

**National Heart, Lung, and Blood
Institute**

**National Cholesterol Education
Program**

Perspectives and Guidelines

National Cholesterol Education Program Coordinating Committee

Agency for Healthcare Research and
Quality

American Academy of Family
Physicians

American Academy of Insurance
Medicine

American Academy of Pediatrics

American Association of Occupational
Health Nurses

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Prevention

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Institute

National Medical Association

NHLBI Ad Hoc Committee on Minority
Populations

Office of Disease Prevention and
Health Promotion

Society for Nutrition Education

Society for Public Health Education

U.S. Department of Agriculture

U.S. Department of Defense

U.S. Department of Veterans
Affairs (VA)

U.S. Food and Drug Administration

CHD Outcomes in Clinical Trials of LDL Cholesterol-Lowering Therapy

Intervention	No. trials	No. treated	Person-years	Mean cholesterol reduction (%)	CHD Incidence (% change)	CHD Mortality (% change)
Surgery	1	421	4,084	22	-43	-30
Sequestrants	3	1,992	14,491	9	-21	-32
Diet	6	1,200	6,356	11	-24	-21
Statins	12	17,405	89,123	20	-30	-29

Source: This table is adapted from the meta-analysis of Gordon, 2000.

Risk Assessment

Count major risk factors

- For patients with multiple (2+) risk factors
 - Perform 10-year risk assessment
- For patients with 0–1 risk factor
 - 10 year risk assessment not required
 - Most patients have 10-year risk <10%

Major Risk Factors (Exclusive of LDL Cholesterol) That Modify LDL Goals

- Cigarette smoking
- Hypertension (BP \geq 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 \geq 45 years; women \geq 55 years)

[†] HDL cholesterol \geq 60 mg/dL counts as a “negative” risk factor; its presence removes one risk factor from the total count.

Diabetes

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

CHD Risk Equivalents

- Risk for major coronary events equal to that in established CHD
- 10-year risk for hard CHD >20%

Hard CHD = myocardial infarction + coronary death

Diabetes as a CHD Risk Equivalent

- 10-year risk for CHD \cong 20%
- High mortality with established CHD
 - High mortality with acute MI
 - High mortality post acute MI

CHD Risk Equivalents

- Other clinical forms of atherosclerotic disease (peripheral arterial disease, abdominal aortic aneurysm, and carotid artery disease [symptomatic or >50% stenosis])
- Diabetes
- Multiple risk factors that confer a 10-year risk for CHD >20%

Three Categories of Risk that Modify LDL-Cholesterol Goals

<u>Risk Category</u>	<u>LDL Goal (mg/dL)</u>
CHD and CHD risk equivalents	<100
Multiple (2+) risk factors	<130
Zero to one risk factor	<160

LDL Cholesterol Goals and Cutpoints for Therapeutic Lifestyle Changes (TLC) and Drug Therapy in Different Risk Categories

Risk Category	LDL Goal (mg/dL)	LDL Level at Which to Initiate Therapeutic Lifestyle Changes (TLC) (mg/dL)	LDL Level at Which to Consider Drug Therapy (mg/dL)
CHD or CHD Risk Equivalents (10-year risk >20%)	<100	≥100	≥130 (100–129: drug options)
2+ Risk Factors (10-year risk ≤20%)	<130	≥130	10-year risk 10–20%: ≥130
			10-year risk <10%: ≥160
0–1 Risk Factor	<160	≥160	≥190 (160–189: LDL-lowering drug optional)

LDL Cholesterol Goals and Cutpoints for Therapeutic Lifestyle Changes (TLC) and Drug Therapy in Different Risk Categories

Risk Category	LDL Goal (mg/dL)	LDL Level at Which to Initiate Therapeutic Lifestyle Changes (TLC) (mg/dL)	LDL Level at Which to Consider Drug Therapy (mg/dL)
CHD or CHD Risk Equivalents (10-year risk >20%)	<100 (optional goal: <70)	≥100	≥100 (<100: drug options)
2+ Risk Factors (10-year risk ≤20%)	<130	≥130	10-year risk 10–20%: ≥130 (100-129: drug options)
			10-year risk <10%: ≥160
0–1 Risk Factor	<160	≥160	≥190 (160–189: LDL-lowering drug optional)

Therapeutic Lifestyle Changes in LDL-Lowering Therapy

Major Features

- TLC Diet
 - Reduced intake of cholesterol-raising nutrients (same as previous Step II Diet)
 - ◆ Saturated fats <7% of total calories
 - ◆ Dietary cholesterol <200 mg per day
 - LDL-lowering therapeutic options
 - ◆ Plant stanols/sterols (2 g per day)
 - ◆ Viscous (soluble) fiber (10–25 g per day)
- Weight reduction
- Increased physical activity

