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Using the new cholesterol guidelines in everyday practice

ABSTRACT

The third Adult Treatment Panel guidelines from the National Cholesterol Education Program, released in May 2001, depart from previous guidelines in several ways. As in previous guidelines, treatment and treatment goals are based not only on lipid levels but also on the patient's risk status. The method for calculating risk, however, has been refined considerably. Patients are classified in the highest-risk group if they have any of these disorders: known coronary artery disease, diabetes mellitus, peripheral vascular disease, abdominal aortic aneurysm, carotid artery disease, or a 10-year risk of a coronary event of more than 20% (as determined by use of a scoring method).

KEY POINTS

Beginning at age 20, people should have a fasting lipid profile (total cholesterol, low-density lipoprotein [LDL], high-density lipoprotein [HDL], and triglycerides) obtained every 5 years.

Elevated triglycerides (≥ 200 mg/dL) should be treated more aggressively than previously recommended.

Patients with the metabolic syndrome, also known as syndrome X, should be identified and treated aggressively.

Recommended dietary interventions are more aggressive than in the past, and call for the use of foods containing plant stanols and sterols.

Hormone replacement therapy is not recommended as a substitute for approved lipid-lowering drugs.



PATIENT INFORMATION

Cholesterol: What you need to know, page 623

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MANY MORE PATIENTS are candidates for intensive lipid-lowering therapy under new guidelines recently released by the third Adult Treatment Panel (ATP III) of the National Cholesterol Education Program.¹

This is good. By using a more sophisticated method of identifying patients at high risk (who should undergo intensive treatment), the ATP III guidelines should help reduce the incidence of coronary events. On the other hand, however, many physicians may initially find the risk-stratification scheme—derived from Framingham data—and the treatment algorithm a bit cumbersome for use in busy everyday practice.

Here is an overview of the new guidelines and how they differ from the 1993 guidelines (ATP II),² along with our comments and suggestions on how to set up a system to use them in your practice.

OBTAIN A FASTING LIPID PROFILE EVERY 5 YEARS

Like the old guidelines, the new guidelines call for lipid testing at least every 5 years after age 20. However, the new guidelines recommend obtaining a fasting lipid profile, which includes total cholesterol, low-density lipoprotein (LDL), high-density lipoprotein (HDL), and triglycerides. The old guidelines recommended nonfasting measurements of total cholesterol and HDL only.

If any of these levels are abnormal, the physician should evaluate the patient for causes of secondary dyslipidemia, including diabetes, hypothyroidism, obstructive liver disease, chronic renal failure, and drugs that increase LDL and decrease HDL (progestins, anabolic steroids, and corticosteroids).

