Pharmacotherapy 1

Chronic Coronary Disease (CCD)

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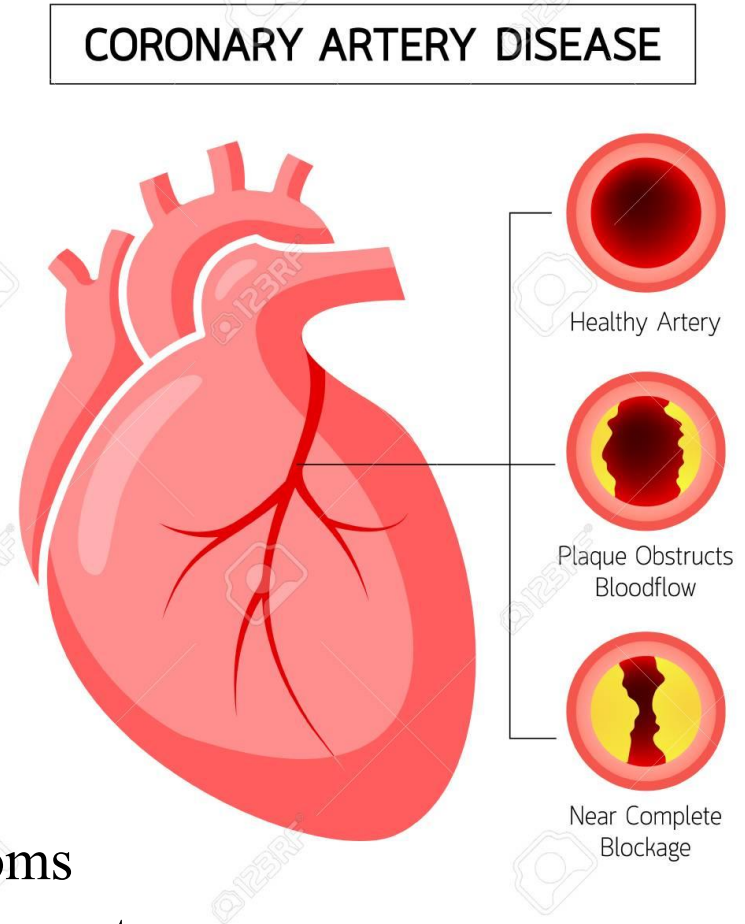
Topic outline:

- ✓ Definition
- ✓ Pathophysiology
- ✓ Risk Factors
- ✓ Diagnosis
- ✓ Treatment (goals, medications, secondary prevention, revascularization)
- ✓ Variable Threshold Angina
- ✓ Monitoring/Follow up

➢ Coronary Artery Disease (CAD) definition

- ✓ CAD refers to the luminal narrowing of a coronary artery, usually due to atherosclerosis.
- ✓ CAD is the leading contributor to IHD.
- ✓ IHD: angina pectoris, MI, and silent myocardial ischemia
- ✓ IHD: lack of oxygen & decreased or no blood flow to the myocardium (coronary artery narrowing or obstruction).
- ✓ Stable angina is: angina symptoms or angina equivalent symptoms that are reproduced by consistent levels of activity & relieved by rest.



➢ Pathophysiology

- ✓ Stable angina results from progressive luminal obstruction of epicardial coronary arteries (mismatch between myocardial oxygen supply and demand)

- ✓ Atherosclerosis is an inflammatory process, initiated by lipid deposition in the arterial intima layer followed by recruitment of inflammatory cells and proliferation of arterial smooth muscle cells to form an atheroma.

