 mg	31%
Lovastatin 40 mg	31%	Simvastatin 40 mg	38%
Lovastatin 80 mg	41%	Simvastatin 80 mg	45%
Pravastatin 10 mg	22%	Atorvastatin 10 mg	40%
Pravastatin 20 mg	27%	Atorvastatin 20 mg	47%
Pravastatin 40 mg	33%	Atorvastatin 40 mg	53%
Pravastatin 80 mg	39%	Atorvastatin 80 mg	60%
Fluvastatin 20 mg	20%	Rosuvastatin 5 mg	47%
Fluvastatin 40 mg	27%	Rosuvastatin 10 mg	53%
Fluvastatin 80 mg	32%	Rosuvastatin 20 mg	60%
		Rosuvastatin 40 mg	67%
Simvastatin/Ezetimibe 10/10	45%		
Simvastatin/Ezetimibe 10/20	52%		
Simvastatin/Ezetimibe 10/40	56%		
Simvastatin/Ezetimibe 10/80	62%		
Ezetimibe 10 mg	25%	(additional reduction beyond statin alone; statin 10 mg + ezetimibe 10 mg = statin 80 mg)	

Table 2. UCLA HDL Treatment to Goal Guide

Baseline Level	% increase to goal Men <u>HDL > 40 mg/dL</u>	% increase to goal Women <u>HDL > 50 mg/dL</u>	% increase to negative risk factor <u>HDL > 60 mg/dL</u>	<u>HDL</u>
20	100 %	150 %		200 %
25	60 %	100 %		140 %
30	33 %	67 %		100 %
35	14 %	43 %		71 %
40	-	25 %		50 %
45	-	11 %		33 %
50	-	-		20 %
55	-	-		9 %

Estimated % HDL Increase of Drug Intervention

<u>Extended Release Niacin</u>	<u>Fenofibrate</u>	<u>Gemfibrozil</u>	<u>Ezetimibe</u>
500 mg ↑10 %	160 mg tab ↑15 %	600 mg ↑13 %	10 mg ↑1 %
1000 mg ↑15 %	(200 mg cap)		
1500 mg ↑22 %			
2000 mg ↑26 %			

<u>Simvastatin</u>	<u>Lovastatin</u>	<u>Atorvastatin</u>	<u>Pravastatin</u>
10 mg ↑5 %	10 mg ↑4 %	10 mg ↑6 %	10 mg ↑3 %
20 mg ↑6 %	20 mg ↑6 %	20 mg ↑5 %	20 mg ↑5 %
40 mg ↑7 %	40 mg ↑5 %	40 mg ↑4 %	40 mg ↑6 %
80 mg ↑8 %	60 mg ↑5 %	80 mg ↑2 %	80 mg ↑4 %

<u>Fluvastatin</u>	<u>Rosuvastatin</u>	<u>Simvastatin/Ezetimibe</u>
20 mg ↑3 %	5 mg ↑8 %	10/10 mg ↑6 %
40 mg ↑4 %	10 mg ↑8 %	10/20 mg ↑8 %
80 mg ↑6 %	20 mg ↑10 %	10/40 mg ↑10 %
	40 mg ↑12 %	10/80 mg ↑12 %

Extended Release Niacin/Lovastatin

1000/20 mg	↑20 %
1000/40 mg	↑20 %
1500/40 mg	↑27 %
2000/40 mg	↑30 %