

The Coronary Artery Disease (CAD) Clinical Practice Guideline is based on the 2010 Kaiser Permanente National CAD Guideline. It was developed to assist physicians and other health care professionals in the treatment of CAD in the outpatient primary care setting. Following an updated evidence review, the recommendations remain the same as in the 2008 guideline.

### Definition of CAD

This guideline describes secondary prevention measures for patients with a diagnosis of ischemic heart disease based upon a history of angina, myocardial infarction (MI), coronary artery bypass surgery graft (CABG), percutaneous coronary intervention (PCI), or evidence of coronary artery disease on angiography or noninvasive testing.

### Screening for CAD

Exercise stress testing, CT angiography, and coronary artery calcium scoring are NOT recommended for screening asymptomatic individuals for CAD.

### Pharmacologic Management

#### ANTIPLATELET THERAPY

##### Aspirin

For all patients with CAD, daily aspirin is recommended indefinitely, unless there is clear contraindication such as active bleeding, major coagulopathy, or true aspirin allergy.

For CAD patients on concomitant ACE Inhibitors, low-dose aspirin (81mg) is recommended.

For the initial six months following coronary artery stent placement, aspirin (81–325mg) is recommended. Following this period, aspirin (81–162mg) is recommended.

For all other patients with CAD, in whom aspirin therapy is being initiated, daily aspirin (81–162mg) is recommended.

##### Clopidogrel Use in Stable Patients

For stable CAD patients who tolerate aspirin well (and who are not post-procedure), clopidogrel is **NOT** recommended as either a substitute for or in addition to aspirin.

For stable CAD patients in whom aspirin is contraindicated, clopidogrel is recommended as the antiplatelet of choice.

##### Antiplatelet Therapy after Stent Placement

Aspirin therapy is recommended indefinitely, regardless of stenting status.

Following coronary artery bare metal stent placement, clopidogrel plus aspirin is recommended for at least four weeks.

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Following drug-eluting stent (DES) placement, uninterrupted dual treatment with clopidogrel and aspirin is recommended for at least 12 months.

Clinicians who perform invasive or surgical procedures and are concerned about peri-procedural and post-procedural bleeding must be made aware of the potentially catastrophic risk of premature discontinuation of clopidogrel in the first year following coronary DES placement.

For patients who receive a drug-eluting stent and who must have procedures that mandate stopping clopidogrel therapy, it is recommended that aspirin should be continued if at all possible, and the clopidogrel restarted as soon as possible after the procedure.

Any elective procedures which would require stopping or interrupting this therapy (dental work, colonoscopy, or other surgical procedures) should be delayed until after one year (12 consecutive months) of clopidogrel treatment.

It is strongly recommended that patients taking clopidogrel consult with their treating cardiologist before stopping this medication, even if instructed to do so by another healthcare provider.

If a rash occurs after clopidogrel use, patients may be switched to ticlopidine.

## (ORAL) ANTICOAGULANT THERAPY

### Aspirin versus Oral Anticoagulant Therapy

In CAD patients who are not at increased embolic risk and who tolerate aspirin, aspirin is recommended in preference to both oral anticoagulant therapy and the combination of aspirin and oral anticoagulant therapy.

### Aspirin Plus Oral Anticoagulant Therapy

Unless contraindicated, aspirin is recommended for patients with established CAD receiving warfarin for thromboembolic prophylaxis.

NOTE: Use of warfarin in conjunction with aspirin and/or clopidogrel is associated with increased risk of bleeding.

### Post-Myocardial Infarction

For post-MI patients with left ventricular thrombus, warfarin is recommended, unless contraindicated.

For post-MI patients with large transmural anterior infarctions, long-term warfarin therapy may be used in consultation with cardiology.

NOTE: Use of warfarin in conjunction with aspirin and/or clopidogrel is associated with increased risk of bleeding.

## ANGIOTENSIN-CONVERTING ENZYME (ACE) INHIBITOR

For patients with CAD, with or without left ventricular systolic dysfunction (LVSD), Angiotensin-Converting Enzyme (ACE) Inhibitor therapy is recommended for long term use, unless contraindicated.

NOTE: For patients on concomitant aspirin, low-dose aspirin (81mg) is recommended to preserve ACE inhibitor benefit.

## ANGIOTENSIN II RECEPTOR BLOCKER (ARB)

ARB therapy is recommended for CAD patients who are intolerant to ACE Inhibitors and have the following comorbidities:

- ▶ Diabetes with hypertension and microalbuminuria (or albuminuria)
- ▶ Left ventricular ejection fraction  $\leq$  40% (LVSD)

For patients with CAD and hypertension (without LVSD, microalbuminuria, or diabetes) who are intolerant to ACE Inhibitors, ARB therapy is an option equal to other antihypertensive medications.

For all other patients with CAD who are intolerant to ACE Inhibitors, there is insufficient evidence to recommend for or against ARB therapy.

## BETA-BLOCKERS

Non-intrinsic sympathomimetic activity (non-ISA) beta-blocker therapy is recommended, unless contraindicated.

For patients with two or more risk factors for CAD, beta-blocker therapy is recommended peri-operatively for vascular surgery.

CAD risk factors include: age  $\geq$  65 years, hypertension, current smoking, serum cholesterol  $\geq$  240 mg/dL (6.2 mmol/L), and diabetes mellitus.

NOTE: Drugs **without** ISA are atenolol, betaxolol, bisoprolol, carvedilol, labetalol, nadolol, metoprolol, propanolol, and timolol. Drugs **with** ISA are acebutolol and pindolol.

