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Primary Prevention of Cardiovascular Disease

About the Guideline

- The Guideline on the Primary Prevention of Cardiovascular Disease, written by the American Academy of Cardiology (ACC) and American Heart Association (AHA) Task Force on Clinical Practice Guidelines, translates scientific evidence into useable guidelines to improve cardiovascular health with the goal of providing a foundation for delivery of quality cardiovascular care.
- The writing committee consisted of clinicians, cardiologists, health services researchers, epidemiologists, internists, nurses, and a lay representative.
- The guideline focuses on primary prevention in adults (≥ 18 years of age) to reduce the risk of atherosclerotic cardiovascular disease (ASCVD), including acute coronary syndrome, myocardial infarction, stable or unstable angina, arterial revascularization, stroke/transient ischemic attack, and peripheral vascular disease, as well as heart failure and atrial fibrillation.
- The guideline is a compilation of the most current research and outcomes for ASCVD related to nine topic areas: risk assessment, diet, exercise/physical activity, obesity and weight loss, type 2 diabetes mellitus (T2DM), blood cholesterol, hypertension, smoking cessation, and aspirin use.
- Patient/clinician shared decision making is emphasized utilizing a multidisciplinary approach.

Key Clinical Considerations

ASCVD Prevention Efforts

- A team-based approach incorporated with shared decision-making between clinician and patient is recommended for risk factor modification strategies.
- Social determinants of health (socioeconomic and educational status, cultural beliefs, and work/home environments) are incorporated into prevention efforts.
- ASCVD Risk Assessment
    - Risk assessment is the foundation of primary prevention
    - Major risk factors:
        - Tobacco use
        - Dyslipidemia
        - Hypertension
        - Type 2 diabetes mellitus
        - Chronic inflammation
    - ASCVD 10-year risk factor classification
        - Online risk calculator: http://tools.acc.org/ASCVD-Risk-Estimator-Plus/#!/calculate/estimate/
        - Low risk < 5%
        - Borderline risk 5% to <7.5%
        - Intermediate risk ≥ 7.5% to < 20%
        - High risk ≥ 20%
    - Adults 40 to 75 years of age should be assessed for traditional cardiovascular risk factors in order to calculate a 10-year risk of ASCVD.

  - Adults aged 20-39 years can be assessed every four to six years to optimize lifestyle choices, track risk factor progression, and implement treatment.
  - Consider estimating a lifetime or 30-year risk for ASCVD in adults 20 to 39 years and adults 40-59 who have <7.5% 10-year risk to reinforce importance of lifestyle recommendations.
  - Consider utilizing additional risk-enhancing factors to guide prevention strategies in adults with borderline risk (5% to <7.5% 10-year ASCVD risk) or intermediate risk (≥7.5% to < 20% 10-year ASCVD risk). Risk enhancing factors include:
    - Family history of premature ASCVD (men < 55 years of age/women < 65 years of age)
    - Persistently elevated low-density lipoprotein cholesterol (LDL-C) ≥ 160 mg/dL or non-high-density lipoprotein cholesterol (non-HDL-C) ≥ 190mg/dL
    - Chronic kidney disease (estimated glomerular filtration [eGFR] rate <60mL/min/1.73 m^2)
    - Metabolic syndrome
    - History of preeclampsia or early menopause (<40 years of age)
    - Inflammatory disease (i.e. rheumatoid arthritis, psoriasis, HIV)
    - Ethnicity (i.e. South Asian ancestry)
    - Persistently elevated triglycerides (≥ 175 mg/dL)
    - High-sensitivity C-reactive protein ≥ 2.0 mg/L
    - Lipoprotein (a) ≥ 50 mg/dL
    - Apolipoprotein B > 130 mg/dL
    - Ankle-brachial index (ABI) < 0.9
- Consider a coronary calcium score to guide shared decision-making discussions regarding preventative strategies in adults with intermediate risk (≥7.5 to 20% 10 -year ASCVD risk) or borderline risk (5% to <7.5% 10-year ASCVD risk).

Lifestyle Factors Affecting Cardiovascular Risk

- Dietary recommendations to reduce risk of ASCVD:
  - Consume a diet rich in vegetables, fruits, legumes, nuts, whole grains, and fish.
  - Replace saturated fats with monounsaturated and polyunsaturated fats.
  - Limit sodium intake to < 2,000 mg daily.
  - Limit intake of processed meats, refined carbohydrates, trans fats, and sweetened beverages.
- Exercise and physical activity recommendations to reduce risk of ASCVD:
  - Counsel adults to maintain a physically active lifestyle.
  - Encourage adults to engage in at least 150 minutes/week of accumulated moderate-intensity aerobic activity or 75 minutes of vigorous-intensity aerobic activity/week to reduce risk of ASCVD.
  - For those adults unable to achieve the above recommendation, encourage at least *some* level of moderate or vigorous intensity level of activity to decrease overall level of sedentary behavior.

