Coronary Artery Disease (CAD)
Clinician Guide

Introduction
This Clinician Guide is based on the 2017 KP National Coronary Artery Disease Guideline. It was developed to assist primary care physicians and other healthcare professionals in the outpatient treatment of CAD in adults aged ≥ 18 years. For the 2017 update, the KP National Coronary Artery Disease Guideline adapted and/or adopted multiple external guidelines. These included the 2011 American Heart Association/American College of Cardiology Foundation (AHA/ACCF) guideline, the 2014 and 2016 American College of Cardiology/American Heart Association (ACC/AHA) guidelines, the 2013 European Society of Cardiology (ESC) guideline, and the 2016 United States Preventive Services Task Force (USPSTF) recommendation. It is not intended or designed as a substitute for the reasonable exercise of independent clinical judgment by practitioners.

Definitions
▸ Clinical Coronary Artery Disease (CAD) includes acute coronary syndromes, history of MI, stable or unstable angina, and/or coronary revascularization.
▸ Clinical Atherosclerotic Cardiovascular Disease (ASCVD) includes acute coronary syndromes, history of myocardial infarction (MI), stable or unstable angina, coronary or other arterial revascularization, stroke, transient ischemic attack (TIA), carotid stenosis ≥ 50%, or symptomatic peripheral arterial disease presumed to be of atherosclerotic origin.

Key Points
▸ Recommend a diet rich in fruits, vegetables, legumes, nuts, whole grains, and n-3 (omega-3) polyunsaturated fatty acids for individuals with CAD.
▸ Recommend 30 to 60 minutes of exercise at least five to seven times weekly for individuals with CAD.
▸ Initiate aspirin (81mg) in individuals with clinical CAD.
▸ Initiate high-intensity statin therapy in individuals with clinical CAD.
▸ Initiate dual antiplatelet therapy with aspirin plus a P2Y12 inhibitor following coronary stent placement.
▸ Offer referral to comprehensive cardiovascular rehabilitation programs to patients with clinical CAD.

Depression in CAD

Mental Health Outcomes
▸ In CAD patients, consider initiating depression treatment based on the patients’ mental health condition(s) to improve mental health outcomes.

Cardiovascular Health Outcomes
▸ Treating depression in post-MI patients with cognitive behavioral therapy has not been shown to improve cardiovascular outcomes.
There is no recommendation for or against treating depression in patients with CAD who are not post-MI with cognitive behavioral therapy to improve cardiovascular outcomes.

There is no recommendation for or against treating depression in patients with CAD with antidepressant medications to improve cardiovascular outcomes.

### Screening for CAD

- For asymptomatic men and women with no history of CAD, there is no recommendation for or against the use of screening using nontraditional risk factors to prevent CAD events.
  - Nontraditional risk factors include: high-sensitivity C-reactive protein (hs-CRP), ankle-brachial index (ABI), leukocyte count, fasting blood glucose level, periodontal disease, carotid intima-media thickness (carotid IMT), coronary artery calcification (CAC) score on electron beam computed tomography (EBCT), homocysteine level, and lipoprotein(a) level.
- For asymptomatic adults at low risk for CAD events, do not screen with resting or exercise electrocardiography (ECG).
- For asymptomatic adults at intermediate or high risk for CAD events, there is no recommendation for or against screening with resting or exercise ECG.

### ACE Inhibitor and ARB Therapy

- Prescribe angiotensin-converting enzyme inhibitors (ACEI), or angiotensin receptor blockers (ARBs) if intolerant to ACEI, for patients with CAD and left ventricle ejection fraction (LVEF) ≤ 40%, hypertension, chronic kidney disease, or diabetes.
- Consider prescribing ACEI for patients with CAD and LVEF > 40%.
  - For patients who are intolerant to ACEI, it is unclear if ARBs should be used.
- Consider avoiding combined use of an ACEI and an ARB.

### Antiplatelet Therapy

#### Aspirin Therapy at 81mg Orally Daily

**Clinical ASCVD**
- Initiate aspirin (81mg) in individuals with clinical atherosclerotic cardiovascular disease (ASCVD), which includes acute coronary syndromes, history of myocardial infarction (MI), stable or unstable angina, coronary or other arterial revascularization, stroke, transient ischemic attack (TIA), carotid stenosis ≥50%, or symptomatic peripheral arterial disease presumed to be of atherosclerotic origin.
  - For individuals already taking anticoagulants (eg, coumadin or dagibitran for atrial fibrillation), the balance between benefits and harms often favors adding aspirin therapy after an individualized assessment of the patient’s preferences and clinical circumstances.

