Primary Prevention of Cardiovascular Disease

2019 ACC/AHA Guideline

What is a medical guildline?

- A document with the aim of guiding decisions regarding diagnosis, management, and treatment in specific areas of healthcare.
- They identify, summarize and evaluate the highest quality evidence and most current data about prevention, diagnosis, prognosis, therapy including dosage of medications, risk/benefit and cost-effectiveness.

Why are clinical practice guidelines important?

- They are based on an examination of current evidence within the paradigm of **evidence-based** medicine.
- They usually include summarized **consensus statements** on best practice in healthcare.
- They define the most **important questions** related to clinical practice.
- They improve the **quality of care** for patients
- They improve the clinical **effectiveness**

A healthcare provider is obliged to know the medical guidelines of his/her profession, and has to decide whether to follow the recommendations of a guideline for an individual treatment.

Prevention of cardiovascular disease (CVDs)

1. People with risk factors who have not yet developed clinically manifest cardiovascular disease

(primary prevention).

Dyslipidemia, diabetes mellitus (DM), obesity, inactive lifestyle, hypertension, smoking, and family history are

risk factors *for* ***ASCVD.***

2. People with established CHD, CeVD or peripheral vascular disease

(secondary prevention).

2019 ACC/AHA Guideline on Primary Prevention of Cardiovascular Disease

AIM OF PUBLISHING:

- Although there has been substantial improvement in (ASCVD) outcomes in recent decades, *ASCVD remains the leading cause* of morbidity and mortality globally .
- In the US, it is also the leading cause of death for people of most racial/ethnic groups, with an estimated *cost of >$200 billion annually* in healthcare services, medications, and lost productivity.
- Much of this is attributable to *suboptimal implementation of prevention strategies* and uncontrolled ASCVD risk factors in many adults .
- Most Americans who have had a (MI) had *at least 1 cardiovascular risk factor* before their ASCVD event .
- An increasing number of ideal cardiovascular health factors have been associated with a lower prevalence and incidence of ASCVD events, HF, AF, cancer, depression, and cognitive impairment .

Therefore, moving individuals toward ideal cardiovascular health is critically important for prevention of many important health conditions.

Overview:

- ***2. Overarching Recommendations for ASCVD Prevention Efforts***
- 2.1. Patient-Centered Approaches to Comprehensive ASCVD Prevention
- 2.2. Assessment of Cardiovascular Risk
- ***3. Lifestyle Factors Affecting Cardiovascular Risk .***
- 3.1. Nutrition and Diet
- 3.2. Exercise and Physical Activity
- ***4. Other Factors Affecting Cardiovascular Risk***
- 4.1. Adults with Overweight and Obesity
- 4.2. Adults with Type 2 Diabetes Mellitus
- 4.3. Adults with High Blood Cholesterol
- 4.4. Adults with High Blood Pressure or Hypertension
- 4.5. Treatment of Tobacco Use
- 4.6. Aspirin Use...

The most important way to prevent ASCVD is to promote a healthy lifestyle throughout life.

- Prevention strategies must include a strong focus on lifestyle optimization (improvements in diet, physical activity, and avoidance of tobacco use and exposure to secondhand smoke) to minimize the risk of future ASCVD events.

- Even if a (BP)–reducing medication, lipid-lowering medication, or diabetes medication is ultimately prescribed, **lifestyle goals should be emphasized** on a regular basis.

- In summary, clinicians and individuals should focus attention on living a healthy lifestyle by referring to these evidence-based recommendations to help prevent ASCVD.

RCTs and systematic reviews with meta-analyses demonstrated greater reduction of ASCVD risk with ***team-based care*** than with usual care in patients with HTN, DM, and hyperlipidemia

- *Shared decision-making* occurs when practitioners engage patients in discussions about personalized ASCVD risk estimates and preventive strategies, including lifestyle habits, goals, and medical therapies.

- The clinician should tailor advice to a patient's socioeconomic and *educational status*, as well as *cultural*, and environments.

