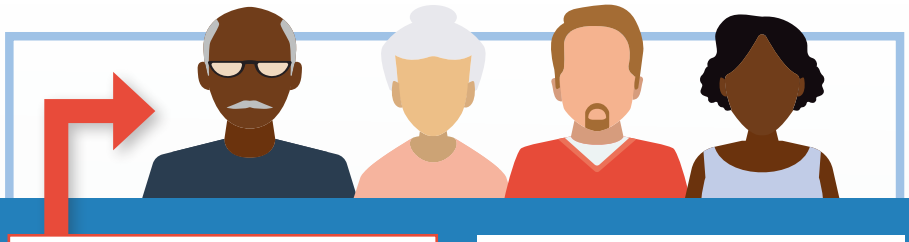
Coronary Artery Calcium Scoring to Guide Prevention of ASCVD

An Expert Panel of the National Lipid Association reviewed the evidence related to the use of coronary artery calcium (CAC) scoring in clinical practice for adults seen for primary prevention of atherosclerotic cardiovascular disease. Recommendations for optimal use of this test in adults of across multiple domains of primary prevention are provided.

Highlights



CAC scoring strongly informs ASCVD risk discrimination and reclassification.

CAC scoring aids in ASCVD risk prediction, ***regardless of race, gender or ethnicity.***

CAC scoring aids the clinician to allocate statin therapy based on ASCVD risk.

CAC Score

Add-on Rx

Very high CAC scores may inform decision-making about add-on therapies to statins.

CAC scoring aids decision-making about aspirin therapy.

When to consider the use of CAC scoring

For adults with clinical ASCVD, CAC scoring is not recommended.

- For adults 40–75 years of age, with LDL-C 70–189 mg/dL and a 10-year ASCVD of 5–19.9%, CAC scoring can be useful to decide on the need for and intensity of preventive therapies.
  - For adults with a 10-year ASCVD risk of <5%, CAC scoring is reasonable in those with a family history of premature ASCVD, to decide on the need for and intensity of preventive therapies.

Special considerations for race/ethnicity, sex, and age

- Relative ASCVD risk increases proportionally with CAC scores similarly with all races and ethnicities. For a given CAC score incidence rates of CVD and all-cause mortality are higher in Blacks and Hispanics compared to Whites and Asians.

RECOMMENDATION:
*Clinicians should **use CAC scoring, when indicated, for ASCVD risk assessment,** regardless of the patient's race/ethnicity or gender.*

RECOMMENDATION:
*In selected **individuals <40 years of age with multiple major ASCVD risk factors** or a family history of premature ASCVD, **it is reasonable to use CAC>0 as a factor favoring intensification** of lifestyle therapy and, if necessary, initiation of statin therapy.*

RECOMMENDATION:
*In **adults 76–80 years of age with an LDL-C of 70–189 mg/dL in whom the decision to employ statin therapy is uncertain,** CAC scoring is useful in ASCVD risk reclassification.*

Definition, prognostic significance and treatment of those with a high CAC score, multivessel involvement or left main coronary calcification

- For a given CAC score, a diffuse distribution of CAC suggests higher risk than more localized CAC.
- The presence of left main coronary calcification, especially when >25% of the total score is in the left main, suggests higher risk.
- A CAC score ≥300 is associated with proportionately higher ASCVD risk than those with scores >100, a finding suggesting benefit from greater LDL-C lowering.
- A CAC score ≥1000 is associated with an annual risk similar to that of the placebo group in the FOURIER trial, a finding consistent with the potential value of very aggressive LDL-C lowering along with other ASCVD risk reduction strategies.

RECOMMENDATION:
In adults with predominant left main coronary calcification, multi-vessel coronary involvement, or a high CAC score, stress testing or invasive coronary arteriography, in the absence of clinically relevant symptoms, is not recommended.

RECOMMENDATION:
In adults with CAC scores ≥ 100, initiation of statin therapy is recommended.

RECOMMENDATION:
In adults with CAC scores ≥300, and especially in those with CAC scores ≥ 1000, it is reasonable to use high intensity statin therapy, and if necessary, guideline-based add-on LDL-C lowering therapies to achieve a ≥50% reduction in LDL-C, and optimally an LDL-C <70 mg/dL.

CAC scoring in patients with severe primary hypercholesterolemia

- Limited data on CAC scoring in individuals with LDL-C ≥190 mg/dL indicate that CAC scoring may aid in both short- and intermediate-term ASCVD risk prediction.
- In individuals with severe primary hypercholesterolemia, the finding of CAC = 0 does not preclude the need for long term evidence-based LDL-C lowering therapy.

RECOMMENDATION: *In selected adults with severe primary hypercholesterolemia, in the absence of extreme LDL-C elevation, additional major ASCVD risk factors or a family history of premature ASCVD, CAC scoring may be reasonable to inform decision-making about the need for add-on therapy to maximally tolerated statins.*

CAC scoring in patients with diabetes mellitus

- In adults 40–75 years of age with type 2 diabetes age in whom the decision has been made to initiate statin therapy, it is reasonable, for those with a CAC score >100, to choose a high-intensity statin.
- In adults 30–39 years of age with long-standing diabetes (type 1 diabetes of ≥20 years duration or type 2 diabetes of ≥10 years duration) and risk factors or microangiopathy, CAC scoring may be reasonable to aid in ASCVD risk stratification and statin treatment shared decision making.

Use of CAC scoring in allocation of aspirin therapy

- In patients with CAC ≥ 100, therapy with aspirin 81 mg daily is reasonable for those who do not have bleeding-related contraindications to such therapy.

Read the National Lipid Association's complete Scientific Statement in the Journal of Clinical Lipidology.

Orringer CE, Blaha MJ, Blankstein R, Budoff MJ, Goldberg RB, Gill EA, Maki KC, Mehta L, Jacobson TA, The National Lipid Association Scientific Statement on Coronary Artery Calcium Scoring to Guide Preventive Strategies for ASCVD Risk Reduction, Journal of Clinical Lipidology (2021), doi: https://doi.org/10.1016/j.jacl.2020.12.005.

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