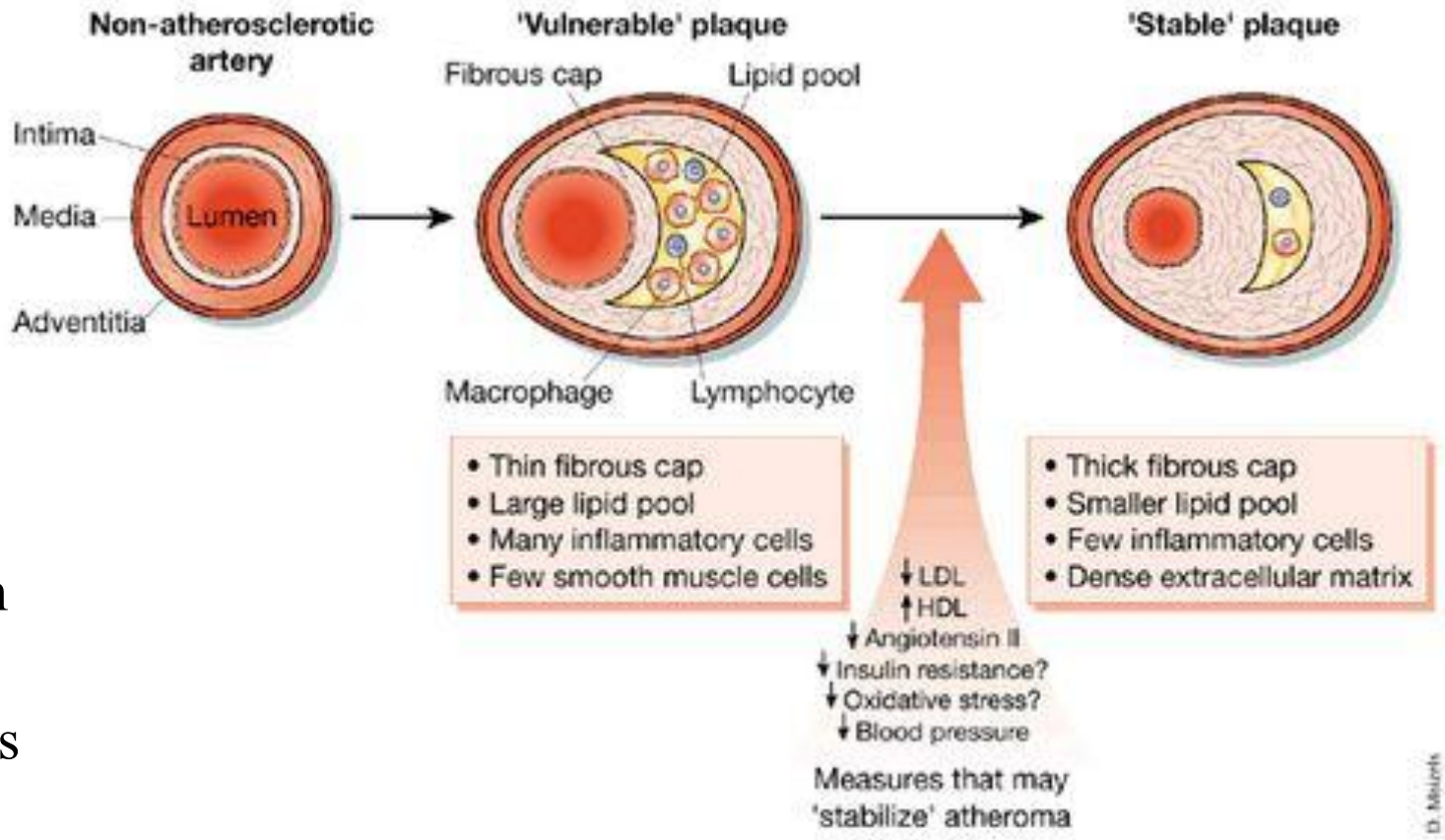


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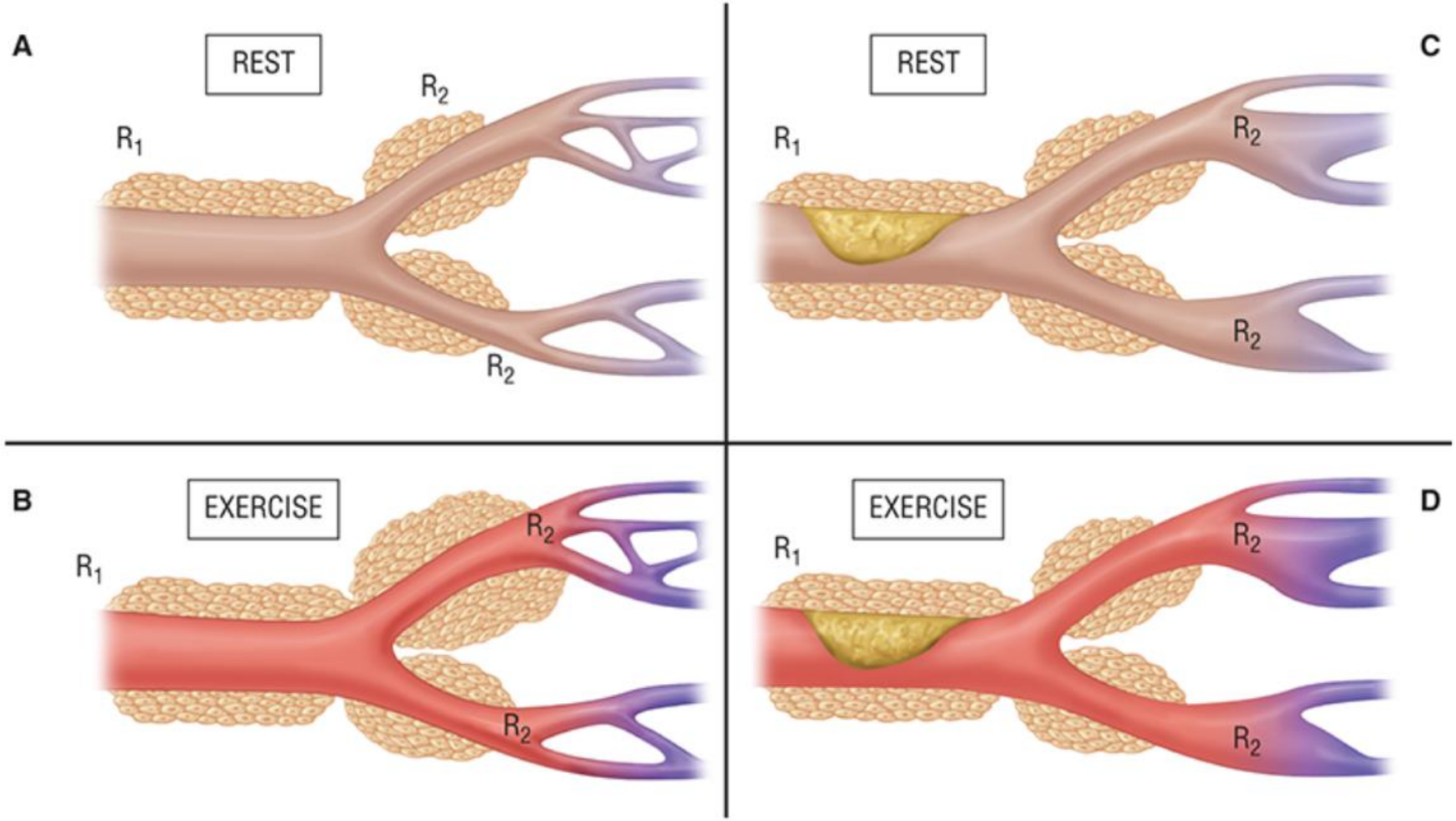
FIGURE 36-1 Coronary artery blood flow. *(Reproduced with permission from Epstein SE, O'Cannon R, Talbot TL. Hemodynamic principles in the control of coronary blood flow. Am J Cardiol 1985;56(9):4E-10E.)*



➢ Risk Factors

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✓ Assessment of traditional CVD risk factors includes:

- Age
- BP
- Blood sugar (note: diabetes is considered an IHD risk equivalent)
- Lipid profile (LDL, HDL, triglycerides)
- Tobacco use (smoking cessation restores the risk of IHD to that of a nonsmoker within ~15 yrs)
- Family history of premature CAD: first-degree male relative with IHD before age 55 or female relative before age 65.
- Measures for obesity, particularly central obesity; BMI goal 18.5-24.9 kg/ m^2; and waist circumference goal is < 40 inches for men and < 35 inches for women.

✓ Estimation of annual cardiovascular risk using a validated risk prediction model (eg, https://professional.heart.org/en/guidelines-and-statements/prevent-calculator).

➢ Diagnosis

Clinical Presentation

✓ History (quality & severity, precipitating factors, location, duration, pain radiation, & response to NTG or rest):

- Typical angina has three features:
  1. substernal chest discomfort (squeezing, crushing, heaviness, chest tightness, numbness, burning) lasts from 5-20 minutes with a characteristic quality and duration that is
  2. provoked by stress or exertion of daily living activites and
  3. relieved by rest or nitroglycerin.
- Atypical angina has two of these three characteristics.
- Noncardiac chest pain meets one or none of these characteristics.

✓ Chronic stable angina is reproducibly precipitated in a predictable manner by exertion or emotional stress and relieved within 5– 10 minutes by SL NTG or rest.

- ✓ The severity of angina may be quantified using the Canadian Cardiovascular Society (CCS) classification system.
- ✓ Associated symptoms may include dyspnea, diaphoresis, nausea, vomiting, dizziness, jaw pain, and left arm pain.
- ✓ Female patients and those with diabetes or CKD may have minimal or atypical symptoms that serve as anginal equivalents (dyspnea [most common], epigastric pain/discomfort, nausea, effort intolerance, and excessive fatigue).
- ✓ Patients with DM may have decreased pain sensation due to neuropathy.
- ✓ Physical examination, diagnostic testing (ECG, chest radiography, transthoracic echocardiogram, stress testing)

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CLINICAL PRESENTATION: Chronic Coronary Disease (CCD)

General

- The patient is not typically in acute distress; however, careful assessment to identify features consistent with ACS is important.

Symptoms

- The classic symptom of CCD is substernal chest pain or discomfort often described as a squeezing, heaviness, or tightness (Table 36-1). Symptoms may radiate to the arms, shoulders, back, abdomen, or jaw. Nausea, vomiting, diaphoresis, or shortness of breath may also be present.
- The PQRST pneumonic (Table 36-2) is useful for structuring the patient interview to assess the history of chest pain.
- Evaluation of symptoms should include an evaluation of the limitations in daily activities due to angina (eg, Canadian Cardiovascular Society [CCS] classification system, Seattle Angina Questionnaire, see Table 36-3).

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Signs

- BP or HR may be elevated in patients with CCD
- No physical findings are specific for CCD.
- Patients with CCD may present with signs of HF, including jugular venous distention, pulmonary edema, and an S_3 on auscultation.

Laboratory Tests

- High-sensitivity cardiac troponin (hs-cTn) is not typically elevated in patients with CCD.
- A fasting lipid panel should be evaluated to assess for the presence of dyslipidemia.
- Blood chemistry tests (eg, potassium [K+], serum creatinine [SCr]), liver function tests, and blood glucose should be evaluated to assess for the presence of CCD risk factors (eg, diabetes), risk for adverse drug events, and/or the need for dosage adjustments.
- Complete blood count (eg, hemoglobin [Hgb], platelets) to determine risk of adverse drug events.

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Other Diagnostic Tests

- A 12-lead ECG should be obtained in a patient with new or worsening symptoms of CCD. However, it is often normal in patients with CCD.
- Exercise stress testing is a noninvasive test to detect CAD in patients presenting with symptoms of CCD.
- To detect the presence and extent of CAD, coronary angiography may be performed in patients with a high likelihood of CCD (eg, “positive” exercise stress test) to detect the presence and extent of CAD.
- Other diagnostic tests may be used in select patients to detect CAD or assess for progression of disease and include positron emission tomography/single photon emission computed tomography myocardial perfusion imaging, cardiac magnetic resonance imaging, coronary computed tomography (CT), and coronary CT angiography.

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TABLE 36-1

Differential Diagnosis of Episodic Chest Pain Resembling Angina Pectoris

	Duration	Quality	Provocation	Relief	Location	Comment
Effort angina	5-15 minutes	Visceral (pressure)	During effort or emotion	Rest, nitroglycerin	Substernal, radiates	First episode vivid
Rest angina	5-15 minutes	Visceral (pressure)	Spontaneous	Nitroglycerin	Substernal, radiates	Often nocturnal
Mitral valve prolapse	Minutes to hours	Superficial (rarely visceral)	Spontaneous (no pattern)	Time	Left anterior	No pattern, variable
Esophageal reflux	10 minutes to 1 hour	Visceral	Spontaneous, cold liquids, exercise, lying down	Foods, antacids, H_2 blockers, proton pump inhibitors, nitroglycerin	Substernal, radiates	Mimics angina
Peptic ulcer	Hours	Visceral, burning	Lack of food, "acid" foods	Foods, antacids, H_2 blockers, proton pump inhibitors	Epigastric, substernal	
Biliary disease	Hours	Visceral (wax and wane)	Spontaneous, food	Time, analgesia	Epigastric, radiates	Colic
Cervical spine disorders	Variable (gradually subsides)	Superficial	Spontaneous, food	Time, analgesia	Arm, neck	Not relieved by rest
Hyperventilation	2-3 minutes	Visceral	Emotion, tachypnea	Stimulus removed	Substernal	Facial paresthesia
Musculoskeletal	Variable	Superficial	Movement, palpation	Time, analgesia	Multiple	Tenderness
Pulmonary	Minutes to hours	Visceral (pressure)	Often spontaneous	Rest, time bronchodilator	Substernal	Dyspneic

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TABLE 36-2

PQRST Approach to Assessment of a Patient's Chest Pain

Factor	Presentation in Chronic Coronary Disease	Questions to Ask
Precipitating factors	Typically brought on by some level of exercise or exertion	What were you doing when the pain started? What brought on this chest pain?
Palliative measures	Relieved by rest with or without sublingual nitroglycerin in 5-10 minutes	Is there anything that helps the pain go away? If you rest, does the pain get better? Does your sublingual nitroglycerin help?
Quality of the pain	Described as a continuous squeezing, heaviness, or tightness	How would you describe the pain? Does the pain change when you breathe in and out?
Region	Substernal	Where is the pain located? Can you point to where the pain seems to originate?
Radiation	Left or right arm, back, down into the abdomen, up into the neck	Does the pain seem to radiate or go to other locations?
Severity	While pain is subjective, those who have pain report a 5 or higher on a 10-point scale	On a scale from 1 to 10, with 1 being no pain, and 10 being the worst pain you have ever had, how would you rate this pain?
Temporal pattern (timing)	Pain lasts less than 20 minutes and is usually relieved in 5-10 minutes	How long did the pain last? How long before the pain went away? After you started to rest, how long before the pain went away?