How to determine the goal LDL level and whether to start drug therapy

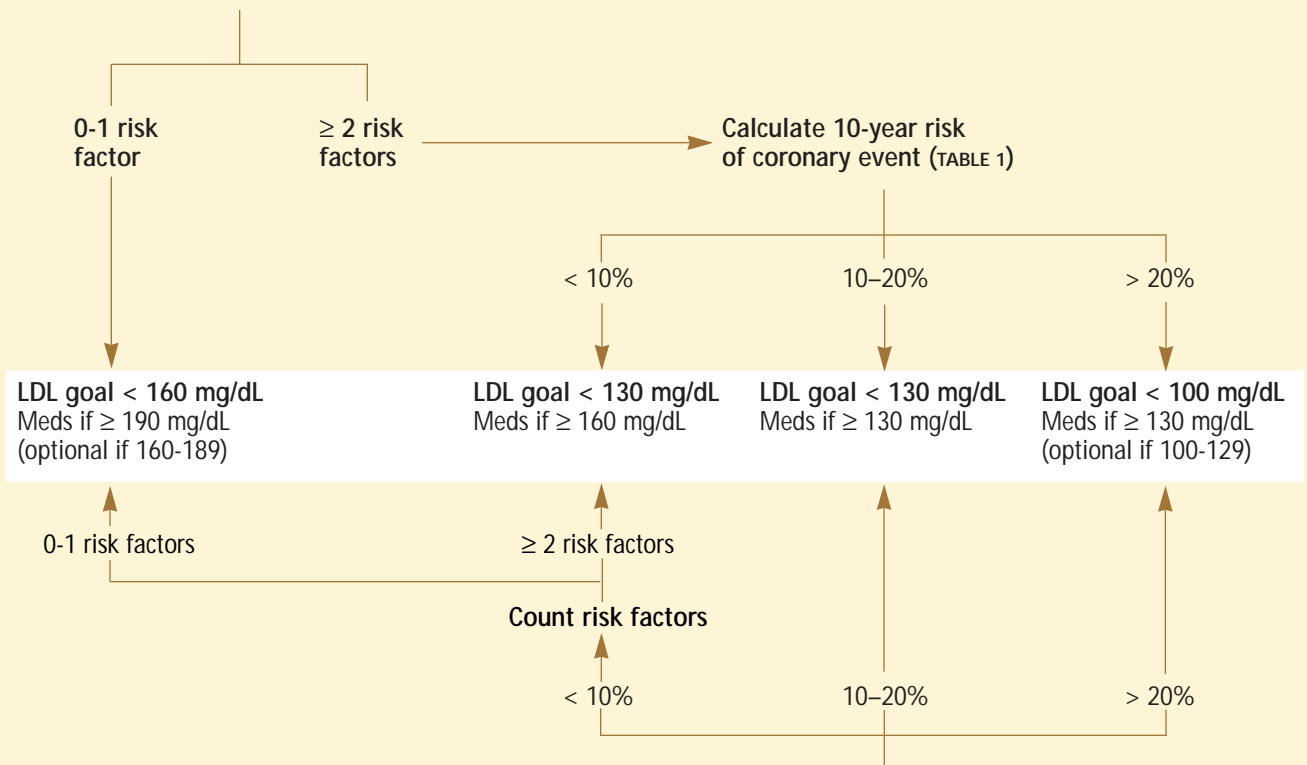
If any

- Coronary artery disease
- Peripheral vascular disease
- Abdominal aortic aneurysm
- Symptomatic carotid disease
- Diabetes mellitus

LDL goal < 100 mg/dL
Meds if ≥ 130 mg/dL
(optional if 100-129)

If none of the above, count risk factors*

- Hypertension (blood pressure ≥ 140/90 mm Hg or taking meds)
- Cigarette smoking
- HDL < 40 mg/dL (subtract 1 risk factor if HDL is ≥ 60)
- Age ≥ 40 years (men) or ≥ 55 years (women)
- Family history of coronary artery disease (before age 55 in a male first-degree relative or before age 65 in a female first-degree relative)



*Alternatively, calculate 10-year risk of coronary event (TABLE 1) before counting risk factors

If LDL goal is reached, treat secondary targets

Triglycerides. If triglyceride level is ≥ 200 mg/dL, calculate non-HDL level (total cholesterol minus HDL); goal is 30 mg/dL higher than the LDL goal

Metabolic syndrome. If three or more of the following are present, treat with weight reduction, increased physical activity, antihypertensive treatment (if blood pressure is elevated), aspirin (if coronary disease is present), and therapy to reduce triglycerides and raise HDL levels

- Waist > 40 inches (men) or > 35 inches (women)
- Triglyceride level ≥ 150 mg/dL
- HDL level < 40 mg/dL (men) or < 50 mg/dL (women)
- Blood pressure ≥ 130/85 mm Hg
- Glucose level ≥ 110 mg/dL

FIGURE 1



TABLE 1

How to calculate 10-year risk of coronary events

1 DETERMINE THE PATIENT'S TOTAL POINTS

AGE (YEARS)	POINTS	
	MEN	WOMEN
20-34	-9	-7
35-39	-4	-3
40-44	0	0
45-49	3	3
50-54	6	6
55-59	8	8
60-64	10	10
65-69	11	12
70-74	12	14
75-79	13	16

