2019 ACC/AHA Guideline on the Primary Prevention of Cardiovascular Disease

Mar 17, 2019 | Melvyn Rubenfire, MD, FACC

Authors: Arnett DK, Blumenthal RS, Albert MA, et al.

Citation: 2019 ACC/AHA Guideline on the Primary Prevention of Cardiovascular Disease: A Report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines. *J Am Coll Cardiol* 2019;March 17:[Epub ahead of print].

The following are key perspectives from the 2019 American College of Cardiology/American Heart Association (ACC/AHA) Guideline on the Primary Prevention of Cardiovascular Disease (CVD):

Scope of Guideline

1. The guideline is a compilation of the most important studies and guidelines for atherosclerotic CVD (ASCVD) outcomes related to nine topic areas. The focus is primary prevention in adults to reduce the risk of ASCVD (acute coronary syndromes, myocardial infarction, stable or unstable angina, arterial revascularization, stroke/transient ischemic attack, peripheral arterial disease), as well as heart failure and atrial fibrillation. The guideline emphasizes patient-physician shared decisions with a multidisciplinary team-based approach to the implementation of recommended preventive strategies with sensitivities to the social determinants of health that may include specific barriers to care, limited health literacy, financial distress, cultural influences, education level, and other socioeconomic risk factors related to short- and long-term health goals.

Assessment of ASCVD Risk

2. Assessment of ASCVD risk is the foundation of primary prevention. For those aged 20-39 years, it is reasonable to measure traditional risk factors every 4-6 years to identify major factors (e.g., tobacco, dyslipidemia, family history of premature ASCVD, chronic inflammatory diseases, hypertension, or type 2 diabetes mellitus [T2DM]) that provide rationale for optimizing lifestyle and tracking risk factor progression and need for treatment. For adults aged 20-39 years and those aged 40-59 years who are not already at elevated (≥7.5%) 10-year risk, estimating a lifetime or 30-year risk for ASCVD may be considered (ASCVD Risk Estimator Plus). For those aged 20-59 years not at high short-term risk, the 30-year and lifetime risk would be reasons for a communication strategy for reinforcing adherence to lifestyle recommendations and for some drug therapy (e.g., familial hypercholesterolemia, hypertension, prediabetes, family history of premature ASCVD with dyslipidemia or elevated lipoprotein [a] Lp[a]).

Estimating Risk of ASCVD

3. Electronic and paper chart risk estimators are available that utilize population-based and clinical trial outcomes with the goal of matching need and intensity of preventive therapies to absolute risk (generally 10 years) for ASCVD events. The guideline suggests the race- and sex-specific Pooled Cohort Equation (PCE) (ASCVD Risk Estimator Plus) to estimate 10-year ASCVD risk for asymptomatic adults aged 40-79 years. Adults should be categorized into low (<5%), borderline (5 to <7.5%), intermediate (≥7.5 to <20%), or high (≥20%) 10-year risk. The PCEs are best validated among non-Hispanic whites and non-Hispanic blacks living in the United States. In other race/ethnic groups and some non-US populations, the PCE may over- or under-estimate risk (e.g., HIV infection, chronic inflammatory or autoimmune disease, and low socioeconomic levels). Consideration should be given to use of other risk prediction tools if validated in a population with similar characteristics. Examples include the general Framingham CVD risk score, Reynolds risk score, SCORE, and QRISK/JBS3 tools. Among borderline and intermediate-risk adults, one may consider additional individual "risk-enhancing" clinical factors that can be used to revise the 10-year ASCVD risk estimate. For initiating or intensifying statin therapy, include: family history of premature ASCVD (men <55 years, women <65 years); low-density lipoprotein cholesterol (LDL-C) ≥160 mg/dl or non-high-density lipoprotein cholesterol (non-HDL-C) ≥190 mg/dl; chronic kidney disease (estimated glomerular filtration rate [eGFR] <60 ml/min/1.73 m^2); metabolic syndrome; pre-eclampsia and premature menopause (<40 years); inflammatory diseases including rheumatoid arthritis, lupus, psoriasis, HIV; South Asian ancestry; biomarkers including fasting triglycerides ≥175 mg/dl, Lp(a) ≥50 mg/dl, high-sensitivity C-reactive protein ≥2 mg/L, apolipoprotein B >130 mg/dl, and ankle-brachial index (ABI) <0.9. After considering these clinically available risk-enhancing factors, if there is still uncertainty about the reliability of the risk estimate for individuals in the borderline or intermediate-risk categories, further testing to document subclinical coronary atherosclerosis with computed tomography-derived coronary artery calcium score (CACs) is reasonable to more accurately reclassify the risk estimate upward or downward.