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TABLE 36-3 Grading of Angina Pectoris by the Canadian Cardiovascular Society Classification System

Reproduced with permission from Campeau L. Grading of angina pectoris. Circulation 1976;54(3):522-3.

Canadian Cardiovascular Society Classification System		Seattle Angina Questionnaire-7	
Class I	Ordinary physical activity does not cause angina, such as walking and climbing stairs. Angina occurs with strenuous, rapid, or prolonged exertion at work or recreation.	Activity	•Indicate how much limitation you have had due to chest pain, chest tightness, or angina over the past 4 weeks (Likert scale for each question below) • Walking indoors on level ground • Gardening, vacuuming or carrying groceries • Lifting or moving heavy objects (eg, furniture, children)
Class II	Slight limitation or ordinary activity. Angina occurs on walking or climbing stairs rapidly, on an incline, after meals, in the cold, or into the wind. Angina may occur under emotional stress or only during the few hours after awakening. Walking more than two blocks on the level and climbing more than one flight of ordinary stairs at a normal pace and in normal condition may also precipitate angina.	Symptoms	•Over the past 4 weeks, on average, how many times have you had chest pain, chest tightness, or angina? • 4 or more times/day • 1-3 times/day • 3 or more times/week, but not every day • 1-2 times/week • Less than once/week • None over the past 4 weeks

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TABLE 36-3 Grading of Angina Pectoris by the Canadian Cardiovascular Society Classification System

Reproduced with permission from Campeau L. Grading of angina pectoris. Circulation 1976;54(3):522-3.

Canadian Cardiovascular Society Classification System		Seattle Angina Questionnaire-7	
Class III	Marked limitations of ordinary physical activity. Angina occurs on walking one to two blocks on the level or climbing one flight of stairs in normal conditions and at a normal pace may precipitate angina.	NTG use	•Over the past 4 weeks, on average, how many times have you had to take nitroglycerin (nitroglycerin tablets or spray) for your chest pain, chest tightness, or angina? • 4 or more times/day • 1-3 times/day • 3 or more times/week, but not every day • 1-2 times/week • Less than once/week • None over the past 4 weeks
Class IV	Inability to carry on any physical activity without discomfort - anginal symptoms may be present at rest.	Quality of life	(Likert scale for each question below) •Over the past 4 weeks, how much has your chest pain, chest tightness, or angina limited your enjoyment of life? •If you had to spend the rest of your life with your chest pain, chest tightness, or angina the way it is right now, how would you feel about this?

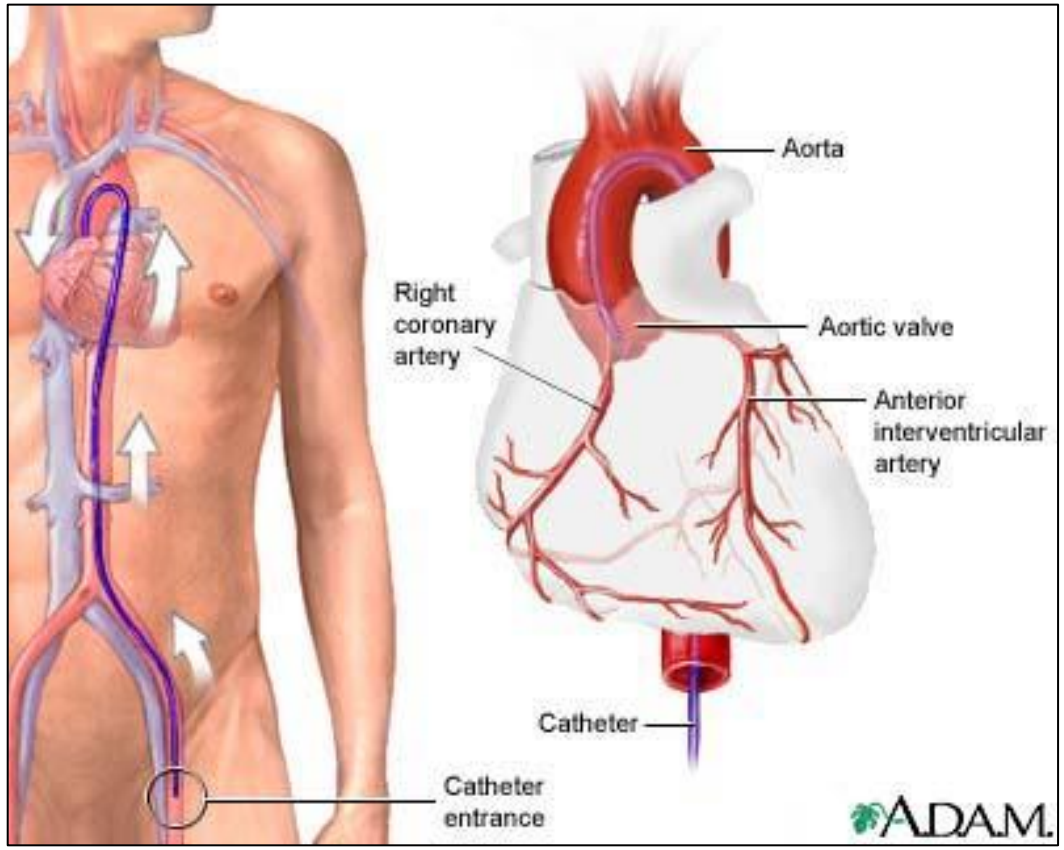
TABLE 32-3 Grading of Angina Pectoris by the Canadian Cardiovascular Society Classification System[17]

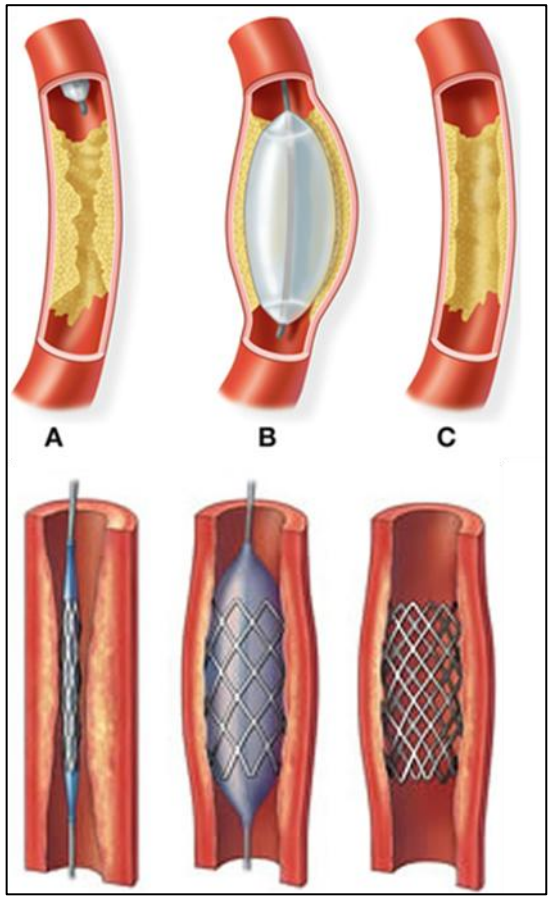
Class	Description of Stage
Class I	Ordinary physical activity does not cause angina, such as walking and climbing stairs. Angina occurs with strenuous, rapid, or prolonged exertion at work or recreation
Class II	Slight limitation or ordinary activity. Angina occurs on walking or climbing stairs rapidly, on walking uphill, on walking or stair climbing after meals, in cold, in wind, under emotional stress, or only during the few hours after awakening. Walking more than two blocks on the level and climbing more than one flight of ordinary stairs at a normal pace and in normal condition
Class III	Marked limitations of ordinary physical activity. Angina occurs on walking one to two blocks on the level and climbing one flight of stairs in normal conditions and at a normal pace
Class IV	Inability to carry on any physical activity without discomfort—anginal symptoms may be present at rest