2 DETERMINE THE PATIENT'S 10-YEAR RISK

PATIENT'S POINTS	
Age	_____
Total cholesterol	_____
Smoking	_____
HDL	_____
Systolic blood pressure	_____
Total points	_____

TOTAL CHOLESTEROL (MG/DL)	POINTS									
	AGE 20-39		AGE 40-49		AGE 50-59		AGE 60-69		AGE 70-79	
	M	W	M	W	M	W	M	W	M	W
< 160	0	0	0	0	0	0	0	0	0	0
160-199	4	4	3	3	2	2	1	1	0	1
200-239	7	8	5	6	3	4	1	2	0	1
240-279	9	11	6	8	4	5	2	3	1	2
≥ 280	11	13	8	10	5	7	3	4	1	2

POINT TOTAL	10-YEAR RISK (%)	
	MEN	WOMEN
< 0	< 1	< 1
0-4	1	< 1
5-6	2	< 1
7	3	< 1
8	4	< 1
9	5	1
10	6	1
11	8	1
12	10	1
13	12	2
14	16	2
15	20	3
16	25	4
17	30	5
18	> 30	6
19	> 30	8
20	> 30	11
21	> 30	14
22	> 30	17
23	> 30	22
24	> 30	27
≥ 25	> 30	≥ 30

SMOKING STATUS	POINTS									
	AGE 20-39		AGE 40-49		AGE 50-59		AGE 60-69		AGE 70-79	
	M	W	M	W	M	W	M	W	M	W
Nonsmoker	0	0	0	0	0	0	0	0	0	0
Smoker	8	9	5	7	3	4	1	2	1	1

HDL (MG/DL)	POINTS, MEN AND WOMEN
≥ 60	-1
50-59	0
40-49	1
< 40	2

SYSTOLIC BLOOD PRESSURE (MM HG)	POINTS			
	IF UNTREATED		IF TREATED	
	M	W	M	W
< 120	0	0	0	0
120-129	0	1	1	3
130-139	1	2	2	4
140-159	1	3	2	5
≥ 160	2	4	3	6

ADAPTED FROM EXPERT PANEL ON DETECTION, EVALUATION, AND TREATMENT OF HIGH BLOOD CHOLESTEROL IN ADULTS. 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). JAMA 2001; 285:2486-2497.

■ CATEGORIZE PATIENTS ACCORDING TO RISK

Elevated levels of LDL are a major cause of coronary artery disease, and LDL-lowering therapy reduces the risk. Yet, as one of us pointed out in an earlier editorial in this journal,³ the reduction in risk may not be clinically relevant in patients at low risk to begin with. You get more bang for your buck by treating patients at higher risk.

Moreover, coronary artery disease is multifactorial: LDL is not the only risk factor, and the LDL level should not be the only criterion for treatment.

Both the ATP II and the ATP III guidelines divided patients into high, intermediate, and low risk categories. A major difference between the reports is in how to assess the risk.

■ PATIENTS AT HIGH RISK: TREAT TO REACH AGGRESSIVE GOALS

Both the old and the new guidelines recommend starting dietary therapy for anyone in the highest risk category whose LDL level is greater than 100 mg/dL, and starting drug therapy if the LDL level is 130 mg/dL or higher, with a goal level of less than 100 mg/dL. The new guidelines further state that drug therapy is “optional” for patients in this group with LDL levels between 100 and 130.

Under the old guidelines, however, only patients with coronary artery disease were in this group. Under the new guidelines, patients are classified as being at high risk if they have any of the following, which carry the same risk as coronary artery disease and are called coronary heart disease risk equivalents (FIGURE 1):

- Coronary artery disease
- Diabetes mellitus
- Peripheral vascular disease
- Carotid artery disease
- Abdominal aortic aneurysm
- A calculated 10-year risk of a coronary event greater than 20% (see TABLE 1 for how to calculate risk or use the program available online at www.nhlbi.nih.gov/guidelines/cholesterol/profmats.htm).