**Subclinical ASCVD**
- Consider aspirin (81mg) in individuals with subclinical ASCVD, which includes asymptomatic coronary artery disease or peripheral artery disease, eg, aortic atherosclerosis or abnormal ankle brachial index (ABI) detected on screening.
Stable CAD

- In stable CAD patients who tolerate aspirin well and are not post-stent, clopidogrel as either a substitute for or in addition to aspirin 81mg is generally not recommended.
  - In the subset of people with both atrial fibrillation and stable CAD who are > 12 months after an acute coronary event but without coronary stents, consider anticoagulation alone without an antiplatelet agent to avoid a higher risk of bleeding.
- In stable CAD patients who are allergic to aspirin, consider prescribing clopidogrel.

Patients with NSTE-ACS

- In patients with non-ST elevation acute coronary syndrome (NSTE-ACS) treated with medical therapy alone (without revascularization), consider using ticagrelor as an acceptable alternative to clopidogrel for maintenance P2Y12 therapy, in combination with aspirin 81mg.

Anticoagulation Post-MI

- For post-MI patients with left ventricular thrombus, consider prescribing warfarin unless contraindicated.
- For post-MI patients with large transmural anterior infarctions, consider long term warfarin therapy in consultation with cardiology.

ANTIPLATELET THERAPY – POST STENT PLACEMENT

Dual Antiplatelet Therapy (DAPT): P2Y12 Inhibitors

- Following coronary stent placement, prescribe dual antiplatelet therapy with aspirin plus a P2Y12 inhibitor.
- Prescribe clopidogrel as the preferred P2Y12 inhibitor.
- Consider prescribing prasugrel or ticagrelor as acceptable alternatives.
- Consider ticagrelor in preference to clopidogrel in patients with ACS (NSTE-ACS or ST-segment elevation MI [STEMI]) treated with DAPT after coronary stent implantation who are not at a high risk of bleeding.
- Consider prasugrel in preference to clopidogrel in patients with ACS (NSTE-ACS or STEMI) after coronary stent implantation who have no history of stroke or TIA, are aged < 75 years, and weigh ≥ 60 kg.
- Do not prescribe ticagrelor in patients with a history of intracranial hemorrhage (ICH), active pathological bleeding, or severe hepatic insufficiency.
- Do not administer prasugrel to patients with active pathological bleeding or patients with a prior history of stroke or TIA.
- Do not administer prasugrel to patients aged ≥ 75 years or who weigh < 60 kg because of the risk of fatal or intracranial hemorrhage and uncertain benefit, except in high risk patients (e.g., those with diabetes or prior myocardial infarction).
- For patients who suffer stent thrombosis while on a combination of clopidogrel plus aspirin 81mg or at high risk for stent thrombosis, consider prescribing prasugrel or ticagrelor plus aspirin 81mg.
Antiplatelet Therapy Post Stent: Duration of Dual Antiplatelet Therapy, Stable Ischemic Heart Disease (SIHD)

▸ Prescribe DAPT for a minimum of 1 month in patients with SIHD treated with a bare metal stent (BMS).
  • Consider treatment for longer than 1 month in patients who have tolerated DAPT without a bleeding complication and who are not at a high risk of bleeding (e.g., prior bleeding on DAPT, coagulopathy, oral anticoagulant use).

▸ Prescribe DAPT for a minimum of 6 months in patients with SIHD treated with a drug-eluting stent (DES).
  • Consider treatment for longer than 6 months in patients who have tolerated DAPT without a bleeding complication and who are not at a high risk of bleeding (e.g., prior bleeding on DAPT, coagulopathy, oral anticoagulant use).

▸ In patients with SIHD treated with DAPT after DES implantation who develop a high risk of bleeding (e.g., treatment with oral anticoagulant therapy), are at high risk of severe bleeding complication (e.g., major intracranial surgery), or develop significant overt bleeding, consider discontinuation of P2Y12 inhibitor therapy after 3 months.