## Reversible Airway Disease or Chronic Obstructive Pulmonary Disease (COPD)

Cardioselective beta-blockers are recommended for CAD patients with concomitant mild to moderate reversible airway disease or COPD.

Discuss the risks and benefits of treatment with the patient and instruct the patient to report any increase in airway symptoms.

Beta-blocker therapy is **NOT** recommended:

- ▶ For patients with severe airway disease requiring frequent hospitalization or intubation.
- ▶ During acute exacerbation of airway disease.
- ▶ When airway disease is unstable or poorly controlled.

## CAD and Heart Failure

For CAD patients with either left ventricular systolic dysfunction (LVSD) (NYHA Class II-IV) or asymptomatic LVSD (NYHA Class I), beta blockers are strongly recommended.

For CAD patients with left ventricular systolic dysfunction, carvedilol, metoprolol succinate, or bisoprolol is the recommended choice of beta blocker therapy.

## CALCIUM CHANNEL BLOCKERS (CCB)

### CAD Patients with Normal Ventricular Systolic Function

Calcium channel blockers are **NOT** recommended to reduce morbidity or mortality from CAD.

In CAD patients with normal ventricular systolic function, calcium channel blockers may be used for the treatment of angina pectoris or hypertension when beta blockers and ACE inhibitors are ineffective or contraindicated.

In patients with CAD, immediate release formulations of nifedipine are **NOT** recommended due to the increased risk of cardiovascular mortality.

## CAD Patients with Left Ventricular Systolic Dysfunction (LVSD)

Amlodipine\* and felodipine\* (second generation dihydropyridine calcium channel blockers) are options for the treatment of angina pectoris or hypertension in patients with LVSD.

Calcium channel blockers other than amlodipine\* and felodipine\* are **NOT** recommended in patients with LVSD.

\* Not FDA-approved for heart failure.

## HORMONE REPLACEMENT THERAPY (HRT)

Unopposed estrogen therapy and estrogen and progestin combination therapy are NOT recommended for the prevention of cardiovascular events in postmenopausal women.

Women taking HRT solely to prevent cardiovascular events are strongly recommended to discontinue therapy. Women are advised to discontinue use either all at once or by tapering the dose.

## Lipid Management

### Acute Management — Statin Initiation

In patients with acute coronary syndromes, treatment with a statin should be initiated as soon as possible, regardless of baseline LDL-C.

### Statin Treatment

- ▶ Reducing LDL-C is the primary focus of treatment.
- ▶ Because of its proven effectiveness in event reduction, safety and cost, simvastatin is the preferred first-line statin.
- ▶ Initiate statins at a dose sufficient to reduce LDL-C to <100 mg/dL and by at least 30–40%. Treatment is recommended even if baseline LDL-C is <100 mg/dL. If baseline LDL-C is <160 mg/dL initiate simvastatin at 40 mg. If baseline LDL-C is >160 mg/dL, initiate simvastatin at 80 mg.
- ▶ In people with established CAD, an LDL-C goal of <70 mg/dL is optional.
- ▶ When the LDL-C goal is achieved, reassess LDL-C annually to ensure that the patient remains at goal; it is optional to repeat the lipid panel in 3-6 months.

Since statin therapy is recommended for all patients with CAD, there is no role for a trial of lifestyle intervention alone prior to the initiation of statin therapy in patients with CAD.

For additional information and specific cholesterol management strategies, refer to the **Adult Cholesterol Management Clinical Practice Guideline**.

## Hypertension: Target Blood Pressure

The optimal goal blood pressure for patients with CAD or CAD risk equivalents (AAA, peripheral arterial disease, or carotid arterial disease) is <130/80 mm Hg.

The optimal goal blood pressure for patients with CAD and diabetes or renal disease is <130/80 mm Hg.

For additional information and specific hypertension treatment strategies, refer to the **Hypertension Clinical Practice Guideline**.

## Depression

### Mental Health Outcomes:

Treatment of depression in CAD patients should be based on the patients' mental health condition(s), for the purpose of improving mental health outcomes.

### Cardiovascular Outcomes:

Cognitive behavioral therapy is not recommended for the purpose of improving cardiovascular outcomes in post-MI patients with depression.

There is insufficient evidence to recommend treating depression in patients with CAD, who are not post MI, with cognitive behavioral therapy in order to improve cardiovascular outcomes.

There is insufficient evidence to recommend treating depression in patients with CAD with anti-depressant medications in order to improve cardiovascular outcomes.

For additional information and specific depression treatment strategies, refer to the **Depression Clinical Practice Guideline**.

## Lifestyle Modifications

### Diet Therapy

A diet rich in fruits, vegetables, legumes, nuts, whole grains, and n-3 (or omega-3) polyunsaturated fat is recommended.

### Dietary Fat Modification

For patients consuming a usual Western diet, the following modifications in dietary fat are recommended:

- ▶ Increase intake of n-3 (or omega-3) polyunsaturated fatty acids to a level of ~ 1 g /day from a variety of sources (flaxseed, canola, and soybean oils, nuts, fish, and fish oil supplements).
- ▶ Replace saturated fatty acids with polyunsaturated and monounsaturated fatty acids.
- ▶ Reduce or eliminate intake of trans-fatty acids.

### Dietary Supplements

Supplemental vitamins C, E, and beta carotene are NOT recommended for prevention of cardiovascular mortality or subsequent coronary events.

Supplemental folic acid, vitamin B6, and/or vitamin B12 are **NOT** recommended.

### Smoking Cessation

Complete smoking cessation is strongly recommended.

### Exercise

30 to 60 minutes of supervised or unsupervised exercise (walking, jogging, cycling, or other aerobic activity) at least three to four times weekly is recommended.