■ PATIENTS AT INTERMEDIATE RISK: TREAT TO REACH INTERMEDIATE GOALS

Patients fall into the intermediate category if they have two or more of the following risk factors:

- Blood pressure 140/90 mm Hg or higher or on treatment for high blood pressure
- Cigarette smoking
- An HDL level lower than 40 mg/dL (up from 35 mg/dL in the previous guidelines)
- Age older than 45 years (men) or 55 years (women)
- A male first-degree family member with coronary artery disease before the age of 55 years or a female first-degree family member with coronary artery disease before the age of 65 years

On the other hand, a high HDL level (\geq 60 mg/dL) is considered a “negative risk factor” and removes one risk factor from the total count.

For patients in this category the LDL goal is less than 130 mg/dL. Lifestyle changes should be started if the LDL level is 130 or greater. Drug therapy should be considered if the patient’s calculated 10-year risk is 10% to 20% and the LDL level is 130 or greater, or if the patient’s calculated 10-year risk is less than 10% and his or her LDL level is 160 or greater.

The calculation of 10-year risk (TABLE 1) is a new feature. Although the primary method of risk-stratifying patients and determining treatment goals is by counting their risk factors, one should calculate the 10-year risk if the patient has two or more risk factors. Alternatively, one can first calculate the 10-year risk and then count risk factors if the risk is less than 10% (FIGURE 1).

■ PATIENTS AT LOW RISK: TREAT TO REACH MODEST GOALS

Patients with fewer than two risk factors have a goal LDL level of less than 160 mg/dL and should start lifestyle changes if the LDL is higher than this. Patients should be considered for drug therapy at an LDL level of 190 mg/dL or higher or if the LDL remains higher than 160 despite a 3-month trial of nonpharmacologic treatment. (Drug therapy is optional in the 160–189 mg/dL range.)

Diabetes confers the same risk as proven coronary disease



■ WHAT ELSE IS NEW?

Therapeutic lifestyle changes upgraded

The new guidelines go farther than the old ones in their recommendations on therapeutic lifestyle changes (TLC).

Whereas the old guidelines included a less-intensive (step I) diet and a more-intensive (step II) diet, the new guidelines skip step I altogether. The new TLC diet calls for daily intake of less than 7% of calories from saturated fat, less than 200 mg of dietary cholesterol, and 25% to 35% of daily calories from total fat, provided most is from unsaturated fat.

It also encourages eating foods that contain plant stanols and sterols (eg, certain margarines and salad dressings) or soluble fiber (eg cereal grains, beans, peas, legumes, fruits, and vegetables).

In addition, the TLC program calls for weight control and increased physical activity.

Metabolic syndrome identified

The ATP III guidelines identify the metabolic syndrome (also known as insulin resistance or syndrome X) as a secondary target of therapy. The metabolic syndrome is diagnosed if a person has three or more of the following:

- Abdominal obesity (waist circumference > 40 inches in men or 35 inches in women)
- Elevated triglycerides (≥ 150 mg/dL)
- Low HDL (< 40 mg/dL in men or < 50 mg/dL in women)
- High-normal or high blood pressure ($\geq 130/85$ mm Hg)
- Fasting glucose ≥ 110 mg/dL.

Treatment for metabolic syndrome is to intensify weight management, increase physical activity, treat hypertension, use aspirin for patients with coronary artery disease, and treat elevated triglycerides or low HDL levels.

More-aggressive treatment of triglycerides

The ATP III report has tightened its categories of triglyceride levels:

- < 150 mg/dL—Normal (down from 200 in the ATP II report)
- 150–199 mg/dL—Borderline high (down from 200–400)

- 200–499 mg/dL—High (down from 400–1,000)
- ≥ 500 mg/dL—Very high (down from 1,000).

Although the primary focus of therapy is on LDL, the ATP III report recommends treating elevated triglycerides with intensified weight management and increased physical activity.

