HYPERLIPIDEMIA

Detection, evaluation and treatment of high cholesterol

ATP III guidelines: Quick desk reference

STEP 1: Determine lipoprotein levels—obtain complete lipoprotein profile after nine—to 12-hour fast.

ATP III classification of LDL, total and HDL cholesterol (mg/dL)

LDL cholesterol: Primary target of therapy	
<100	Optima
100-129	Near optimal/above optimal
130-159	Borderline high
160-189	High
≥190	Very high
Total cholesterol	
<200	Desirable
200-239	Borderline high
≥240	High
HDL cholesterol	
<40	Low
≥60	High

STEP 2: Identify presence of clinical atherosclerotic disease that confers high risk for coronary heart disease (CHD) events (CHD risk equivalent):

- Clinical CHD
- Symptomatic carotid artery disease
- Peripheral arterial disease
- Abdominal aortic aneurysm

STEP 3: Determine presence of major risk factors (other than LDL).

Major risk factors (exclusive of LDL cholesterol) that modify LDL goals

- Cigarette smoking
- Hypertension (BP ≥140/90 mmHg or on antihypertensive medication)
- Low HDL cholesterol (<40 mg/dl)*
- Family history of premature CHD (CHD in male first degree relative <55 years; CHD in female first degree relative <65 years)
- Age (men ≥45 years; women ≥55 years)

*HDL cholesterol 60 mg/dL counts as a "negative" risk factor; its presence removes one risk factor from the total count.

Note: In ATP III, diabetes is regarded as a CHD risk equivalent.

STEP 4: If 2+ risk factors (other than LDL) are present without CHD or CHD risk equivalent, assess 10-year (short-term) CHD risk.

Three levels of 10-year risk:

- >20% — CHD risk equivalent
- 10–20%
- <10%

STEP 5: Determine risk category:

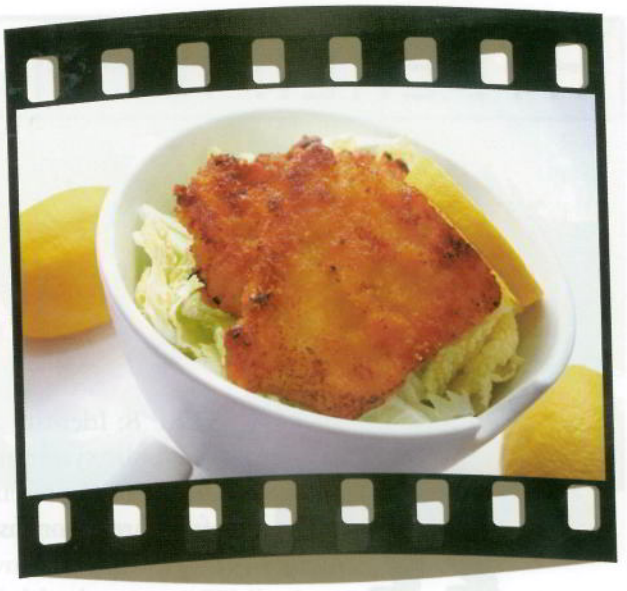
- Establish LDL goal of therapy
- Determine need for therapeutic lifestyle changes (TLC)
- Determine level for drug consideration

LDL cholesterol goals and cutpoints for therapeutic lifestyle changes (TLC) and drug therapy in different risk categories

Risk category	LDL goal	LDL level at which to initiate therapeutic lifestyle changes (TLC)	LDL level at which to consider drug therapy
CHD or CHD risk equivalents (10-year risk >20%)	<100 mg/dL	≥100 mg/dL	≥130 mg/dL (100-129 mg/dL: drug optional)*
2+ risk factors (10-year risk ≤20%)	<130 mg/dL	≥130 mg/dL	10-year risk 10-20%: ≥130 mg/dL 10-year risk <10%: ≥160 mg/dL
0-1 risk factor**	<160 mg/dL	≥160 mg/dL	≥190 mg/dL (160-189 mg/dL: LDL-lowering drug optional)

*Some authorities recommend use of LDL-lowering drugs in this category if an LDL cholesterol <100 mg/dL cannot be achieved by therapeutic lifestyle changes. Others prefer use of drugs that primarily modify triglycerides and HDL, e.g., nicotinic acid or fibrate. Clinical judgment also may call for deferring drug therapy in this subcategory.

**Almost all people with 0-1 risk factor have a 10-year risk <10%, thus 10-year risk assessment in people with 0-1 risk factor is not necessary.



STEP 6: Initiate therapeutic lifestyle changes (TLC) if LDL is above goal

TLC features
• TLC diet
• Saturated fat <7% of calories, cholesterol <200 mg/day
• Consider increased viscous (soluble) fiber (10-25 g/day) and plant stanols/sterols (2g/day) as therapeutic options to enhance LDL lowering
• Weight management
• Increased physical activity

STEP 7: Consider adding drug therapy if LDL exceeds levels shown in Step 5 table:
- Consider drug simultaneously with TLC for CHD and CHD equivalents
- Consider adding drug to TLC after three months for other risk categories

Drugs affecting lipoprotein metabolism

Drug class	Agents and daily doses	Lipid/lipoprotein effects	Side effects	Contraindications
HMG CoA reductase inhibitors (statins)	Lovastatin (20-80 mg), Pravastatin (20-40 mg), Simvastatin (20-80 mg), Fluvastatin (20-80 mg), Atorvastatin (10-80 mg), Cerivastatin (0.4-0.8 mg)	LDL-C ↓18-55% HDL-C ↑5-15% TG ↓7-30%	Myopathy Increased liver enzymes	Absolute: • Active or chronic liver disease Relative: • Concomitant use of certain drugs*
Bile acid sequestrants	Cholestyramine (4-16 g) Colestipol (5-20 g) Colesevelam (2.6-3.8 g)	LDL-C ↓15-30% HDL-C ↑3-5% TG No change or increase	Gastrointestinal distress Constipation Decreased absorption of other drugs	Absolute: • Dysbeta-lipoproteinemia • TG >400 mg/dL Relative: • TG >200 mg/dL
Nicotinic acid	Immediate release (crystalline) nicotinic acid (1.5-3 gm), extended release nicotinic acid (Niaspan®) (1-2 g), sustained release nicotinic acid (1-2 g)	LDL-C ↓5-25% HDL-C ↑15-35% TG ↓20-50%	Flushing Hyperglycemia Hyperuricemia (or gout) Upper GI distress Hepatotoxicity	Absolute: • Chronic liver disease • Severe gout Relative: • Diabetes • Hyperuricemia • Peptic ulcer disease
Fibric acids	Gemfibrozil (600 mg BID) Fenofibrate (200 mg) Clofibrate (1000 mg BID)	LDL-C ↓5-20% (may be increased in patients with high TG) HDL-C ↑10-20% TG ↓20-50%	Dyspepsia Gallstones Myopathy	Absolute: • Severe renal disease • Severe hepatic disease

* Cyclosporine, macrolide antibiotics, various anti-fungal agents and cytochrome P-450 inhibitors (fibrates and niacin should be used with appropriate caution).