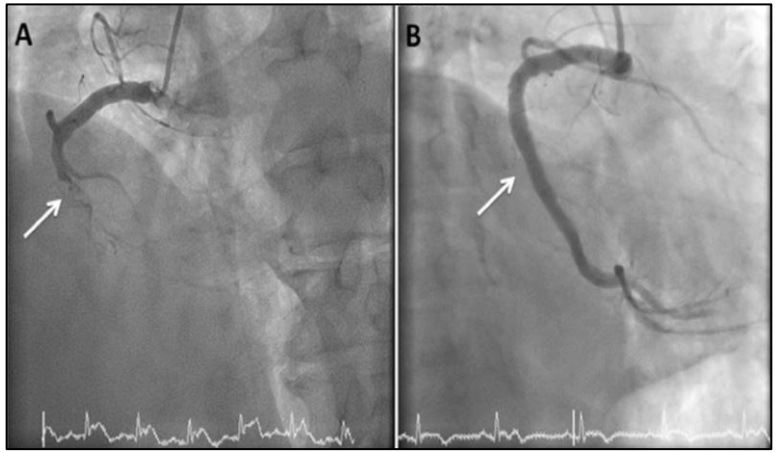
Source: Reproduced, with permission, from Campeau L. Grading of angina pectoris. Circulation 1976;54:522-523.

✓ Diagnostic Procedures: Coronary angiography

- The gold standard for evaluating epicardial coronary anatomy because it quantifies the presence and severity of atherosclerotic lesions, which has prognostic value.
- Whether PCI in stable IHD improves CV outcomes or symptoms compared to medical therapy is controversial.







➢ Treatment

- ✓ The major goal of treatment is to reduce symptoms.
- ✓ Long-term goals: slow progression of atherosclerosis & prevent complications as MI, HF, stroke, and death.
- ✓ A combination of lifestyle modification, medical therapy, & coronary revascularization can be used.
- ✓ Risk factor modification is the primary nondrug approach for primary & secondary prevention of CAD events.
- ✓ Lifestyle modifications: daily physical activity, weight management, dietary therapy (reduced intake of saturated fats to <7% of total calories, trans-fatty acids to <1% of total calories, and cholesterol to <200 mg/day), smoking cessation, psychological interventions, and limitation of alcohol intake.
- ✓ Medical treatment is aimed at improving myocardial oxygen supply, reducing myocardial oxygen demand, controlling exacerbating factors (e.g., anemia), and limiting the development of further atherosclerotic disease.

Clinicians should approach smoking cessation by using the 6 A's framework:

1. Ask each patient about tobacco use at every visit
2. Advise each smoker to quit
3. Assess each smoker's willingness to make a quit attempt
4. Assist each smoker in making a quit attempt by offering medication and referral for counselling
5. Arrange for follow-up
6. Avoid exposure to environmental tobacco smoke

Treatment algorithm for stable ischemic heart disease

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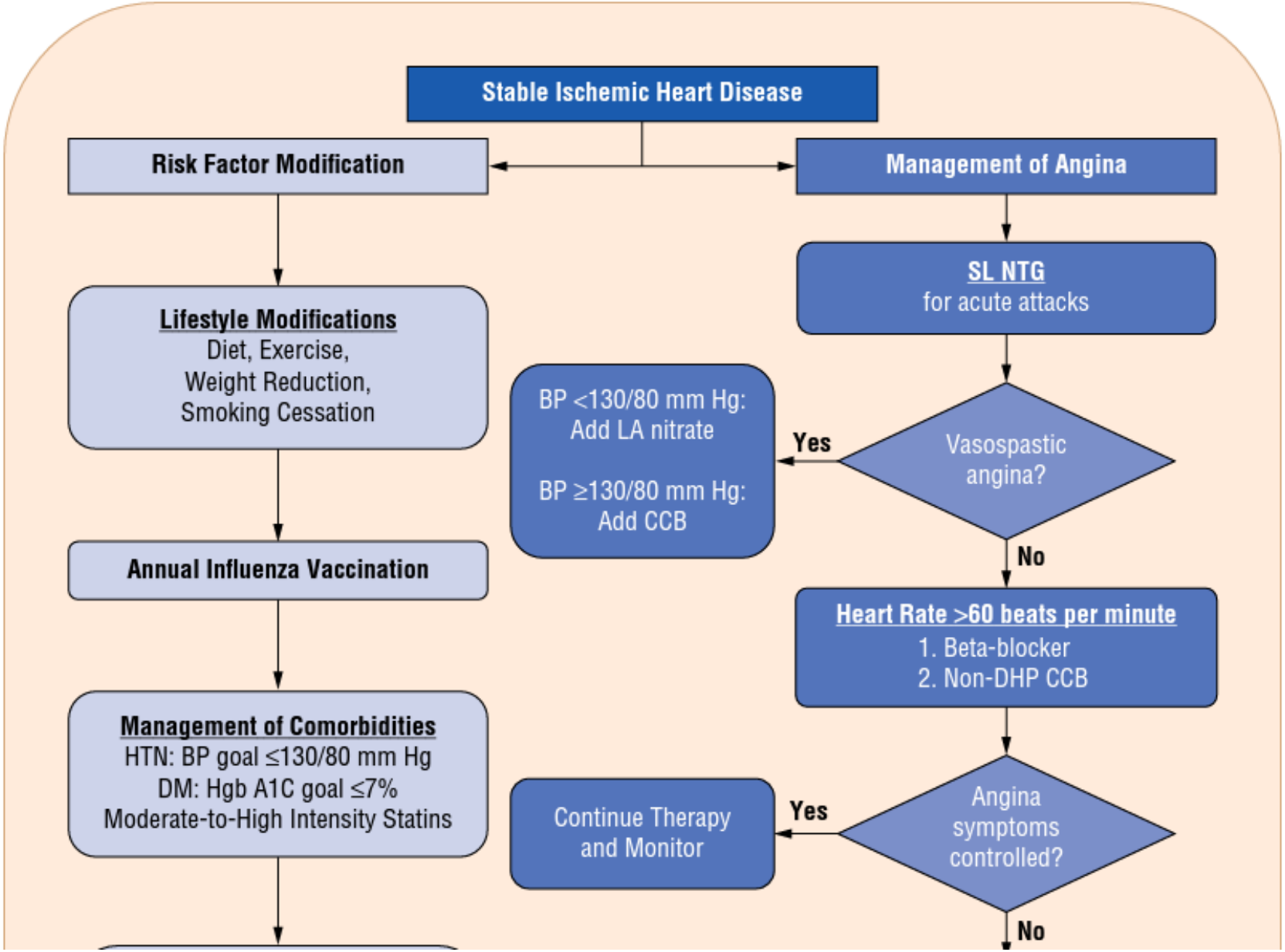

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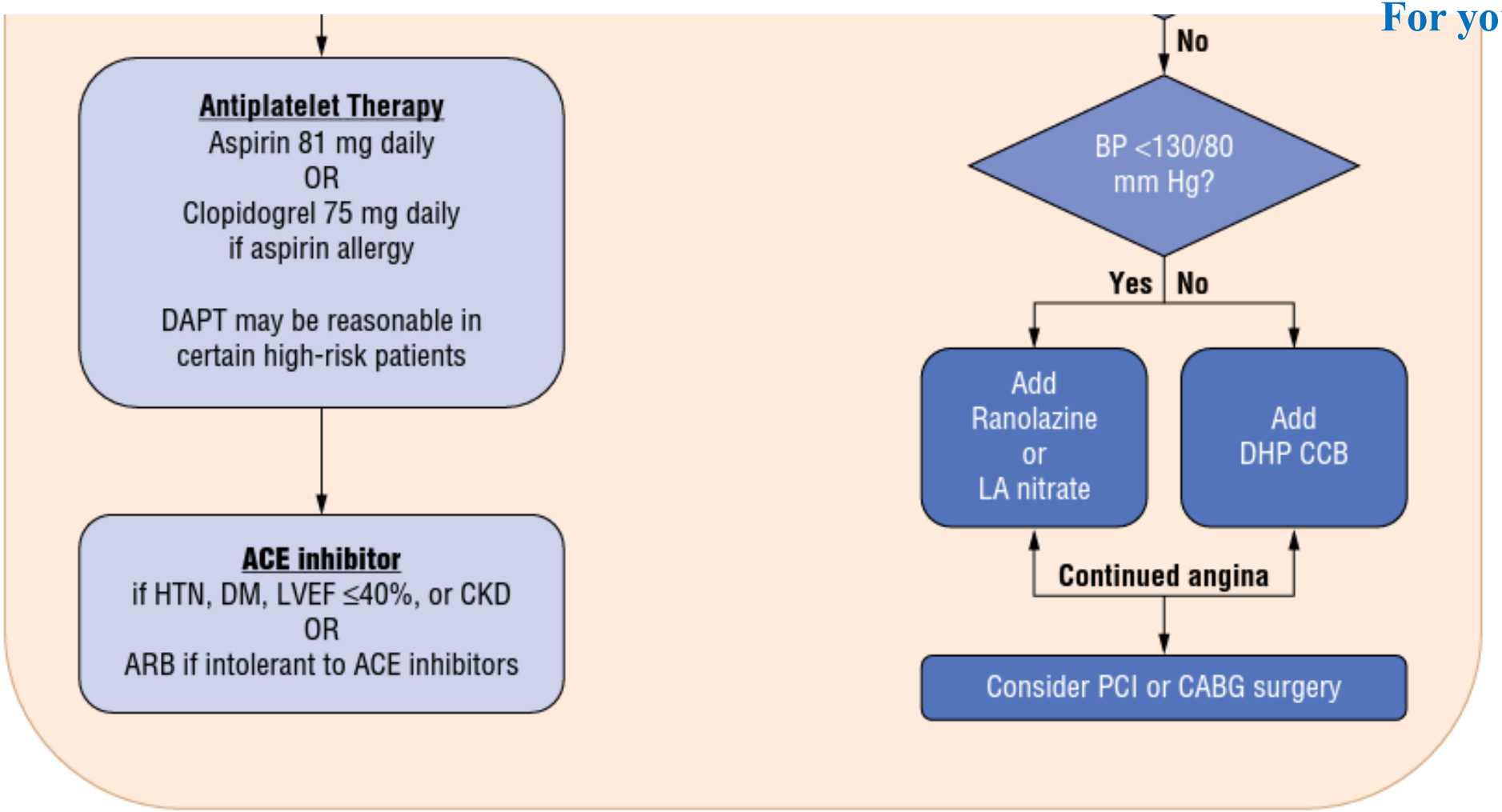

