

REVIEW ARTICLE

John A. Jarcho, M.D., *Editor*

Lipid Management for the Prevention of Atherosclerotic Cardiovascular Disease

Erin D. Michos, M.D., M.H.S., John W. McEvoy, M.B., B.Ch., M.H.S.,
and Roger S. Blumenthal, M.D.

IN 1961, THE INVESTIGATORS INVOLVED IN THE FRAMINGHAM HEART STUDY identified serum cholesterol as one of the “factors of risk” for coronary heart disease.¹ Since then, numerous epidemiologic studies and randomized clinical trials have established that an elevated level of low-density lipoprotein (LDL) cholesterol is a major contributor to atherosclerotic cardiovascular disease.^{2,3} As a consequence, the management of serum cholesterol levels has become a central objective in the effort to prevent cardiovascular events. The currently used therapies with demonstrated efficacy (see Table S1 in the Supplementary Appendix, available with the full text of this article at NEJM.org) predominantly target the apolipoprotein B-associated lipoproteins reflected in levels of LDL cholesterol, non-high-density lipoprotein cholesterol (non-HDL cholesterol), and triglycerides (Fig. 1).

The most recent guidelines for cholesterol management put forward by the American College of Cardiology–American Heart Association (ACC–AHA) were published in 2018 (Fig. 2).⁴ In 2019, the ACC–AHA published guidelines for the primary prevention of cardiovascular disease, carrying forward recommendations for risk estimation and lipid management from the 2018 guidelines on cholesterol management.⁵ Informed by these new guidelines and other recent advances in treatment, this review is intended to summarize current methods of managing serum lipid levels for the prevention of atherosclerotic cardiovascular disease.

LIFESTYLE MANAGEMENT

The foundation for managing serum cholesterol is the facilitation of a healthy lifestyle (which includes diet) across a person’s life span.^{5,6} Even persons whose genetic profile puts them at increased risk for coronary heart disease can reduce their risk by up to 50% through changes in lifestyle.⁷ Maintenance of a normal weight and blood sugar level, reduction in the intake of simple sugars and refined carbohydrates, and increases in physical activity all improve lipid levels and provide other healthful benefits^{4,8,9} and should be undertaken regardless of whether pharmacotherapy is also recommended. Dietary and other changes in lifestyle recommended for the management of lipid levels are discussed further in the Supplementary Appendix.

LDL CHOLESTEROL LEVEL AND RISK

The direct relationship between LDL cholesterol level and the risk of atherosclerotic cardiovascular disease¹⁰ has led to the simple recommendation that “lower is better.” However, measurement of LDL cholesterol levels alone is not sufficient to assess cardiovascular risk. Approximately 40% of persons with coronary heart disease have a total cholesterol level of less than 200 mg per deciliter (5.2 mmol

From the Ciccarone Center for the Prevention of Cardiovascular Disease, Johns Hopkins University School of Medicine, Baltimore (E.D.M., R.S.B.), and the National Institute for Prevention and Cardiovascular Health, National University of Ireland, Galway (J.W.M.). Address reprint requests to Dr. Michos at the Division of Cardiology, Johns Hopkins School of Medicine, Blalock 524-B, 600 N. Wolfe St., Baltimore, MD 21287, or at edonnell@jhmi.edu.

N Engl J Med 2019;381:1557-67.

DOI: 10.1056/NEJMa1806939

Copyright © 2019 Massachusetts Medical Society.