Benefit Beyond LDL Lowering: The Metabolic Syndrome as a Secondary Target of Therapy

General Features of the Metabolic Syndrome

- Abdominal obesity
- Atherogenic dyslipidemia
 - Elevated triglycerides
 - Small LDL particles
 - Low HDL cholesterol
- Raised blood pressure
- Insulin resistance (\pm glucose intolerance)
- Prothrombotic state
- Proinflammatory state

Diagnosis of the Metabolic Syndrome

Any 3 of the following:

- Waist circumference >40 inches (men), >35 inches (women)
- Triglycerides ≥ 150 mg/dL
- HDL <40 mg/dL (men), <50 mg/dL (women)
- BP $\geq 130/\geq 85$ mm Hg
- Fasting glucose ≥ 100 mg/dL

Metabolic Syndrome (continued)

Therapeutic Objectives

- To reduce underlying causes
 - Overweight and obesity
 - Physical inactivity
- To treat associated lipid and non-lipid risk factors
 - Hypertension
 - Prothrombotic state
 - Atherogenic dyslipidemia (lipid triad)

Executive Summary of the Third Report of the National Cholesterol Education Program (NCEP) Expert Panel on Detection, Evaluation, and Treatment of High Blood Cholesterol in Adults (Adult Treatment Panel III)

Expert Panel on Detection, Evaluation, and Treatment of High Blood Cholesterol in Adults

THE THIRD REPORT OF THE Expert Panel on Detection, Evaluation, and Treatment of High Blood Cholesterol in Adults (Adult Treatment Panel III, or ATP III) constitutes the National Cholesterol Education Program's (NCEP's) updated clinical guidelines for cholesterol testing and management. The full ATP III document is an evidence-based and extensively referenced report that provides the scientific rationale for the recommendations contained in the executive summary. ATP III builds on previous ATP reports and expands the indications for intensive cholesterol-lowering therapy in clinical practice. It should be noted that these guidelines are intended to inform, not replace, the physician's clinical judgment, which must ultimately determine the appropriate treatment for each individual.

BACKGROUND
The third ATP report updates existing recommendations for the management of high blood cholesterol. The NCEP produces ATP clinical guidelines supported by advances in cholesterol management. The guideline reports—ATP I, II, and III—have been instrumental in reducing the burden of cardiovascular disease.

See also p 2508 and Patient Education page 2486

has a major thrust. ATP I outlined a strategy for primary prevention of coronary heart disease (CHD) in persons with high levels of low-density lipoprotein (LDL) cholesterol (≥ 160 mg/dL) or those with borderline high LDL cholesterol (130-159 mg/dL) and multiple (2+) risk factors. ATP II affirmed the importance of this approach and added a new feature: the intensive management of LDL cholesterol in persons with established CHD. For patients with CHD, ATP II set a new lower LDL cholesterol goal of < 100 mg/dL. ATP III adds a call for more intensive LDL-lowering therapy in certain groups of people, in whom recent clinical trials¹ are based on ATP III. The importance of the ATP III recommendations is based on the previous reports and the ATP III document.

High Blood Cholesterol What you need to know



Why is Cholesterol Important?
Your blood cholesterol level has a lot to do with your chances of getting a heart disease. High cholesterol is one of the major risk factors for heart disease. It can lead to atherosclerosis, which is the buildup of fatty deposits in the arteries. This can narrow the arteries and lead to a heart attack or stroke.

How Do I Know if I Have High Blood Cholesterol?
The only way to know if you have high blood cholesterol is to get a blood test. Your doctor can order a blood test to check your cholesterol levels.

NOTE:
What Affects Your Cholesterol Number?
What Affects Your Risk of Developing or Having a Heart Attack?
Lowering Cholesterol With Therapeutic Lifestyle Changes (TLC)

ATP III Guidelines At-A-Glance Quick Desk Reference

Step 1 Determine lipoprotein levels—obtain complete lipoprotein profile after 9- to 12-hour fast.

ATP III Classification of LDL, Total, and HDL Cholesterol (mg/dL)	
LDL Cholesterol - Primary Target of Therapy	
< 100	Optimal
100-129	Near optimal/borderline 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 $\geq 160/90$ mmHg or on antihypertensive medications)
 - Low HDL cholesterol (< 40 mg/dL)*
 - Family history of premature 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.

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To Access the NHLBI/NCEP Cholesterol Clinical Web Resources:
<http://www.nhlbi.nih.gov>

Look in the Highlights section for:
• ATP III Cholesterol Guidelines

Click on this link for materials available for Professionals and Patients.

ATP III Related Information

For Patients:

- Live Healthier, Live Longer Web Site
- New Booklet: "High Blood Cholesterol—What You Need To Know"
- 10-year CHD Risk Calculator
- Other Cholesterol-Related Information