Treatment algorithm for stable ischemic heart disease

(guideline-directed medical therapy).

(DAPT, dual antiplatelet therapy)

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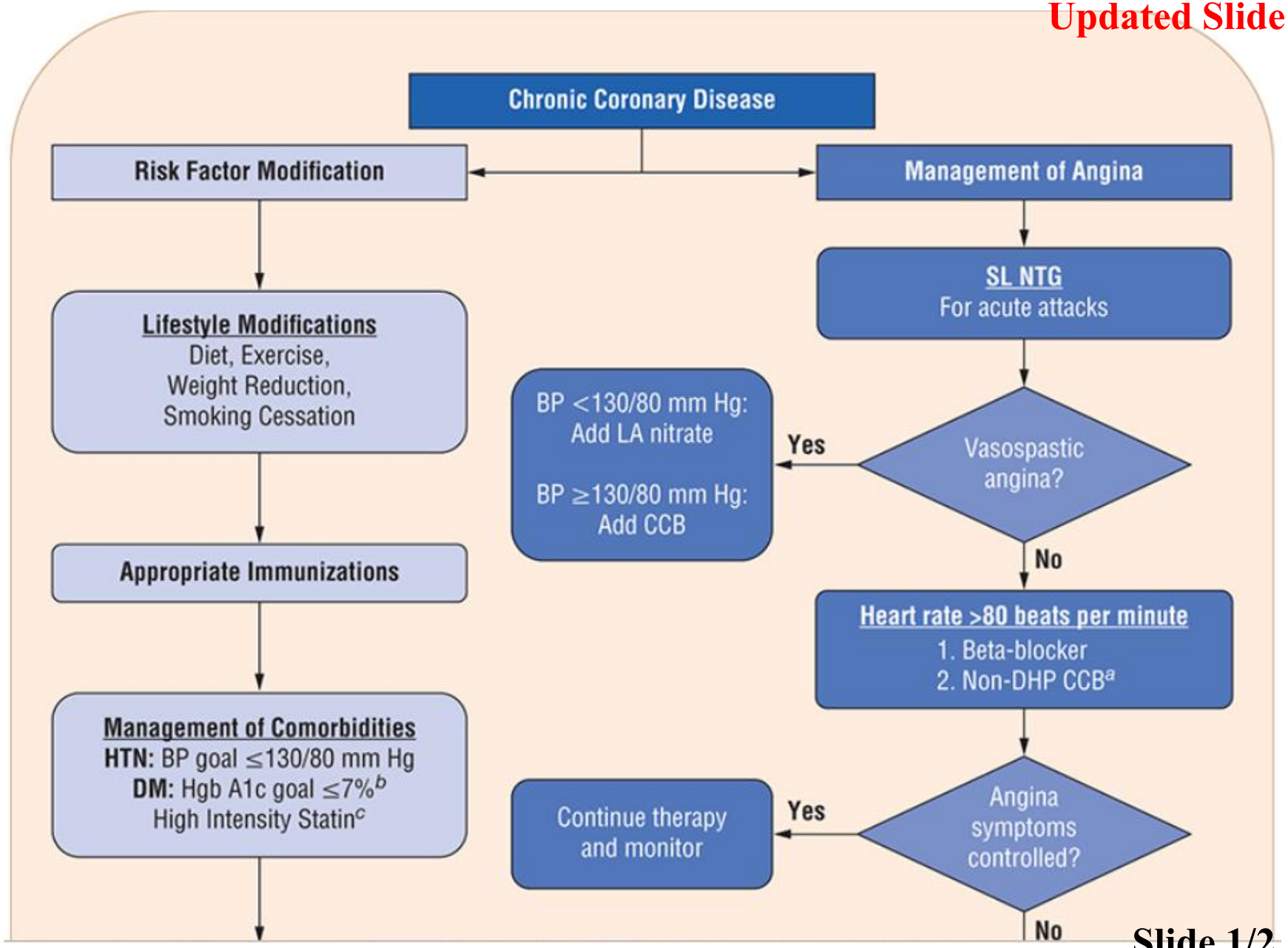
FIGURE 36-2 Treatment algorithm for chronic coronary disease (guideline-directed medical therapy).

(ACE, angiotensin-converting enzyme; ARB, angiotensin receptor blocker; CCB, calcium channel blocker; CKD, chronic kidney disease; DAPT, dual antiplatelet therapy; DHP, dihydropyridine; LA, long-acting; LVEF, left ventricular ejection fraction.)

a Avoid in patients with significant left ventricular dysfunction (eg, LVEF ≤40%).

b Use of a sodium-glucose cotransporter 2 inhibitor or glucagon-like peptide agonist is recommended. The Hgb A1c goal of ≤7% (0.07) is equivalent to 53 mmol/mol.

c Moderate intensity statin is recommended for patients with a contraindication or intolerance to high-intensity statins.



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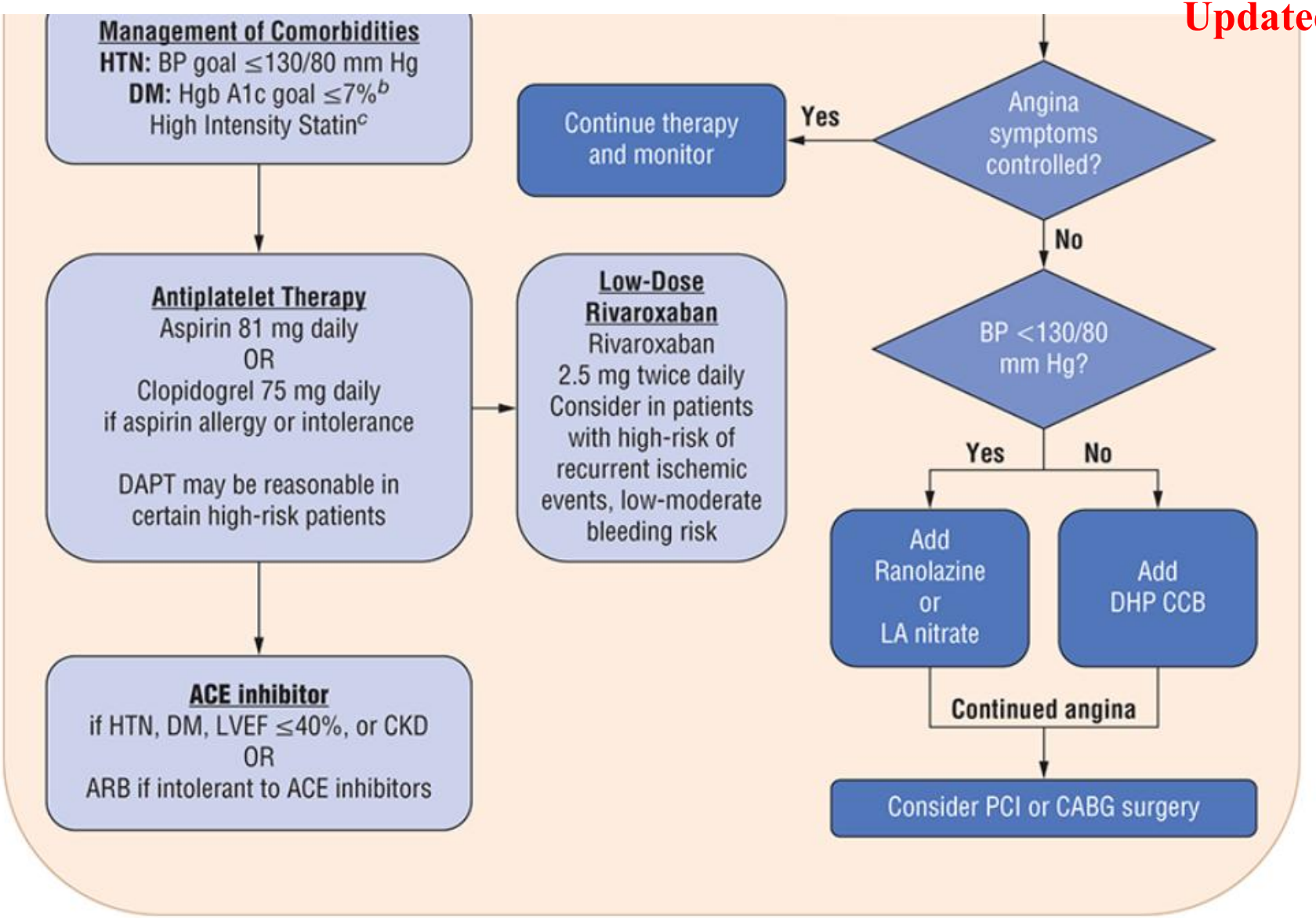

