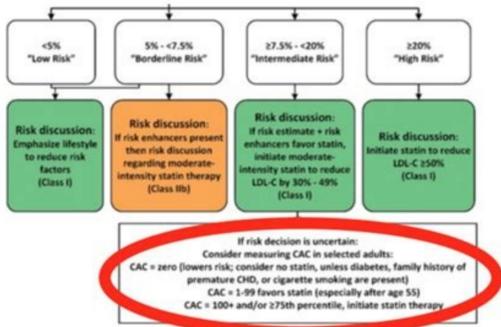


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REVIEW ARTICLE

New 2018 ACC/AHA Guidelines on Cholesterol Management: Key Changes and Implications

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During the American Heart Association (AHA)'s scientific sessions held in November 2018, the new 10-year ASCVD risk estimation in young patients; upgrading of non-statin therapies for LDL-cholesterol lowering treatment; use of LDL-c thresholds (and not only of percentual reduction) to consider intensification of therapy; time of blood collection to measure lipid levels; inclusion of the coronary artery calcium (CAC) score in the decision-making process in the management of intermediate-risk patients.

- 1) a new 10-y risk ASCVD categorization for adults 40 to 75 years of age and a lifetime risk estimation in young patients;
- 2) upgrading of non-statin therapies for LDL-cholesterol lowering treatment;
- 3) use of LDL-c thresholds (and not only of percentual reduction) to consider intensification of therapy;
- 4) time of blood collection to measure lipid levels;
- 5) inclusion of the coronary artery calcium (CAC) score in the decision-making process in the management of intermediate-risk patients.

A healthy lifestyle including an anti-atherogenic diet, physical activity, weight control and not smoking remains the cornerstone for cardiovascular prevention. Regardless of pharmacological treatment used, these habits are important at all ages, and are some of the key recommendations for ASCVD prevention.

About the treatment with lipid-lowering drugs, statins remain as the first-choice agents. However, ezetimibe and proprotein convertase subtilisin/kexin type 9 (PCSK9) inhibitors have gained attention as add-on drugs in a

more aggressive approach for low-density lipoprotein cholesterol (LDL-c) reduction. Ezetimibe, a cholesterol absorption inhibitor, is the most commonly used drug in combination with statins, contributing for an additional 15-30% reduction in LDL-c levels.

Considerable changes have been made in lipid-lowering therapy with the use of monoclonal antibodies that inhibit PCSK9, such as evolocumab and alirocumab. Based on studies showing an 1.5% absolute risk reduction in composite ASCVD outcomes in a follow-up of 2.2-2.8 years, these new drugs are now recommended and should be included to therapy if lipid targets are not met after maximally tolerated doses of statin and ezetimibe. Recommendations are detailed below:

Established ASCVD: high-intensity statin should be indicated aiming at a $\geq 50\%$ LDL-c reduction (and LDL-c < 70 mg/dl in those at very high ASCVD risk - Table 1). If this target is not achieved, ezetimibe should be added followed by PCSK9 inhibitors. The rationale is based on the findings that support the safety of extremely low LDL levels, and that, for LDL-c levels, "lower is better".²

Primary prevention (Figure 1)
10-year ASCVD risk calculation: the 10-y risk of ASCVD (calculated by the pooled cohort equation - PCE) is now categorized as:
 a. low ($< 5\%$) - lifestyle changes are indicated;
 b. borderline ($5\% - < 7.5\%$) - the initiation of moderate-intensity statin therapy is recommended in selected cases;
 c. intermediate ($7.5\% - < 20\%$) - this is one of the main updates of the guideline. In the presence of risk-enhancing factors, it is suggested to start a moderate-intensity statin in this new group (Table 2). In addition, if the need for statin therapy by the patient remains uncertain (a common situation), the CAC score may

Keywords

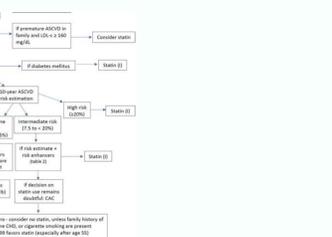
Cardiovascular Diseases/ prevention and control; Lifestyle Physical, Activity; Weight Loss; Diet, Atherogenic; Cholesterol, Dietary.