   For persons at intermediate predicted risk (≥7.5 to <20%) by the PCE or borderline (5 to <7.5%) predicted risk, CACs helps refine risk assessment. CACs can re-classify risk upward (particularly when score is ≥100 or ≥75th age/sex/race percentile) or downward (if CACs = 0), which is not uncommon, particularly in men <50 and women <60 years. In MESA (Multi-Ethnic Study of Atherosclerosis), the CACs was strongly associated with 10-year ASCVD risk in a graded fashion across age, sex, and race/ethnic groups, and independent of traditional risk factors. CAC may refine ASCVD risk estimates among lower-risk women (<7.5% 10-year risk), younger adults (<45 years), and older adults (≥75 years), but more data are needed to support its use in these subgroups. A CACs = 0 identifies individuals at lower risk of ASCVD events and mortality over a ≥10-year period, who appear to derive little or no benefit from statins and for which drug interventions can be delayed. The absence of CAC does not rule out noncalcified plaque, and clinical judgment about risk should prevail. CAC might also be considered in refining risk for selected low-risk adults (<5% 10-year risk) such as those with a strong family history of premature coronary heart disease (CHD). There are Internet-available risk estimation tools (MESA and ASTROCHARM), which incorporate both risk factors and CAC for estimating 10-year CHD or ASCVD risk, respectively. CAC measurement is not intended as a "screening" test for all, but rather is a decision aid in select adults to facilitate the clinician-patient risk discussion.

Nutrition

4. Dietary patterns associated with CVD mortality include—sugar, low-calorie sweeteners, high-carbohydrate diets, low-carbohydrate diets, refined grains, trans fat, saturated fat, sodium, red meat, and processed red meat (such as bacon, salami, ham, hot dogs, and sausage). All adults should consume a healthy plant-based or Mediterranean-like diet high in vegetables, fruits, nuts, whole grains, lean vegetable or animal protein (preferably fish), and vegetable fiber, which has been shown to lower the risk of all-cause mortality compared to control or standard diet. Longstanding dietary patterns that focus on low intake of carbohydrates and a high intake of animal fat and protein as well as high carbohydrate diets are associated with increased cardiac and noncardiac mortality. The increased availability of affordable, palatable, and high-calorie foods along with decreased physical demands of many jobs have fueled the epidemic of obesity and the consequent increases in hypertension and T2DM.

Obesity

5. Adults diagnosed as obese (body mass index [BMI] ≥30 kg/m^2) or overweight (BMI 25-29.9 kg/m^2) are at increased risk of ASCVD, heart failure, and atrial fibrillation compared with those of a normal weight. Obese and overweight adults are advised to participate in comprehensive lifestyle programs for 6 months that assist participants in adhering to a low-calorie diet (decrease by 500 kcal or 800-1500 kcal/day) and high levels of physical activity (200-300 minutes/week). Clinically meaningful weight loss (≥5% initial weight) is associated with improvement in blood pressure (BP), LDL-C, triglycerides, and glucose levels among obese or overweight individuals, and delays the development of T2DM. In addition to diet and exercise, FDA-approved pharmacologic therapies and bariatric surgery may have a role for weight loss in select patients.