Source: Stuart T. Haines, Thomas D. Nolin, Vicki L. Ellingrod, Lisa M. Holle, Jennifer Cocohoba, L. Michael Posey: *DiPiro's Pharmacotherapy: A Pathophysiologic Approach, 13th Edition*

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Medications

Anti-ischemic therapy

β-Adrenergic antagonists

- ✓ control anginal symptoms by decreasing HR and myocardial work, leading to reduced myocardial oxygen demand.
- ✓ Dosage can be adjusted to result in optimizing HR for symptom relief.
- ✓ Use with caution or avoid in patients with active bronchospasm, AV block, resting bradycardia, or poorly compensated HF.
- ✓ Beta blockers are particularly effective in patients with CCD, **especially those** with recent MI and those with ongoing angina, given their ability to reduce angina, improve angina-free exercise tolerance, reduce exertion-related myocardial ischemia, and reduce risk of CVD events.
- ✓ Because of the significant benefits from beta blockers and ACE inhibitors and ARB agents in patients with CCD, these medications are recommended as a **first-line therapy in the treatment of hypertension in such individuals**.
- ✓ GDMT beta blockers for CCD and for lowering BP include **carvedilol, metoprolol tartrate, metoprolol succinate, nadolol, bisoprolol, propranolol, and timolol**.

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Recommendations for Beta Blockers
Referenced studies that support the recommendations are summarized in the Online Data Supplement.

COR	LOE	Recommendations
1	A	1. In patients with CCD and LVEF ≤40% with or without previous MI, the use of beta-blocker therapy is recommended to reduce the risk of future MACE, including cardiovascular death.[1–3]
1	A	2. In patients with CCD and LVEF <50%, the use of sustained release metoprolol succinate, carvedilol, or bisoprolol with titration to target doses is recommended in preference to other beta blockers.*[1,3–8]
2b	B-NR	3. In patients with CCD who were initiated on beta-blocker therapy for previous MI without a history of or current LVEF ≤50%, angina, arrhythmias, or uncontrolled hypertension, it may be reasonable to reassess the indication for long-term (>1 year) use of beta-blocker therapy for reducing MACE.[9–15]
3: No Benefit	B-NR	4. In patients with CCD without previous MI or LVEF ≤50%, the use of beta-blocker therapy is not beneficial in reducing MACE, in the absence of another primary indication for beta-blocker therapy.†[16–19]

*Modified from the 2022 AHA/ACC/HFSA Guideline for the Management of Heart Failure.[20]

†Adapted from the 2021 ACC/AHA/SCAI Guideline for Coronary Artery Revascularization.[21]

Ref: 2023 AHA/ACC/ACCP/ASPC/NLA/PCNA Guideline for the Management of Patients With Chronic Coronary Disease: A Report of the American Heart Association/American College of Cardiology Joint Committee on Clinical Practice Guidelines.
https://www.ahajournals.org/doi/10.1161/CIR.0000000000001168

Calcium channel blockers

- ✓ can be used either in conjunction with or in lieu of β-blockers in the presence of contraindications or adverse effects as a second-line agent.
- ✓ Both long-acting dihydropyridines and nondihydropyridine agents can be used.
- ✓ CCBs are effective agents for the treatment of coronary vasospasm.
- ✓ Nondihydropyridine agents (verapamil/ diltiazem) should be avoided in patients with systolic dysfunction because of their negative inotropic effects.

Nitrates

- ✓ either long-acting formulations for chronic use or SL/ topical preparations for acute anginal symptoms, are more often used as adjunctive antianginal agents (Table).
- ✓ SL preparations should be used at the first indication of angina or prophylactically before engaging in activities that are known to precipitate angina.
- ✓ Patients should seek prompt medical attention if angina occurs at rest or fails to respond to the SL dose.
- ✓ Nitrate tolerance resulting in reduced therapeutic response may occur with all nitrate preparations.
- ✓ The institution of a nitrate-free period of 10– 12 hours (usually at night) can enhance treatment efficacy.
- ✓ For patients with CAD, nitrates have not shown a mortality benefit.

- ✓ Nitrates are contraindicated (even in patients with ACS) for use in patients who are on phoshodiesterase-5 inhibitors due to risk of severe hypotension. A washout period of 24 hours for sildenafil and vardenafil and 48 hours for tadalafil is required before nitrate use.

Ranolazine

- ✓ It is indicated for angina refractory to standard medical therapy and has shown benefit in improving symptoms and quality of life.
- ✓ The initial ranolazine dose is 500 mg twice daily, increased to 1000 mg twice daily within the next 1 to 2 weeks if tolerated.
- ✓ Adverse effects include constipation, nausea, dizziness, and headache.
- ✓ Ranolazine can prolong the QTc interval.
- ✓ Potent inhibitors of CYP3A4 and P-glycoprotein (ketoconazole, itraconazole, protease inhibitors, clarithromycin, and nefazodone) or potent inducers (phenytoin, phenobarbital, carbamazepine, rifampin, rifabutin, rifapentine, St. John's wort) are contraindicated with ranolazine.

TABLE 32-7 Nitrate Products

Product	Onset (minutes)	Duration	Initial Dose
Nitroglycerin			
IV	1-2	3-5 minutes	5 mcg/min
Sublingual/lingual	1-3	30-60 minutes	0.3-0.4 mg
Oral	40	3-6 hours	2.5-9 mg three times a day
Ointment	20-60	2-8 hours	0.5-1 in.
Patch	40-60	>8 hours	1 patch
Isosorbide dinitrate			
Sublingual/chewable	2-5	1-2 hours	2.5-5 mg three times a day
Oral	20-40	4-6 hours	5-20 mg three times a day
Isosorbide mononitrate			
Immediate-release	30-60	6-8 hours	20 mg twice a day
Extended-release	30-60	12-24 hours	30-60 mg daily

TABLE 32-8 Appropriate Use of Sublingual Nitroglycerin

Education Point	Rationale
Keep in original dark glass container	SL NTG will interact with plastic and can lose potency when exposed to light. This is why it is packaged in a dark glass container.
Do not store in a larger plastic vial with child-resistant safety cap	During an episode of angina, you do not want the patient struggling to figure out how to open the safety cap.
Do not store in the bathroom	SL NTG will degrade in moisture and tablets will lose their integrity and potency.
Keep SL NTG close by at all times; may need multiple vials	SL NTG does not do the patient any good if they do not have it with them at the time of an episode of angina. The patient should consider having one at home, at work, in garage, etc.
The patient should be sitting down and rest while taking tablet	While the SL NTG tablets are small, the dose is not. It is likely the patient will have some flushing, may get a headache, and even become a little light-headed. They need to know this can happen.