Other Factors Attributing to ASCVD Risk

- Adults who are overweight and obese
  - Calculate body mass index (BMI) annually or more frequently if needed to identify adults who are overweight or obese.
  - Recommend weight loss through calorie restriction and comprehensive lifestyle counseling (i.e. regular self-monitoring of food intake, physical activity, and weight) for overweight (BMI ≥ 25 to 29.9 kg/m^2) and obese (BMI ≥ 30 kg/m^2) patients.
    - Clinically meaningful weight loss is defined as loss ≥ 5% of initial weight and has been proven to improve blood pressure, blood cholesterol, and glucose levels.
  - Measure waist circumference to identity adults at high cardiometabolic risk
    - Elevated waist circumference is classified as ≥ 40 inches in men and ≥ 35 inches in women.
  - Combining waist circumference and BMI is the best approach for assessing obesity-related risk.
- Adults with type 2 diabetes mellitus (hemoglobin A1C ≥ 6.5%)
  - Recommend a tailored nutrition plan and at least 150 minutes per week of moderate-intensity or 75 minutes of vigorous-intensity physical activity.
  - Recommended diets to improve glycemic control and achieve weight loss, if needed, include Mediterranean, Dietary Approaches to Stop Hypertension (DASH), and vegetarian/vegan diets.
  - Initiate metformin as first-line therapy in conjunction with lifestyle therapies at time of type 2 diabetes (T2DM) diagnosis to achieve optimal glycemic control and reduced ASCVD risk.
  - Consider initiating sodium-glucose cotransporter 2 (SGLT-2) inhibitor or a glucagon like peptide-1 receptor (GLP-1R) agonist therapy, if additional optimal glycemic control is not achieved with lifestyle interventions and metformin.
  - Enhancing risk factors in diabetic patients include:
    - T2DM duration ≥ 10 years or ≥ 20 years for type 1 diabetes mellitus (T1DM)
    - Albuminuria ≥ 30 mcg albumin/mg creatinine
    - eGFR < 60 mL/min/1.73 m^2
    - Retinopathy
    - Neuropathy
    - ABI < 0.9
- Adults with high blood cholesterol
  - In adults at intermediate risk (≥ 7.5% to < 20% 10-year ASCVD risk) initiate moderate-intensity statin and aim to reduce low-density lipoprotein (LDL-C) by 30% or more for optimal ASCVD risk reduction.
  - In adults at high-risk (≥ 20% 10-year ASCVD risk) aim to reduce LDL-C by 50% or more with statin therapy (high-intensity, if needed) for optimal ASCVD risk reduction.
  - Initiate moderate-intensity statin therapy regardless of 10-year ASCVD risk in adults 40 to 75 years of age with diabetes.
  - Recommend maximum tolerated statin therapy in adults aged 20-75 years of age with LDL-C level ≥ 190 ml/dL.

    - Recommendations regarding coronary calcium scoring and statin therapy
        - In adults with intermediate (≥ 7.5 to < 20% 10-year ASCVD risk) risk or borderline-risk (5% to < 7.5% 10-year ASCVD risk) and no risk enhancing factors, consider withholding statin therapy if calcium score is zero and reassess in 5 to 10 years.
        - Initiate statin therapy in adults ≥ 55 years of age if calcium score is 1 to 99.
- Adults with high blood pressure or hypertension
    - Hypertension is defined as systolic blood pressure ≥ 130 mm Hg or diastolic blood pressure ≥ 80 mm Hg.
    - Nonpharmacological interventions for all adults with elevated blood pressure or hypertension:
        - Weight loss
        - Heart-healthy diet
        - Sodium reduction
        - Dietary potassium supplementation
        - Engagement in a structured exercise program
        - Limited alcohol intake
    - Initiate anti-hypertensive medications in adults with ≥ 10% 10-year ASCVD risk and an average systolic blood pressure ≥ 130 mm Hg or diastolic blood pressure ≥ 80 mm Hg.
    - Therapeutic goal is to maintain blood pressure < 130/80 mm Hg, including adults with chronic kidney disease and T2DM.
    - Initiate anti-hypertensive medications in adults with ≤ 10% 10-year ASCVD risk and systolic blood pressure ≥ 140 mm Hg or diastolic blood pressure ≥ 90 mm Hg.
- Treatment of tobacco use
    - Assess tobacco use at every healthcare visit and firmly advise smoking cessation.
    - Recommend a combination of behavioral interventions plus pharmacotherapy.
    - Pharmacotherapy
        - Nicotine replacement therapies: patch, gum, lozenge, nasal spray, oral inhaler
        - Other: bupropion, varenicline
    - Complete tobacco abstinence is recommended to decrease ASCVD risk.
    - All healthcare systems should consider supporting dedicated trained staff for promotion of tobacco cessation and treatment of tobacco addiction.
- Aspirin Use
    - Consider low-dose aspirin (75-100 mg daily) for the primary prevention of ASCVD in adults 40 to 70 years of age who are at increased risk of ASCVD, but not classified as high bleeding risk.
    - Low-dose aspirin therapy is not recommended as primary prevention in adults > 70 years of age or among adults of any age who are at increased risk of bleeding.

Reference:

Arnett, D.K., Blumenthal, R.S., Albert, M.A., Michos, E.D., Buroker, A.B., Midedema, M.I., Wijeysundrea, D.N. (2019). 2019 ACC/AHA Guideline on the primary prevention of cardiovascular disease. *Journal of the American College of Cardiology*. doi.org/10.1016/j.jacc.2019.03.010

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