3. Lifestyle Factors Affecting Cardiovascular Risk

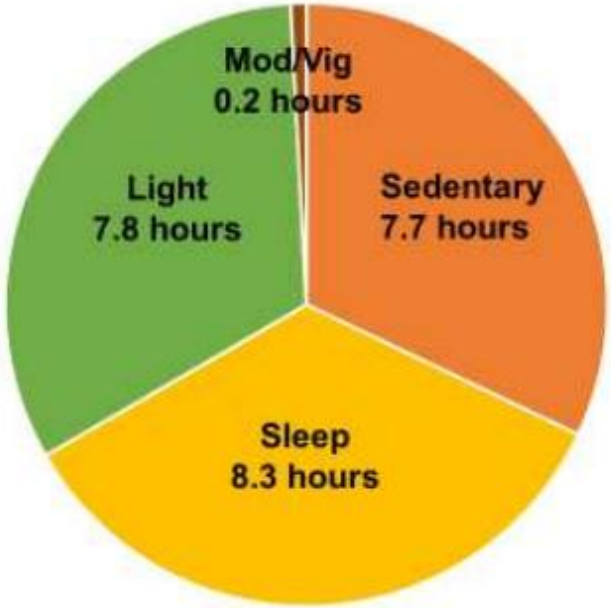
3.1. Nutrition and Diet

Recommendations for Nutrition and Diet Referenced studies that support recommendations are summarized in Online Data Supplements 4 and 5.		
COR	**LOE**	**Recommendations**
I	B-R	1. A diet emphasizing intake of vegetables, fruits, legumes, nuts, whole grains, and fish is recommended to decrease ASCVD risk factors (S3.1-1–S3.1-11).
IIa	B-NR	2. Replacement of saturated fat with dietary monounsaturated and polyunsaturated fats can be beneficial to reduce ASCVD risk (S3.1-12, S3.1-13).
IIa	B-NR	3. A diet containing reduced amounts of cholesterol and sodium can be beneficial to decrease ASCVD risk (S3.1-9, S3.1-14–S3.1-16).
IIa	B-NR	4. As a part of a healthy diet, it is reasonable to minimize the intake of processed meats, refined carbohydrates, and sweetened beverages to reduce ASCVD risk (S3.1-17–S3.1-24).
III: Harm	B-NR	5. As a part of a healthy diet, the intake of *trans* fats should be avoided to reduce ASCVD risk (S3.1-12, S3.1-17, S3.1-25–S3.1-27).

3.2. Exercise and Physical Activity

Recommendations for Exercise and Physical Activity Referenced studies that support recommendations are summarized in Online Data Supplements 6 and 7.		
COR	**LOE**	**Recommendations**
I	B-R	1. Adults should be routinely counseled in healthcare visits to optimize a physically active lifestyle (S3.2-1, S3.2-2).
I	B-NR	2. Adults should engage in at least 150 minutes per week of accumulated moderate-intensity or 75 minutes per week of vigorous-intensity aerobic physical activity (or an equivalent combination of moderate and vigorous activity) to reduce ASCVD risk (S3.2-3–S3.2-8).
IIa	B-NR	3. For adults unable to meet the minimum physical activity recommendations (at least 150 minutes per week of accumulated moderate-intensity or 75 minutes per week of vigorous-intensity aerobic physical activity), engaging in some moderate- or vigorous-intensity physical activity, even if less than this recommended amount, can be beneficial to reduce ASCVD risk (S3.2-5, S3.2-6).
IIb	C-LD	4. Decreasing sedentary behavior in adults may be reasonable to reduce ASCVD risk (S3.2-3, S3.2-9–S3.2-11).

Figure 1. Hours Per Day Spent in Various States of Activity



U.S. adults spend >7 h/d on average in sedentary activities. Replacing sedentary time with other physical activity involves increasing either moderate- to vigorous-intensity physical activity or light-intensity physical activity.
Data modified from Young et al. (S3.2-30).

Table 4. Definitions and Examples of Different Intensities of Physical Activity

Intensity	METs	Examples
Sedentary behavior*	1–1.5	Sitting, reclining, or lying; watching television
Light	1.6–2.9	Walking slowly, cooking, light housework
Moderate	3.0 –5.9	Brisk walking (2.4–4 mph), biking (5–9 mph), ballroom dancing, active yoga, recreational swimming
Vigorous	≥6	Jogging/running, biking (≥10 mph), singles tennis, swimming laps

**Sedentary behavior* is defined as any waking behavior characterized by an energy expenditure ≤1.5 METs while in a sitting, reclining, or lying posture. Standing is a sedentary activity in that it involves ≤1.5 METs, but it is not considered a component of sedentary behavior.
MET indicates metabolic equivalent; and mph, miles per hour.

4.1. Adults With Overweight and Obesity

Recommendations for Adults With Overweight and Obesity Referenced studies that support recommendations are summarized in Online Data Supplements 8 and 9.		
COR	**LOE**	**Recommendations**
I	B-R	1. In individuals with overweight and obesity, weight loss is recommended to improve the ASCVD risk factor profile (S4.1-1).
I	B-R	2. Counseling and comprehensive lifestyle interventions, including calorie restriction, are recommended for achieving and maintaining weight loss in adults with overweight and obesity (S4.1-1, S4.1-2).
I	C-EO	3. Calculating body mass index (BMI) is recommended annually or more frequently to identify adults with overweight and obesity for weight loss considerations.
IIa	B-NR	4. It is reasonable to measure waist circumference to identify those at higher cardiometabolic risk (S4.1-3–S4.1-6).