Describe how to use a sublingual tablet	The SL NTG is administered under the tongue in order to provide rapid absorption and avoid first-pass metabolism. The patient needs to keep the tablet under the tongue until dissolved. Avoid swallowing the tablet.
Once opened, tablets need to be refilled every 6 months and spray every 3 years	Due to the instability of SL NTG tablets, they are typically only good for 6 months after the bottle is opened.[a] Shelf-life of the spray is longer. Patients need to be advised to refill SL NTG even if all doses have not been taken.
Remove the cotton plug from the bottle	Larger quantity bottles commonly have a cotton plug. During an episode of angina, you do not want the patient to be struggling with trying to get the cotton plug out of the bottle.
May be taken in advance of events known to cause chest pain	SL NTG can be used to prevent episodes of angina if taken before partaking in an exertional event known to precipitate angina/chest discomfort.
Contact 911 if first SL NTG does not relieve angina[b]	Most episodes of angina are relieved within 5-10 minutes of rest and a single SL NTG. If pain persists, the episode may be an acute coronary syndrome, not stable ischemic heart disease. This requires rapid medical attention.

a Product specific.

b May be patient specific base on their known experience with SL NTG and angina episodes

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TABLE 36-4 Select Recommendations for Risk Factor Modification (4 slides)

Lipid Management[a]
Class 1
1. High-intensity statin therapy is recommended with a goal of achieving a ≥50% decrease in LDL-C to reduce the risk of MACE. 2. In patients with contraindications or intolerant to high-intensity statin therapy, moderate-intensity statins should be used, if tolerated, with a goal of achieving a 30%-49% decrease in LDL-C to reduce the risk of MACE. 3. Fasting lipid panels should be measured in 4-12 weeks after statin initiation or dose adjustment to assess adherence to lifestyle changes and the effects of lipid-lowering medications. Fasting lipids should be measured every 3-12 months thereafter based on need to assess response/adherence to therapy.
Class 2a
1. In patients older than 75 years, moderate- or high-intensity statin therapy should be used after considering the potential benefits (risk reduction) and risks (adverse drug reactions, drug-drug interactions, patient frailty). 2. For patients with an LDL-C >70 mg/dL (1.81 mmol/L) on maximally tolerated statin therapy and at very high risk for CV events, the addition of ezetimibe is reasonable. 3. For patients with an LDL-C >70 mg/dL (1.81 mmol/L) or a non-HDL-C level ≥100 mg/dL (2.59 mmol/L) on maximally tolerated LDL-C lowering therapy (statin plus ezetimibe) and at very high risk for CV events, the addition of a PCSK-9 inhibitor is reasonable depending on benefit, risk, cost, and patient preference.
Class 3
1. The use of adding niacin, fenofibrate, or dietary supplements containing omega-3 fatty acids to patients receiving statin, is not beneficial in reducing CV risk.
Blood Pressure Management[b]
Class 1
1. Nonpharmacologic strategies are first-line therapy to lower BP in those with an elevated BL (120-129/<80 mm Hg). 2. In patients with HTN, a BP target of <130/80 mm Hg is recommended to reduce CVD events and all-cause death. 3. In patients with HTN, the use of nonpharmacologic strategies and GDMT (eg, ACE inhibitors, ARBs, or β-blockers) are recommended first-line for compelling indications (eg, recent MI or angina). 4. Additional antihypertensive medications (eg, long-acting thiazide diuretics, dihydropyridine calcium channel blockers, or aldosterone antagonists) are recommended as needed to optimize BP control.
Class 2a
1. For patients who have had an ACS, it is reasonable to continue β-blockers long term if needed for treatment of HTN.

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Diabetes Management[c]
Class 1
1. Among patients with type 2 DM the use of either a sodium-glucose-cotransporter 2 (SGLT2) inhibitor or glucagon-like peptide-1 (GLP-1) receptor agonist with proven CV benefit is recommended as part of the glucose-lowering regimen independent of A1c, metformin use, and in consideration of patient-specific factors to reduce the risk of MACE. 2. In patients with CCD and HF with LVEF ≤40% (0.4), the use of an SGLT2 inhibitor is recommended to reduce the risk of CV death and HF hospitalization and to improve QOL, irrespective of diabetes status. 3. The ADA recommends a hemoglobin A1c goal <7% (53 mmol/mol) in patients with CCD and type 2 diabetes with a more conservative glycemic target of <8-8.5% (64-69 mmol/mol) in those >65 years of age or with multiple comorbidities.
Class 2a
1. For selected individual patients, such as those with a short duration of DM and a long life expectancy, a goal A1c of 7% (53 mmol/mol) or less is reasonable. 2. A goal A1c <8% (64 mmol/mol) is reasonable for certain patients according to age, history of hypoglycemia, the presence of microvascular or macrovascular complications, or presence of coexisting medical conditions.
Influenza Vaccinations[d]
Class 1
1. Annual influenza vaccination is recommended to reduce CV morbidity, CV death, and all-cause death. 2. Coronavirus disease 2019 (COVID-19) vaccination is recommended per published health guidelines to reduce COVID-19 complications.
Class 2a
1. Pneumococcal vaccine is reasonable to reduce CV morbidity and mortality, and all-cause death.
Physical Activity[d]
Class 1
1. For patient without contraindications, an exercise regimen including ≥150 min/wk of moderate-intensity or ≥75 min/wk of higher-intensity aerobic activity to improve functional capacity and QOL, and reduce hospital admission and mortality. 2. For patient without contraindications, resistance/strength training exercises are recommended ≥2 days/wk to improve muscle strength, functional capacity, and improve CV risk factors.
Class 2a
1. It is reasonable for the clinician to recommend complementary resistance training at least 2 days/wk.
Nutrition[d]
Class 1
1. A diet focused on vegetables, fruits, legumes, nuts, whole grains, and lean protein is recommended to reduce CVD events
Class 3
1. The intake of trans fat should be avoided as it is associated with increased morbidity and mortality. 2. The use of nonprescription or dietary supplements (including omega-3 fatty acid, vitamins C, D, E, beta-carotene, and calcium) is not beneficial to reduce the risk of CVD events.

New Slide

Weight Management[d]
Class 1
1. BMI with or without waist circumference should be assessed at every visit. 2. Patients with CCD with overweight or obesity (BMI 25-29.9 kg/m^2; waist circumference of 102 cm [40 in.] in men and less than 88 cm [35 in.] in women) should receive counseling on diet, lifestyle, and goals for weight loss: ○ Prevent further weight gain ○ Reduce body weight ○ Maintain a lower body weight over the long term 3. The initial goal of weight loss therapy should be to reduce body weight by approximately 5%-10% from baseline. With success, further weight loss can be attempted if indicated.
Class 2a
1. The use of a GLP-1 receptor agonist (reasonable to choose semaglutide over liraglutide) can be beneficial combined with counseling for diet and physical activity. 2. In patients with severe obesity who have not met weight loss goals with lifestyle and pharmacologic interventions, referral for bariatric surgery is reasonable for weight loss and CV risk factor reduction.
Class 3
1. The use of sympathomimetic drugs (eg, phentermine, diethylpropion, benzphetamine, phendimetrazine) is potentially harmful as they can increase HR and BP.
Smoking Cessation Counseling[d]
Class 1
1. Tobacco use should be assessed at every healthcare visit to identify those who may benefit from behavioral or pharmacologic interventions. 2. Patients who smoke tobacco should be advised to quit at every visit. 3. Patients who smoke tobacco should receive behavioral interventions in combination with pharmacotherapy, including bupropion, varenicline, or combination NRT.
Class 3
1. Patients with CCD should avoid secondhand smoke exposure to reduce risk of CV events.
Alcohol and Substance Use[d]
Class 1
1. Patients should be asked regularly and counseled about substance use to reduce ASCVD events.
Class 2a
1. Patients who consume alcohol should limit intake to ≤1 drink/day for women and ≤2 drinks/day for men to reduce CV and all-cause death. One drink is equal to 5 ounces (~150 mL) of wine, 12 ounces (355 mL) of beer, or 1.5 ounce (45 mL) of spirits.

New Slide

ACE, angiotensin converting enzyme; ADA, American Diabetes Association; ARB, angiotensin receptor blocker; CV, cardiovascular; CVD, cardiovascular disease; GDMT, guideline-directed medical therapy; HF, heart failure; HFrEF, heart failure with reduced ejection fraction; LVEF, left ventricular ejection fraction; MACE, major adverse cardiovascular events; NRT, nicotine replacement therapy; QOL, quality of life.

In brief, **Class 1** recommendation refers to conditions for which there is evidence or general agreement that a given procedure or treatment is useful and effective. **Class 2** refers to conditions with conflicting evidence with **2a** having a greater weight of evidence/usefulness than **2b** and **Class 3** is for conditions where there is evidence or general agreement that treatment or procedures are not useful/effective or may be harmful.

[a]Refer to Chapter 35, "Dyslipidemia," for more information.

[b]Refer to Chapter 33, "Hypertension," for more information.

[c]Refer to Chapter 98, "Diabetes Mellitus," for more information.

[d]Refer to guideline for the management of patients with chronic coronary disease (Gulati M, Levy PD, Mukherjee D, et al. Circulation 2021;144:e368–454. DOI:10.1161/CIR.0000000000001029) for more information.

