National Cholesterol Education Program (NCEP) Guidelines for Interpretation of Lipid Values

Adult Treatment Panel III (2001; updated 2004)

1. Initial classification of risk is based on a fasting lipoprotein profile (total cholesterol, LDL cholesterol, HDL cholesterol, triglycerides).

    *   If the testing opportunity is non-fasting, only the total and HDL cholesterol will be useable. In non-fasting situations, if total cholesterol is ≥200 mg/dL or HDL cholesterol is <40 mg/dL, a follow-up fasting lipoprotein profile is needed for appropriate management based on LDL cholesterol.
    *   To reduce physiologic variability, it is recommended to average two measurements 1-8 weeks apart. If the two LDL cholesterol values differ ≥30 mg/dL, then obtain a third measurement in 1-8 weeks and average all three results.

2. Classification of results from lipoprotein profile (mg/dL):

    *   **LDL cholesterol (primary target of therapy)**
        Optimal: <100
        Near optimal: 100-129
        Borderline high: 130-159
        High: 160-189
        Very high: ≥190
    *   **Total cholesterol**
        Desirable: <200
        Borderline high: 200-239
        High: ≥240
    *   **HDL cholesterol**
        Low: <40 (risk factor)
        High: ≥60 (desirable)
    *   **Triglycerides**
        Normal: <150
        Borderline high: 150-199
        High: 200-499
        Very high: ≥500

3. Identify patients at high risk based on clinical atherosclerotic disease. These conditions are considered CHD risk equivalent:

    *   Clinical coronary heart disease (CHD)
    *   Symptomatic carotid artery disease
    *   Peripheral arterial disease
    *   Abdominal aortic aneurysm

- Diabetes is also regarded as "CHD risk equivalent"

4. Identify other major risk factors:
    - Cigarette smoking
    - Hypertension (BP ≥140/90 mm Hg or on antihypertensive medication)
    - 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)
    - Low HDL cholesterol (<40 mg/dL). **Note:** HDL cholesterol ≥60 mg/dL counts as a "negative" risk factor; its presence removes one risk factor from the total count.

5. If the patient does not have CHD or a CHD risk equivalent condition, and two or more risk factors are present (not including LDL cholesterol), the 10 year (short term) CHD risk should be calculated from Framingham risk tables. The Framingham risk can be determined using information at the National Heart, Lung, and Blood Institute (NHLBI) web site in reference 1. The Framingham categories for 10 year risk for CHD are:
    - >20% = CHD risk equivalent
    - 10% to 20%
    - <10%

6. General guidelines for treatment are provided in the table below. Refer to the NHLBI web site (see reference 1) for the most recent detailed information on treatment recommendations and drug dosages.

Risk Category	LDL Goal	LDL Level to Initiate Therapeutic Lifestyle Changes	LDL Level to Consider Drug Therapy
High risk: CHD or CHD risk equivalent conditions (10 y risk >20%)	<100 mg/dL optional goal <70 mg/dL	≥100 mg/dL	≥100 mg/dL (<100 mg/dL consider drug options)
Moderately high risk: 2+ risk factors (10 y risk 10% to 20%)	<130 mg/dL optional goal <100 mg/dL	≥130 mg/dL	≥130 mg/dL (100-129 mg/dL consider drug options)

Risk Category	LDL Goal	LDL Level to Initiate Therapeutic Lifestyle Changes	LDL Level to Consider Drug Therapy
Moderate risk: 2+ risk factors (10 y risk <10%)	<130 mg/dL	≥130 mg/dL	≥160 mg/dL
Lower risk: 0-1 risk factor	<160 mg/dL	≥160 mg/dL	≥190 mg/dL (160-189 mg/dL drug optional)

7. High triglycerides should be managed to reach the LDL cholesterol goal. If triglycerides are ≥500 mg/dL after the LDL goal is met, add treatment to lower triglycerides to prevent pancreatitis. If triglycerides are ≥200 mg/dL after the LDL goal is met, add treatment to reach a non HDL goal (total cholesterol-HDL cholesterol) which is 30 mg/dL higher than the LDL cholesterol goals in the table above. Refer to the NHLBI web site for more details.

8. A metabolic syndrome, independent of the LDL level, is defined as any three of the conditions in the table below. Patients with metabolic syndrome are at increased risk of CHD. Therapeutic lifestyle changes should be initiated to address obesity and inactivity. If no improvement occurs after three months, treatment of the lipid and non-lipid risk factors should be initiated. Refer to the NHLBI web site for more details.

9.

Risk Factor	Defining Level
Abdominal obesity	Waist circumference
Men	>102 cm (>40 inches)
Women	>88 cm (>35 inches)
Triglycerides	≥150 mg/dL
HDL cholesterol	
Men	<40 mg/dL
Women	<50 mg/dL
Blood pressure	≥130/≥85 mm Hg
Fasting glucose	≥110 mg/dL

References

1. National Heart, Lung, and Blood Institute, National Institutes of Health (NHLBI/NIH) web site: http://www.nhlbi.nih.gov/guidelines/cholesterol/index.htm
2. Adult Treatment Panel III Executive Summary, *JAMA* 2001, 285:2468-97.
3. Adult Treatment Panel III, 2004 update, *Circulation* 2004, 110:227-39.