Furthermore, if the triglyceride level remains 200 mg/dL or higher after the LDL goal is reached, the ATP III report recommends setting a secondary goal based on “non-HDL,” ie, the total cholesterol level minus the HDL level. This is based on the recognition that all non-HDL particles are potentially atherogenic. The non-HDL goal should be 30 mg/dL higher than the LDL goal.

Hormone replacement therapy does not replace lipid-lowering drugs

Although hormone replacement therapy reduces LDL levels, studies have not shown that it reduces the risk for coronary events. Therefore, the ATP III guidelines advise against using hormone replacement therapy as an alternative to lipid-lowering drugs.

■ HOW TO APPLY THE NEW GUIDELINES

The new guidelines are based on findings from clinical trials. They tailor the aggressiveness of treatment to the patient’s overall risk. They constitute an advance over the previous guidelines, and should help reduce the incidence of coronary events—but only if physicians follow them.

And there is the rub. The previous guidelines were poorly followed, and they were considerably simpler and less time-consuming than the new guidelines. How can busy physicians hope to incorporate the new guidelines into their practice?

Here are some suggestions.

Set up a system. Use protocols under which your office staff can take over some of the tasks such as interviewing the patient, calculating their risk, instructing them about diet and exercise, and scheduling them for return visits. (See **Patient Information, “Cholesterol: What you need to know,” page 623.**)

Refer the patient to a specialized lipid clinic, if one is available.

The new guidelines tailor treatment to overall risk



Use technology. The web site of the National Heart, Lung, and Blood Institute (www.nhlbi.nih.gov/guidelines/cholesterol/profmats.htm) has the program for calculating risk, which you can use online or download to your personal computer (the downloadable version requires Microsoft Excel 95 or 2000 or a comparable spreadsheet program). The web site also has the same program for use in personal digital assistant devices that use the Palm OS operating system. Alternatively, you can make copies of the relevant tables and keep them in the examination room.

Remember the important points. The following is our own opinion, and not that of the National Heart, Lung, and Blood Institute. But if the new guidelines prove overly burdensome to follow in their entirety, at least try to keep in mind the important points:

- People with coronary artery disease are at high risk and should have an LDL goal of less than 100 mg/dL.
- People with diabetes, peripheral vascular disease, or carotid artery disease have a risk equivalent to that of people with coronary artery disease and should also have an LDL goal of less than 100 mg/dL.
- As for other patients, count their risk factors. If they have two or more, we would begin treatment if the LDL level is 130 mg/dL or higher, with goal LDL of less than 130. This may include a few more people than if the ATP III guidelines were followed strictly, but we believe it is more appropriate to treat a few more people more aggressively than not to treat some people who need it.

■ DO THE NEW GUIDELINES GO FAR ENOUGH?

The new guidelines are based on estimates of 10-year risk. Perhaps we should be looking farther ahead. Most 35-year-old people have a fairly low risk of cardiac events within the next 10 years, but we know that atherosclerosis is chronic and progressive, and that elevated levels of cholesterol in the young predict symptomatic coronary disease in later years. Perhaps we should think about intervening early and estimate their 20-year risk. This may be a topic for future ATP committees to consider.

As the ATP III guidelines are put into operation, it remains unknown whether they will result in a healthier public. We are all hopeful that such guidelines—not mandates—will enhance awareness and generally promote prevention in medical care.

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■ REFERENCES

1. Expert Panel on Detection, Evaluation, and Treatment of High Blood Cholesterol in Adults. 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). *JAMA* 2001; 285:2486–2497.
2. National Cholesterol Education Program. Second report of the Expert Panel on Detection, Evaluation, and Treatment of High Blood Cholesterol in Adults (Adult Treatment Panel II). *Circulation* 1994; 89:1333–1445.
3. Sprecher DL. Where to draw the line using statins: Lessons from 4S to AFCAPS/TexCAPS [Commentary]. *Cleve Clin J Med* 2000; 67:169–171.

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See Patient Information, page 623