Antiplatelet Therapy Post Stent: Duration of Dual Antiplatelet Therapy, Acute Coronary Syndrome (NSTE-ACS or STEMI)

▸ Prescribe DAPT for a minimum of 12 months in patients with ACS after BMS or DES implantation.
  • Consider prescribing DAPT for longer than 12 months in patients with ACS treated with coronary stent implantation without a bleeding complication and who are not at high risk of bleeding (e.g., prior bleeding on DAPT, coagulopathy, oral anticoagulant use).

▸ In patients with ACS treated with DAPT after DES implantation who develop a high risk of bleeding (e.g., treatment with oral anticoagulant therapy), are at high risk of severe bleeding complication (e.g., major intracranial surgery), or develop significant overt bleeding, consider discontinuation of P2Y12 inhibitor therapy after 6 months.

Beta-Blocker Therapy in the Secondary Prevention of CAD

▸ For CAD patients, consider initiating non-intrinsic sympathomimetic activity (non-ISA) beta-blocker therapy unless contraindicated.

Peri-Operative Beta-Blockers for Non-Cardiac Surgery: Patients with CAD or Left Ventricular Systolic Dysfunction (LVSD)

*The following recommendations refer to patients with no contraindications to beta-blocker use.*
For patients with CAD who are undergoing non-cardiac surgery and currently taking beta-blockers, continue beta-blocker therapy in the peri-operative period.

For patients with CAD undergoing non-cardiac surgery and not currently taking beta-blockers, consider initiating beta-blockers at least 2 weeks before surgery in those with risk factors (myocardial ischemia or ≥ 3 Revised Cardiac Risk Index predictors: diabetes mellitus, heart failure, CAD, renal insufficiency, cerebrovascular accident).

In the absence of compelling indications for urgent beta-blocker therapy, consider avoiding the initiation of beta-blocker therapy between 2 weeks and 24 hours before surgery.

Do not initiate beta-blockers on the day of surgery.

* Contraindications and cautions: Beta-blockers are not recommended for patients with severe reversible airway disease, high-degree heart block, or other contraindications to their use. Initiating beta blockade should be approached with caution in patients with resting heart rates < 55.

### CAD plus Mild-to-Moderate Reversible Airway Disease or COPD

For CAD patients with concomitant mild-to-moderate reversible airway disease or chronic obstructive pulmonary disease (COPD), prescribe cardioselective beta-blockers.

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

Consider not initiating beta-blocker therapy for the following:
- For patients with CAD with severe airway disease requiring frequent hospitalization or intubation.
- For patients with CAD during acute exacerbation of airway disease.
- For patients with CAD when airway disease is unstable or poorly controlled.

### CAD plus Heart Failure

- For CAD patients with either LVSD (NYHA Class II-IV) or asymptomatic LVSD (NYHA Class I), prescribe beta-blockers.
- For CAD patients with LVSD, prescribe carvedilol, metoprolol succinate, or bisoprolol.

### Calcium Channel Blocker Therapy

#### CAD with Normal Ventricular Systolic Function

- Do not prescribe calcium channel blockers (CCBs) to reduce morbidity or mortality from CAD.
- In CAD patients with normal ventricular systolic function, consider using CCBs for the treatment of angina pectoris or hypertension when beta-blockers and ACEI are ineffective or contraindicated.
In patients with CAD, do not prescribe immediate-release formulations of nifedipine due to the increased risk of cardiovascular mortality.

**CAD with LVSD**

In patients with LVSD with uncontrolled hypertension despite beta-blocker, ACEI/ARB, spironolactone, hydralazine and long-acting nitrate, consider prescribing amlodipine* and felodipine* (second-generation dihydropyridine calcium channel blockers). For the treatment of angina pectoris in patients with LVSD with angina pectoris despite beta-blocker and long-acting nitrate, consider prescribing amlodipine* and felodipine* (second-generation dihydropyridine calcium channel blockers).

In patients with LVSD, do not prescribe CCBs other than amlodipine* and felodipine*.

*Not FDA-approved for heart failure.

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**Lifestyle Modification**

**Diet Therapy**

For all patients with CAD, recommend a diet rich in fruits, vegetables, legumes, nuts, whole grains, and n-3 (omega-3) polyunsaturated fatty acids.

