

## Medical Guidelines

## Guidelines for Primary Prevention of Atherosclerotic Cardiovascular Disease

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The following guidelines for prevention of primary ASCVD have been extracted from European Society of Cardiology (ESC), American Heart Association (AHA), American College of Cardiology (ACC) and United States Preventive Services Task Force (USPSTF) guidelines.

Various manifestations of ASCVD include stable angina, myocardial Infarction, acute coronary syndrome (ACS), heart failure, atrial fibrillation, transient ischemic attacks, ischemic stroke, renovascular hypertension, erectile dysfunction, intermittent claudication, critical limb ischemia, and gangrene. ASCVD leads to significant morbidity, mortality, and economic burden.

Primary Prevention of ASCVD aims at minimizing the development and slowing the progression of atheroma in blood vessels through lifestyle changes and medications if needed. Identifying persons early for presence ASCVD risk factors, calculating their 10 year and lifetime risk of having first event through one of the "Risk Estimators" available online and recommending evidence-based interventions can save lives, improve quality of life, and reduce the cost to cater for manifest disease later.

These guidelines will help devise preventive strategies in collaboration with local healthcare authorities, patients, and primary care physicians. Ethnic diversity, financial distress, lower education and health literacy level, cultural influences and other socioeconomic factors are barriers to implement and follow these guidelines locally. A stepwise approach to primary prevention involves knowing the risk factors, screening individuals at risk, calculating ASCVD risk, maintaining healthy weight through lifestyle changes, and treating Diabetes, Hypertension, and Dyslipidaemias when indicated based on ASCVD risk score and presence of other risk

enhancing factors.

**1. Know the ASCVD Risk Factors**

1.1 Traditional Risk Factors, Physical inactivity, Obesity and overweight, Smoking, Diabetes Mellitus, Hypertension, Dyslipidaemia.

1.2 Emerging Risk Factors

Pre-term delivery, Pregnancy induced hypertension, Gestational Diabetes Mellitus, Premature menopause (< 40 years of age), Breast cancer treatment, Autoimmune Disorders, Depression.

1.3 Risk Enhancers

South Asian Ancestry, Premature coronary disease history in family (Women < 55 Years, Men < 65 years), chronic kidney disease, Metabolic syndrome, Hs-CRP > 2.0 mg/L, Lp(a) levels > 50 mg/dL, ApoB > 130 mg/dL, Albuminuria  $\geq$  30 mg Albumin / mg Creatinine, Ankle Brachial Index (ABI) < 0.9

**2. Identify those at Risk**

2.1 All adults aged 20-39 years must be evaluated every 4-6 years for identification of traditional major risk factors. It provides foundation for optimizing lifestyle and pursuing the progression of risk factors.

2.2 For those aged 20-39 years calculate lifetime risk of having first ASCVD event.

2.3 For those aged 40 to 75 years primary care physicians must regularly evaluate for traditional risk factors and estimate their 10 years risk for ASCVD.