Physical Activity

6. Despite the public health emphasis for regular exercise based on extensive observational data that aerobic physical activity lowers ASCVD, approximately 50% of adults in the United States do not meet minimum recommendations. There is a strong inverse dose-response relationship between the amount of moderate-to-vigorous physical activity and incident ASCVD events and mortality. Adults should engage in at least 150 minutes/week of moderate-intensity or 75 minutes/week of vigorous-intensity physical activity including resistance exercise.

Diabetes

7. T2DM, defined as a hemoglobin A1c (HbA1c) >6.5%, is a metabolic disorder characterized by insulin resistance leading to hyperglycemia. The development and progression are heavily influenced by dietary pattern, physical activity, and body weight. All with T2DM should undergo dietary counseling for a heart-healthy diet that in T2DM lowers CVD events and CVD mortality. Among options include the Mediterranean, DASH, and vegetarian/vegan diets that achieve weight loss and improve glycemic control. At least 150 minutes/week of moderate to vigorous physical activity (aerobic and resistance) in T2DM lowers HbA1c about 0.7% with an additional similar decrease by weight loss. *Other risk factors should be identified and treated aggressively.* For younger individuals, or those with a mildly elevated HbA1c at the time of diagnosis of T2DM, clinicians can consider a trial of lifestyle therapies for 3-6 months before drug therapy.

   First-line therapy to improve glycemic control and reduce CVD risk is metformin. Compared to lifestyle modifications, metformin resulted in a 32% reduction in micro- and macrovascular diabetes-related outcomes, a 39% reduction in myocardial infarction, and a 36% reduction in all-cause mortality. The goal is a HbA1c 6.5-7%. Several classes of medications have been shown to effectively lower blood glucose but may not affect ASCVD risk including the often-used sulfonylureas. Two classes of glucose-lowering medications have recently demonstrated a reduction in ASCVD events in adults with T2DM and ASCVD. Sodium-glucose cotransporter 2 (SGLT-2) inhibitors act in the proximal tubule to increase urinary excretion of glucose and sodium, leading to a reduction in HbA1c, weight, and BP and in randomized clinical trials, significant reduction in ASCVD events and heart failure. The majority of patients studied had established CVD at baseline, although limited data suggest this class of medications may be beneficial for primary prevention. The glucagon-like peptide-1 receptor (GLP-1R) agonists increase insulin and glucagon production in the liver, increase glucose uptake in muscle and adipose tissue, and decrease hepatic glucose production. GLP-1R agonists have been found to significantly reduce the risk of ASCVD events in adults with T2DM at high ASCVD risk. In patients with T2DM and additional risk factors for CVD, it may be reasonable to initiate these two classes of medications for primary prevention of CVD.

Lipids

8. Primary ASCVD prevention requires assessing risk factors beginning in childhood. For those <19 years of age with familial hypercholesterolemia, a statin is indicated. For young adults (ages 20-39 years), priority should be given to estimating lifetime risk and promoting a healthy lifestyle. Statin should be considered in those with a family history of premature ASCVD and LDL-C ≥160 mg/dl. ASCVD risk-enhancing factors, (see risk estimate section), should be considered in all patients.

Statin Treatment Recommendations

9. The following are guideline recommendations for statin treatment:
   - Patients ages 20-75 years and LDL-C ≥190 mg/dl, use high-intensity statin without risk assessment.
   - T2DM and age 40-75 years, use moderate-intensity statin and risk estimate to consider high-intensity statins. Risk-enhancers in diabetics include ≥10 years for T2DM and 20 years for type 1 DM, ≥30 mcg albumin/mg creatinine, eGFR <60 ml/min/1.73 m^2, retinopathy, neuropathy, ABI <0.9. In those with multiple ASCVD risk factors, consider high-intensity statin with aim of lowering LDL-C by 50% or more.
   - Age >75 years, clinical assessment and risk discussion.
   - Age 40-75 years and LDL-C ≥70 mg/dl and <190 mg/dl without diabetes, use the risk estimator that best fits the patient and risk-enhancing factors to decide intensity of statin.
     - Risk 5% to <7.5% (borderline risk). Risk discussion: if risk-enhancing factors are present, discuss moderate-intensity statin and consider coronary CACs in select cases.
     - Risk ≥7.5-20% (intermediate risk). Risk discussion: use moderate-intensity statins and increase to high-intensity with risk enhancers. Option of CACs to risk stratify if there is uncertainty about risk. If CAC = 0, can avoid statins and repeat CAC in the future (5-10 years), the exceptions being high-risk conditions such as diabetes, family history of premature CHD, and smoking. If CACs 1-100, it is reasonable to initiate moderate-intensity statin for persons ≥55 years. If CAC >100 or 75th percentile or higher, use statin at any age.
     - Risk ≥20% (high risk). Risk discussion to initiate high-intensity statin to reduce LDL-C by ≥50%.