- Clinically meaningful weight loss (≥5% initial weight) is associated with moderate improvement in BP, LDL cholesterol , TG, and glc levels among individuals with overweight/obesity .

- Weight loss reduces or delays the development of T2DM in persons with obesity .

- Aerobic physical activity (e.g., brisk walking) for ≥150 minutes/week (equal to ≥30 minutes/day on most days of the week), is recommended for initial weight loss .

- Adults with obesity are also typically prescribed a diet designed to reduce caloric intake by ≥500 kcal/day from baseline, which often can be attained by limiting women to 1,200 to 1,500 kcal/day and men to 1,500 to 1,800 kcal/day . trained clinicians in a medical care setting with the patient under medical supervision .

- Comprehensive lifestyle intervention has been shown to produce on average 8 kg of weight loss (5%-10% of initial body weight).

Assessment of ASCVD risk

- Although all individuals should be encouraged to follow a heart-healthy lifestyle, estimating an individual's 10-year absolute ASCVD risk enables matching the intensity of preventive interventions to the patient's absolute risk, to maximize anticipated ***benefit*** and minimize ***potential harm*** from overtreatment.

- The 10-year ASCVD risk estimate is used to guide decision-making for many preventive interventions, including lipid management and BP management ;

Pooled Cohort Risk Assessment Equations

Predicts 10-year risk for a first atherosclerotic cardiovascular disease (ASCVD) event

ClinCalc.com » Cardiology » Pooled Cohort 10-Year ASCVD Risk Assessment Equations

Risk Factors for ASCVD

Gender: Male | Female

Age: ____ years

Race: White or other

Total Cholesterol: ____ mg/dL

HDL Cholesterol: ____ mg/dL

Systolic BP: ____ mmHg

Receiving treatment for high blood pressure (if SBP > 120 mmHg): No | Yes

Diabetes: No | Yes

Smoker: No | Yes

Reset | Calculate

low (<5%)

borderline (5% to 7.5%)

intermediate (≥7.5% to <20%)

high (≥20%)

2.2. Assessment of Cardiovascular Risk

Recommendations for Assessment of Cardiovascular Risk Referenced studies that support recommendations are summarized in Online Data Supplement 3.		
COR	**LOE**	**Recommendations**
I	B-NR	1. For adults 40 to 75 years of age, clinicians should routinely assess traditional cardiovascular risk factors and calculate 10-year risk of ASCVD by using the pooled cohort equations (PCE) (S2.2-1, S2.2-2).
IIa	B-NR	2. For adults 20 to 39 years of age, it is reasonable to assess traditional ASCVD risk factors at least every 4 to 6 years (S2.2-1–S2.2-3).
IIa	B-NR	3. In adults at borderline risk (5% to <7.5% 10-year ASCVD risk) or intermediate risk (≥7.5% to <20% 10-year ASCVD risk), it is reasonable to use additional risk-enhancing factors to guide decisions about preventive interventions (e.g., statin therapy) (S2.2-4–S2.2-14).
IIa	B-NR	4. In adults at intermediate risk (≥7.5% to <20% 10-year ASCVD risk) or selected adults at borderline risk (5% to <7.5% 10-year ASCVD risk), if risk-based decisions for preventive interventions (e.g., statin therapy) remain uncertain, it is reasonable to measure a coronary artery calcium score to guide clinician–patient risk discussion (S2.2-15–S2.2-31).
IIb	B-NR	5. For adults 20 to 39 years of age and for those 40 to 59 years of age who have <7.5% 10-year ASCVD risk, estimating lifetime or 30-year ASCVD risk may be considered (S2.2-1, S2.2-2, S2.2-32–S2.2-35).

Table 3. Risk-Enhancing Factors for Clinician–Patient Risk Discussion

Risk-Enhancing Factors

• **Family history of premature ASCVD** (males, age <55 y; females, age <65 y)
• **Primary hypercholesterolemia** (LDL-C, 160–189 mg/dL [4.1–4.8 mmol/L]; non–HDL-C 190–219 mg/dL [4.9–5.6 mmol/L])*
• **Metabolic syndrome** (increased waist circumference [by ethnically appropriate cutpoints], elevated triglycerides [>150 mg/dL, nonfasting], elevated blood pressure, elevated glucose, and low HDL-C [<40 mg/dL in men; <50 mg/dL in women] are factors; a tally of 3 makes the diagnosis)
• **Chronic kidney disease** (eGFR 15–59 mL/min/1.73 m^2 with or without albuminuria; not treated with dialysis or kidney transplantation)
• **Chronic inflammatory conditions,** such as psoriasis, RA, lupus, or HIV/AIDS
• **History of premature menopause (before age 40 y) and history of pregnancy-associated conditions that increase later ASCVD risk, such as preeclampsia**
• **High-risk race/ethnicity** (e.g., South Asian ancestry)
• **Lipids/biomarkers**: associated with increased ASCVD risk
  ○ Persistently elevated* primary hypertriglyceridemia (≥175 mg/dL, nonfasting)
  ○ If measured:
  ▪ **Elevated high-sensitivity C-reactive protein** (≥2.0 mg/L)
  ▪ **Elevated Lp(a):** A relative indication for its measurement is family history of premature ASCVD. An Lp(a) ≥50 mg/dL or ≥125 nmol/L constitutes a risk-enhancing factor, especially at higher levels of Lp(a).
  ▪ **Elevated apoB** (≥130 mg/dL): A relative indication for its measurement would be triglyceride ≥200 mg/dL. A level ≥130 mg/dL corresponds to an LDL-C >160 mg/dL and constitutes a risk-enhancing factor
  ▪ **ABI** (<0.9)