**Dietary Fat Modification**

For all patients with CAD consuming a usual Western diet, consider recommending the following modifications in dietary fat:

- Increase intake of n-3 (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 Supplement Therapy**

For patients with CAD, do not prescribe supplemental vitamins C, E, or beta carotene for prevention of cardiovascular mortality or subsequent coronary events.

**Smoking Cessation**

For all patients with CAD who smoke, recommend complete smoking cessation.

**Exercise and Cardiac Rehabilitation**

For all patients with CAD, recommend 30 to 60 minutes of exercise (eg, brisk walking) at least five to seven times weekly.

Offer all patients with CAD referral to a comprehensive cardiovascular rehabilitation program.
Hormone Therapy

- For postmenopausal women with CAD, do not prescribe unopposed estrogen therapy or estrogen and progestin combination therapy for the prevention of cardiovascular events. Women taking these therapies solely to prevent cardiovascular events should discontinue these therapies.
- Women currently taking hormone therapy solely for the prevention of cardiovascular events should consider discontinuing use either all at once or by tapering the dose.

Comorbid Conditions

Hypertension: Target Blood Pressure

- In the general population aged ≥ 60 years, initiate pharmacologic treatment to lower blood pressure (BP) at systolic blood pressure (SBP) ≥ 150 mm Hg or diastolic blood pressure (DBP) ≥ 90 mm Hg and treat to a goal SBP < 150 mm Hg and goal DBP < 90 mm Hg.
- In the general population aged < 60 years, initiate pharmacologic treatment to lower BP at DBP ≥ 90 mm Hg and treat to a goal DBP < 90 mm Hg.
- In the general population aged < 60 years, initiate pharmacologic treatment to lower BP at SBP ≥ 140 mm Hg and treat to a goal SBP < 140 mm Hg.

*Please also reference your local guideline if in KPCO region

Lipid Therapy: Choice of Drug and Treatment Strategy

- In women and men aged ≤ 75 years who have clinical ASCVD, initiate statin therapy or continue as first-line therapy unless contraindicated.
- In individuals with clinical ASCVD in whom high-intensity statin therapy would otherwise be used, when high-intensity statin therapy is contraindicated or when characteristics predisposing to statin-associated adverse effects are present, initiate moderate-intensity statin therapy as the second option if tolerated.
- In individuals with clinical ASCVD aged > 75 years, consider evaluating the potential for ASCVD risk-reduction benefits, adverse effects, and drug-drug interactions and consider patient preferences when initiating a moderate- or high-intensity statin. Consider continuing statin therapy in those who are tolerating it.
### TERMINOLOGY

<table>
<thead>
<tr>
<th>Recommendation Language</th>
<th>Strength*</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Start, initiate, prescribe, treat, etc.</td>
<td>Strong affirmative</td>
<td>Provide the intervention. Most individuals should receive the intervention; only a small proportion will not want the intervention.</td>
</tr>
<tr>
<td>Consider starting, etc.</td>
<td>Weak affirmative</td>
<td>Assist each patient in making a management decision consistent with personal values and preferences. The majority of individuals in this situation will want the intervention, but many will not. Different choices will be appropriate for different patients.</td>
</tr>
<tr>
<td>Consider stopping, etc.</td>
<td>Weak negative</td>
<td>Assist each patient in making a management decision consistent with personal values and preferences. The majority of individuals in this situation will not want the intervention, but many will. Different choices will be appropriate for different patients.</td>
</tr>
<tr>
<td>Stop, do not start, etc.</td>
<td>Strong negative</td>
<td>Do not provide the intervention. Most individuals should not receive the intervention; only a small proportion will want the intervention.</td>
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</tbody>
</table>

*Refers to the extent to which one can be confident that the desirable effects of an intervention outweigh its undesirable effects.

### DISCLAIMER

This guideline is informational only. It is not intended or designed as a substitute for the reasonable exercise of independent clinical judgment by practitioners, considering each patient’s needs on an individual basis. Guideline recommendations apply to populations of patients. Clinical judgment is necessary to design treatment plans for individual patients.

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1. See the National Heart Failure Guideline for additional recommendations for patients with LVEF ≤ 40%.
2. See the National Hypertension Guideline for additional recommendations for patients with hypertension.
3. See the National Diabetes Guideline for additional recommendations for patients with diabetes.
4. See the KP National Aspirin recommendations.
5. Recommendations are for patients without active pathological bleeding.