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DOI: <https://doi.org/10.36660/ijcs.20190088>

Manuscript received on April 26, 2019; revised on July 11, 2019; accepted on August 27, 2019



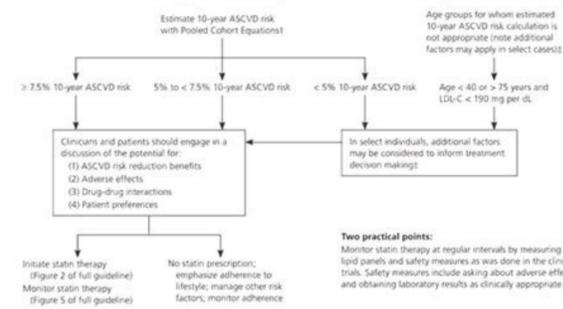
A. Heart-healthy lifestyle habits are considered the foundation of preventive treatment for ASCVD risk (see lifestyle report)¹

B. High-risk statin benefit groups that require optimal statin intensity

- (1) Established ASCVD
- (2) Primary elevations of LDL-C ≥ 190 mg per dL (4.92 mmol per L)
- (3) Diabetes mellitus, 40 to 75 years of age, LDL-C level 70 to 189 mg per dL (1.81 to 4.90 mmol per L)

C. Primary prevention in those not in the latter two groups

Risk calculator allows for discussion of appropriate risk factor management and consideration of statin therapy for those in a benefit group



¹—2019 AHA/ACC Guideline on Lifestyle Management to Reduce Cardiovascular Risk.
²—The Pooled Cohort Equations can be used to estimate 10-year ASCVD risk in individuals with and without diabetes. A downloadable spreadsheet enabling estimation of 10-year and lifetime risk for ASCVD and a web-based calculator are available at <http://my.americanheart.org/riskcalculator> and <http://www.cardiosource.org/science-and-quality/practice-guidelines-and-quality-standards/2013-prevention-guideline-tool.aspx>.
³—Additional factors that may be considered to inform decision making if a risk decision is uncertain include LDL-C ≥ 160 mg per dL (4.14 mmol per L), family history of premature ASCVD, lifetime risk of ASCVD, high-sensitivity C-reactive protein level ≥ 2.0 mg per L (19.05 mmol per L), coronary artery calcium score ≥ 300 Agatston units, and ankle-brachial index < 0.9 .

Table 1 Classes of recommendations

	Definition	Wording to use
Classes of recommendations	Class I Evidence and/or general agreement that a given treatment or procedure is beneficial, useful, effective.	Is recommended or is indicated
	Class II Conflicting evidence and/or a divergence of opinion about the usefulness/efficacy of the given treatment or procedure.	
	Class IIa Weight of evidence/opinion is in favour of usefulness/efficacy.	Should be considered
	Class IIb Usefulness/efficacy is less well established by evidence/opinion.	May be considered
	Class III Evidence or general agreement that the given treatment or procedure is not useful/effective, and in some cases may be harmful.	Is not recommended

Effects of lipoproteins a ϵ a ϵ a ϵ serum and smoking on atherosclerosis in young men and women. Bitton A, Choudhry NK, Matlin Os, et al. Cannon Cp, Cariou B, Blom D, et al. Pressler, Phd, Rn, Faha*; Barbara Riegel, Phd, Rn, Faha*; Duminda N. is here that a discussion on living costs can occur. HV Ganga, Slim Hb, Thompson Pd. A simple approach led by the disease to customize the assignment of the statins recommended by Acc/Aha in the elderly: the Biomage study. J AM COLLA CARDIOL. Levine, MD, Fact, Faha, chair, Patrick T. If these patients remain unrelated, repeat the CAC measurement in 5-10 years can have a certain value in the reevaluation for the progression of the CAC, but the data is limited. Systematic revision and meta-analysis suggests that the knowledge that the CAC score of a patient is greater than zero is beneficial. 5. 10377 world's a, ~ a ϵ ϵ 45.Crossrefgoogle Scholars4.4.1.4-11. Lichtenstein Ah, Appel LJ, Brands M, et al. . C6 is supported by the meta-analysis that compare the non-stained therapeutic agents of high intensity against intensity-low-intensity (ie, ie, ie, ie, ie, ie, IE, Ezetimibe, bile sequestrers, PCSK9 antagonists) who supervise LDL.S4.3-27 receptors therefore, a risk discussion can be kept on the benefits of achieving a δ δ δ 50% LDL-C Lowering of adults with diabetes mellitus that have a δ δ δ Ascvd risk of 20%. C6 confirms the general principle according to which "work is better" for LDL-C.S2.1.2-4 "S2.1-6 The current guideline considers the tests from new RCT to help in translation of RCT data to individual data Patients to provide Netti.S2.1.2-72.1.3. LDL-C and other risk factors, even if LDL-C is a primary cause of atherosclerosis, other risk factors also contribute. Knowler to WC, Barrett-Connor e, Fowler if, et al. . 2015; 313: 1973a δ a δ δ 4.CrossrefmedLineoogle Scholar3.2. Drugss3.2-1. 1994; 344: 1383a δ δ δ 4.CrossrefmedLineoogle Scholars4.1-7. High-dose atorvastatin against simvastatin of habitual dose for secondary prevention after myocardial infarction: the ideal study: a randomized controlled study. Jama. 2008; 59:

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