4.5. Treatment of Tobacco Use

Recommendations for Treatment of Tobacco Use Referenced studies that support recommendations are summarized in Online Data Supplements 15 and 16.		
COR	**LOE**	**Recommendations**
I	A	1. All adults should be assessed at every healthcare visit for tobacco use and their tobacco use status recorded as a vital sign to facilitate tobacco cessation (S4.5-1).
I	A	2. To achieve tobacco abstinence, all adults who use tobacco should be firmly advised to quit (S4.5-2).
I	A	3. In adults who use tobacco, a combination of behavioral interventions plus pharmacotherapy is recommended to maximize quit rates (S4.5-2, S4.5-3).
I	B-NR	4. In adults who use tobacco, tobacco abstinence is recommended to reduce ASCVD risk (S4.5-4, S4.5-5).
IIa	B-R	5. To facilitate tobacco cessation, it is reasonable to dedicate trained staff to tobacco treatment in every healthcare system (S4.5-1).
III: Harm	B-NR	6. All adults and adolescents should avoid secondhand smoke exposure to reduce ASCVD risk (S4.5-6).

4.6. Aspirin Use

Recommendations for Aspirin Use Referenced studies that support recommendations are summarized in Online Data Supplements 17 and 18.		
COR	**LOE**	**Recommendations**
IIb	A	1. Low-dose aspirin (75-100 mg orally daily) might be considered for the primary prevention of ASCVD among select adults 40 to 70 years of age who are at higher ASCVD risk but not at increased bleeding risk (S4.6-1–S4.6-8).
III: Harm	B-R	2. Low-dose aspirin (75-100 mg orally daily) should not be administered on a routine basis for the primary prevention of ASCVD among adults >70 years of age (S4.6-9).
III: Harm	C-LD	3. Low-dose aspirin (75-100 mg orally daily) should not be administered for the primary prevention of ASCVD among adults of any age who are at increased risk of bleeding (S4.6-10).

Top 10 Take-Home Messages for the **Primary Prevention** of Cardiovascular Disease

1. The most important way to prevent atherosclerotic vascular disease, heart failure, and atrial fibrillation is to promote a healthy lifestyle throughout life.

2. A team-based care approach is an effective strategy for the prevention of cardiovascular disease. Clinicians should evaluate the social determinants of health that affect individuals to inform treatment decisions.

3. Adults who are 40 to 75 years of age and are being evaluated for cardiovascular disease prevention should undergo 10-year (ASCVD) risk estimation and have a clinician–patient risk discussion before starting on pharmacological therapy, such as antihypertensive therapy, a statin, or aspirin.

4. All adults should consume a healthy diet that emphasizes the intake of vegetables, fruits, nuts, whole grains, lean vegetable or animal protein, and fish and minimizes the intake of trans fats, processed meats, refined carbohydrates, and sweetened beverages. For adults with overweight and obesity, counseling and caloric restriction are recommended for achieving and maintaining weight loss.

5. Adults should engage in at least 150 minutes per week of accumulated moderate-intensity physical activity or 75 minutes per week of vigorous-intensity physical activity.

6. For adults with type 2 diabetes mellitus, lifestyle changes, such as improving dietary habits and achieving exercise recommendations, are crucial. If medication is indicated, metformin is first-line therapy, followed by consideration of a sodium-glucose cotransporter 2 inhibitor or a glucagon-like peptide-1 receptor agonist.

7. All adults should be assessed at every healthcare visit for tobacco use, and those who use tobacco should be assisted and strongly advised to quit.

8. Aspirin should be used infrequently in the routine primary prevention of ASCVD because of lack of net benefit.

9. Statin therapy is first-line treatment for primary prevention of ASCVD in patients with elevated LDL cholesterol levels (≥190 mg/dL), those with DM who are 40 to 75 years of age, and those determined to be at sufficient ASCVD risk after a clinician–patient risk discussion.

10. Non-pharmacological interventions are recommended for all adults with elevated BP or HTN. For those requiring pharmacological therapy, the target blood pressure should generally be <130/80 mm Hg.