   Both moderate- and high-intensity statin therapy reduce ASCVD risk, but a greater reduction in LDL-C is associated with a greater reduction in ASCVD outcomes. The dose response and tolerance should be assessed in about 6-8 weeks. If LDL-C reduction is adequate (≥30% reduction with intermediate- and 50% with high-intensity statins), regular interval monitoring of risk factors and compliance with statin therapy are necessary to determine adherence and adequacy of effect (about 1 year). For patients aged >75 years, assessment of risk status and a clinician-patient risk discussion are needed to decide whether to continue or initiate statin treatment. The CACs may help refine ASCVD risk estimates among lower-risk women (<7.5%) and younger adults (<45 years), particularly in the setting of risk enhancers.

Hypertension

10. In the United States, hypertension accounts for more ASCVD deaths than any other modifiable risk factor. The prevalence of stage I hypertension defined as systolic BP (SBP) ≥130 or diastolic BP (DBP) ≥80 mm Hg among US adults is 46%, higher in blacks, Asians, and Hispanic Americans, and increases dramatically with increasing age. A meta-analysis of 61 prospective studies observed a log-linear association between SBP levels <115 to >180 mm Hg and DBP levels <75 to 105 mm Hg and risk of ASCVD. In that analysis, *20 mm Hg higher SBP and 10 mm Hg higher DBP were each associated with a doubling in the risk of death from stroke, heart disease, or other vascular disease.* An increased risk of ASCVD is associated with higher SBP and SBP has been reported across a broad age spectrum, from 30 to >80 years of age.

    In adults with elevated or borderline hypertension (BP 120-129/<80 mm Hg) or hypertension, the initial recommendations include weight loss, heart-healthy diet (DASH or DASH Mediterranean), sodium restriction of 1000 mg reduction and optimal <1500 mg/d), diet rich in potassium with supplements as necessary, exercise as described including aerobic, isometric resistance (hand-grip), dynamic resistance (weights), and limited alcohol (men <3 and women <2 per day). In adults with stage I hypertension (BP 130-139/80-89 mm Hg) and estimated 10-year ASCVD risk of <10%, nonpharmacologic therapy is recommended. In those with a 10% or higher 10-year ASCVD risk, use of BP-lowering medication is recommended with a BP target of <130/80 mm Hg including persons with chronic kidney disease and diabetes. A target of <130/80 mm Hg is also recommended for Stage 2 hypertension, defined as BP ≥140/90 mm Hg with nonpharmacological and BP-lowering medication.

Tobacco

11. Tobacco use is the leading preventable cause of disease, disability, and death in the United States. Smoking and smokeless tobacco (e.g., chewing tobacco) increases the risk for all-cause mortality and causal for ASCVD. Secondhand smoke is a cause of ASCVD and stroke, and almost one third of CHD deaths are attributable to smoking and exposure to secondhand smoke. Even low levels of smoking increase risks of acute myocardial infarction; thus, reducing the number of cigarettes per day does not totally eliminate risk. Electronic Nicotine Delivery Systems (ENDS), known as e-cigarettes and vaping, are a new class of tobacco products that emit aerosol containing fine and ultrafine particulates, nicotine, and toxic gases that may increase risk for CV and pulmonary diseases. Arrhythmias and hypertension with e-cigarette use have been reported. Chronic use is associated with persistent increases in oxidative stress and sympathetic stimulation in the healthy young.