**3. Estimate/Calculate ASCVD risk of Individual**

3.1 Use any of the followings online or paper chart risk calculators for estimation of 10

- years risk of ASCVD among asymptomatic adults aged 40-79 years.  
[www.med-decisions.com/or](http://www.med-decisions.com/or)  
[www.absoluterisk.com/or](http://www.absoluterisk.com/or)  
<https://tools.acc.org/ascvd-risk-estimator-plus/or>  
<https://www.mdcalc.com/framingham-risk-score-hard-coronary-heart-disease>).
- 3.2 Adults must be categorized into four groups based on 10 year ASCVD risk: High ( $\geq 20\%$ ), Intermediate ( $\geq 7.5$  to  $< 20\%$ ), borderline (5 to  $< 7.5\%$ ), low ( $< 5\%$ ).
  - 3.3 These estimators may under or over-estimate the risk in some subgroups e.g., those with low socioeconomic status, HIV infection, chronic inflammation, and autoimmune diseases. These should be considered when using these calculators.
  - 3.4 Use added discrete “risk-increasing” clinical features to review and then review the ten years risk for ASCVD estimates.
  - 3.5 Among individuals in the intermediate or borderline risk a computed tomography derived Coronary Artery Calcium scores (CACs) may be considered to reclassify the risk estimate upward (especially when score is  $\geq 100$  or  $\geq 75$ th age/ race /sex percentile) or downward (when CACs = 0). Measurement of CAC is not envisioned as definite test for “Screening” to diagnose all, but helps to select patients for discussion regarding treatment.
4. **Regular Physical Activity**
    - 4.1 A regular physical activity is mainstay for prevention of ASCVD.
    - 4.2 To reduce sedentary time a combination of aerobic physical activity with resistance exercises is recommended for all adults.
    - 4.3 Attaining and upholding an appropriate weight using lifestyle changes helps to maintain BP, lipids, and glycemic control and to reduce risk of ASCVD.
    - 4.4 Adult population must involve in a minimum of 2.5 hours/week of moderate or 1.25 hours/week of vigorous level exercise consisting of resistance physical activity.
  5. **Obesity and Weight Management**
    - 5.1 The desired weight loss ( $\geq 5\%$  initial weight) clinically, is linked to improve the glucose, BP, LDL-C levels among overweight/obese individuals, thus considerably delay both the T2DM and ASCVD.
    - 5.2 Additionally with exercise and balanced diet, FDA approved bariatric surgery, and pharmacological therapeutics may have a part in losing weight among targeted individual.
6. **Diet and Nutrition**
    - 6.1 All adults must consume Mediterranean-like diet or healthy plant-based vegetables rich, nuts, lean vegetable, fruits, whole grains, vegetable fiber and animal protein especially fish.
    - 6.2 Minimize red meat, refined carbohydrates, and sweetened beverages and processed red meats.
    - 6.3 Caloric restriction and counseling is recommended to achieve the weight loss.
  7. **Smoking and Tobacco**
    - 7.1 Smokeless tobacco (e.g. chewable) and smoked tobacco enhances the mortality risk for all causes of ASCVD.
    - 7.2 Electronic cigarettes to be exact “electronic nicotine delivery system (ENDS)” including vaping can increase the pulmonary diseases and risk of CVD.
    - 7.3 All adults must be evaluated for consumption of tobacco at every step, and if needed be aided and be assisted and powerfully directed to quit smoking.
  8. **Diabetes Mellitus**
    - 8.1 Lifestyle changes are crucial to control DM.
    - 8.2 When medical therapy is indicated Metformin remains the first choice.
    - 8.3 Two new classes of medicines have shown additional benefits to reduce cardiovascular mortality and morbidity in diabetics.
    - 8.4 SGLT-2 inhibitors in many published randomized control trials reduce heart failure and ASCVD events besides HbA1c and weight reduction.
    - 8.5 GLP-1R agonists have been found to remarkably decrease the risk of ASCVD events in adults along with decline in risk of ASCVD among T2DM.
  9. **Lipids and Statins**
    - 9.1 For those individuals who are  $< 19$  years of age and have family history of hypercholesterolemia, treatment with statins is indicated.
    - 9.2 For young adults (ages 20-39 years), estimate risk for lifetime and promote a healthy lifestyle.
    - 9.3 For those having a family history of premature ASCVD and LDL-C  $\geq 160$  mg/dl statin therapy should be considered
    - 9.4 In those individuals with Low ASCVD Risk (5% to  $< 7.5\%$ ), if Risk Enhancing Factors are present, discuss moderate-intensity statin
    - 9.5 Consider coronary CACs in select cases.

- CACs = 0, can avoid statins and repeat CAC in next 5-10 years.  
 CACs 1-100 initiate moderate-intensity statin for those persons  $\geq 55$  years  
 CACs >100 or 75th percentile or higher, use statin at any age.
- 9.6 Intermediate Risk ( $\geq 7.5\%$ -20%): Risk discussion: Use moderate-intensity statins and increase to high-intensity with risk enhancers
- 9.7 Risk  $\geq 20\%$  (high risk). Risk discussion with patient to initiate high-intensity statin to reduce LDL-C by  $\geq 50\%$
- 10. Hypertension**
- 10.1 In those patients if they are having ten percent or elevated risk of ASCVD, use medications for lowering BP are suggested to have a target BP of <130/80 mm Hg also includes patients having diabetes or chronic kidney disease.
- 10.2 A target of <130/80 mm Hg is also suggested for Grade II hypertension, with definite BP  $\geq 140/90$  mm Hg using non-pharmacological and BP-lowering agents.
- 11. Aspirin**
- 11.1 Aspirin must not be administered in low dose for primary prevention of ASCVD among adults of any age having a higher risk of bleeding.
- 11.2 Low-dose aspirin can be used for primary prevention of ASCVD in select adults who are of age 40-70 years and having high ASCVD risk and are not at increased bleeding risk.
- 11.3 For those aged 40-59 years Aspirin could be used in those at moderate to high ASCVD risk (10-year Risk > 10%)
- 11.4 Should consider stopping aspirin in those aged  $\geq 75$  years.
- 12. Stress and Depression**  
 Psychological stress and frailty must be considered a Risk Enhancing Factor for ASCVD and addressed in all preventive strategies.
- 13. Air pollution and Environment**  
 Environmental pollution is linked with ASCVD risk. Air pollution also enhances ASCVD risk and contributes in mortality, morbidity. Community and local health authorities must join hands to minimize the pollution.
- A team based and patient centred approach where decisions are shared, and targets set works better. Environmental, psychosocial, economic, and cultural aspects must be considered. Family and social support helps to achieve these targets. Decision to start medications such as Aspirin and Statins for primary prevention must be based on 10 year or lifetime ASCVD risk and after physician patient discussion.