    All adults should be assessed at every visit for tobacco use, and those who use tobacco should be assisted and strongly advised to quit on every visit. Referral to specialists is helpful for both behavioral modification, nicotine replacement, and drug treatments. Amongst the treatments include varieties of nicotine replacement, the nicotine receptor blocker varenicline, and bupropion, an antidepressant.

Aspirin

12. For decades, low-dose aspirin (75-100 mg with US 81 mg/day) has been widely administered for ASCVD prevention. By irreversibly inhibiting platelet function, aspirin reduces risk of atherothrombosis but at the risk of bleeding, particularly in the gastrointestinal (GI) tract. Aspirin is well established for secondary prevention of ASCVD and is widely recommended for this indication, but recent studies have shown that in the modern era, aspirin should not be used in the routine primary prevention of ASCVD due to lack of net benefit. Most important is to avoid aspirin in persons with increased risk of bleeding including a history of GI bleeding or peptic ulcer disease, bleeding from other sites, age >70 years, thrombocytopenia, coagulopathy, chronic kidney disease, and concurrent use of nonsteroidal anti-inflammatory drugs, steroids, and anticoagulants. The following are recommendations based on meta-analysis and three recent trials:
    - Low-dose aspirin might be considered for primary prevention of ASCVD in select higher ASCVD adults aged 40-70 years who are not at increased bleeding risk.
    - Low-dose aspirin should not be administered on a routine basis for primary prevention of ASCVD among adults >70 years.
    - Low-dose aspirin should not be administered for primary prevention among adults at any age who are at increased bleeding risk.

Clinical Topics: Arrhythmias and Clinical EP, Cardiovascular Care Team, Diabetes and Cardiometabolic Disease, Dyslipidemia, Heart Failure and Cardiomyopathies, Prevention, Atrial Fibrillation/Supraventricular Arrhythmias, Homozygous Familial Hypercholesterolemia, Hypertriglyceridemia, Lipid Metabolism, Nonstatins, Novel Agents, Statins, Acute Heart Failure, Diet, Exercise, Hypertension, Smoking

Keywords: *ACC Annual Scientific Session, ACC19, Aspirin, Atherosclerosis, Atrial Fibrillation, Bariatric Surgery, Blood Pressure, Cholesterol, LDL, Coronary Disease, Diabetes Mellitus, Type 2, Diet, Dyslipidemias, Exercise, Heart Failure, HIV, Hydroxymethylglutaryl-CoA Reductase Inhibitors, Hypercholesterolemia, Hyperglycemia, Hypertension, Inflammation, Kidney Failure, Chronic, Lipids, Lipoproteins, Metabolic Syndrome, Metformin, Myocardial Infarction, Obesity, Plaque, Atherosclerotic, Pre-Eclampsia, Primary Prevention, Risk Factors, Smoking, Stroke, Tobacco, Triglycerides, Weight Loss*

Related Content

ACC/AHA Primary Prevention Guideline Provides Playbook For Managing CV Risk Factors

Prevention Clinical Topic Collection

Dyslipidemia Clinical Topic Collection

Similar Articles from ACC.org

Feb 12, 2025 | Journal Scan
New Machine Learning Algorithm Identifies Patients Likely to Benefit From LAAO vs. DOAC

Feb 12, 2025 | Journal Scan
ARRC-AF: Outcomes Following Index Ablation For Atrial Fibrillation

Feb 12, 2025 | Journal Scan
Sodium Reduction and Salt Substitutes Shown to Decrease BP, Recurrent Stroke

Feb 12, 2025 | Journal Scan
Is TMVR Following ELASTA-Clip Safe and Effective?

Feb 12, 2025 | Journal Scan
CV Hospitalizations and Income-Based Disparities Higher in US vs. Denmark