Data summarized from:

1. Virani SS, Newby LK, Arnold SV, et al. 2023 AHA/ACC/ACCP/ASPC/NLA/PCNA Guideline for the management of patients with chronic coronary disease. J Am Coll Cardiol 2023;82(9):833–955. DOI:10.1016/j.jacc.2023.04.003.
2. American Diabetes Association Professional Practice Committee. 6. Glycemic Goals and Hypoglycemia: Standards of Care in Diabetes-2024. Diabetes Care 2024;47(Suppl 1):S111–25.

Secondary prevention medications

- ✓ **ASA** (75– 162 mg/ d) reduces cardiovascular events, including repeat revascularization, MI, and cardiac death, by approximately 33%.
- ✓ ASA 81 mg appears to be sufficient for most patients (primary or secondary prevention for both IHD and CVA.
- ✓ ASA desensitization may be performed in patients with ASA allergy.
- ✓ **Clopidogrel** (75 mg/ d) can be used in those allergic/ intolerant of ASA.
- ✓ **ACEIs** and **ARBs** have CV protective effects that reduce the recurrence of ischemic events.
- ✓ ACEI therapy, or ARBs in those intolerant to ACEIs, should be used in all patients with an LVEF < 40%, HTN, diabetes, or CKD. It is reasonable to use ACEI in all stable angina patients.

- ✓ **Statins** have a marked effect in secondary prevention, and all patients with IHD who can tolerate therapy should be on a high-potency statin.
- ✓ In secondary prevention of CHD, statins have the most evidence demonstrating a robust mortality benefit.
- ✓ **Proprotein convertase subtilisin/ kexin type 9 (PCSK9) inhibitors** confer a mortality benefit to patients with IHD whose LDL levels remain > 70 mg/ dL despite high-intensity statins.
- ✓ Currently, expense and insurance coverage limit the use of this class of medications.
- ✓ **Ezetimibe** also improves CV outcomes among patients with IHD whose LDL remains > 100 mg/ dL despite high intensity statin therapy.
- ✓ For patients who cannot tolerate high-intensity statins or do not attain a 50% decrease in LDL-C (or LDL remains > 70-100 mg/dL), the addition of ezetimibe first & PCSK-9 inhibitors second is reasonable.
- ✓ **Influenza vaccination** is recommended for all patients with IHD.

New Slide

Recommendations for Renin-Angiotensin-Aldosterone Inhibitors
Referenced studies that support the recommendations are summarized in the Online Data Supplement.

COR	LOE	Recommendations
1	A	1. In patients with CCD who also have hypertension, diabetes, LVEF ≤40%, or CKD, the use of ACE inhibitors, or ARBs if ACE inhibitor–intolerant, is recommended to reduce cardiovascular events.[1–5]
2b	B-R	2. In patients with CCD without hypertension, diabetes, or CKD and LVEF >40%, the use of ACE inhibitors or ARBs may be considered to reduce cardiovascular events.[6–10]

Ref: 2023 AHA/ACC/ACCP/ASPC/NLA/PCNA Guideline for the Management of Patients With Chronic Coronary Disease: A Report of the American Heart Association/American College of Cardiology Joint Committee on Clinical Practice Guidelines. https://www.ahajournals.org/doi/10.1161/CIR.0000000000001168

Revascularization

- ✓ In general, medical therapy with at least two classes of antianginal agents should be attempted before medical therapy is considered a failure and coronary revascularization pursued in stable angina.

- ➢ **Variable Threshold Angina**

- ✓ Patients with variable threshold angina require pharmacotherapy for vasospasm.
- ✓ Both CCBs and nitrates are effective for chronic therapy. CCBs may be preferred because they are dosed less frequently.
- ✓ β-blockers are not appropriate therapy for vasospasm because they may induce coronary vasoconstriction and prolong ischemia.

TOP 10 TAKE-HOME MESSAGES FOR CHRONIC CORONARY DISEASE

New Slide

1. Emphasis is on team-based, patient-centered care that considers social determinants of health along with associated costs while incorporating shared decision-making in risk assessment, testing, and treatment.

2. Nonpharmacologic therapies, including healthy dietary habits and exercise, are recommended for all patients with chronic coronary disease (CCD).

3. Patients with CCD who are free from contraindications are encouraged to participate in habitual physical activity, including activities to reduce sitting time and to increase aerobic and resistance exercise. Cardiac rehabilitation for eligible patients provides significant cardiovascular benefits, including decreased morbidity and mortality outcomes.

4. Use of sodium glucose cotransporter 2 inhibitors and glucagon-like peptide-1 receptor agonists are recommended for select groups of patients with CCD, including groups without diabetes.

5. New recommendations for beta-blocker use in patients with CCD: (a) Long-term beta-blocker therapy is not recommended to improve outcomes in patients with CCD in the absence of myocardial infarction in the past year, left ventricular ejection fraction ≤50%, or another primary indication for beta-blocker therapy; and (b) Either a calcium channel blocker or beta blocker is recommended as first-line antianginal therapy.

New Slide

TOP 10 TAKE-HOME MESSAGES FOR CHRONIC CORONARY DISEASE

6. Statins remain first line therapy for lipid lowering in patients with CCD. Several adjunctive therapies (eg, ezetimibe, PCSK9 [proprotein convertase subtilisin/kexin type 9] inhibitors, inclisiran, bempedoic acid) may be used in select populations, although clinical outcomes data are unavailable for novel agents such as inclisiran.

7. Shorter durations of dual antiplatelet therapy are safe and effective in many circumstances, particularly when the risk of bleeding is high and the ischemic risk is low to moderate.

8. The use of nonprescription or dietary supplements, including fish oil and omega-3 fatty acids or vitamins, is not recommended in patients with CCD given the lack of benefit in reducing cardiovascular events.

9. Routine periodic anatomic or ischemic testing without a change in clinical or functional status is not recommended for risk stratification or to guide therapeutic decision-making in patients with CCD.

10. Although e-cigarettes increase the likelihood of successful smoking cessation compared with nicotine replacement therapy, because of the lack of long-term safety data and risks of sustained use, e-cigarettes are not recommended as first-line therapy for smoking cessation.

Ref: 2023 AHA/ACC/ACCP/ASPC/NLA/PCNA Guideline for the Management of Patients With Chronic Coronary Disease: A Report of the American Heart Association/American College of Cardiology Joint Committee on Clinical Practice Guidelines. https://www.ahajournals.org/doi/10.1161/CIR.0000000000001168

For your reference

Recommendations for Antiplatelet Therapy and Oral Anticoagulants
Referenced studies that support the recommendations are summarized in the Online Data Supplements.

COR	LOE	Recommendations
Antiplatelet Therapy Without Oral Anticoagulants		
1	A	1. In patients with CCD and no indication for oral anticoagulant therapy, low-dose aspirin 81 mg (75-100 mg) is recommended to reduce atherosclerotic events.*[1-3]
1	A	2. In patients with CCD treated with PCI, dual antiplatelet therapy (DAPT) consisting of aspirin and clopidogrel for 6 months post PCI followed by single antiplatelet therapy (SAPT) is indicated to reduce MACE and bleeding events.*[4-7]
2a	A	3. In select patients with CCD treated with PCI and a drug-eluting stent (DES) who have completed a 1- to 3-month course of DAPT, P2Y12 inhibitor monotherapy for at least 12 months is reasonable to reduce bleeding risk.[8-12]
2b	A	4. In patients with CCD who have had a previous MI and are at low bleeding risk, extended DAPT beyond 12 months for a period of up to 3 years may be reasonable to reduce MACE.*[13,14]
2b	B-R	5. In patients with CCD and a previous history of MI without a history of stroke, transient ischemic attack (TIA), or ICH, vorapaxar may be added to aspirin therapy to reduce MACE.[15-17]

Ref: 2023 AHA/ACC/ACCP/ASPC/NLA/PCNA Guideline for the Management of Patients With Chronic Coronary Disease: A Report of the American Heart Association/American College of Cardiology Joint Committee on Clinical Practice Guidelines.
https://www.ahajournals.org/doi/10.1161/CIR.0000000000001168

For your reference

2b	B-R	6. In patients with CCD, the use of DAPT after CABG may be useful to reduce the incidence of saphenous vein graft occlusion.[18]
3: No benefit	A	7. In patients with CCD without recent ACS or a PCI-related indication for DAPT, the addition of clopidogrel to aspirin therapy is not useful to reduce MACE.*[19]
3: Harm	A	8. In patients with CCD and previous stroke, TIA, or ICH, vorapaxar should not be added to DAPT because of increased risk of major bleeding and ICH.[15,20]
3: Harm	B-R	9. In patients with CCD and previous stroke, TIA, or ICH, prasugrel should not be used because of risk of significant or fatal bleeding.[21]
3: Harm	B-R	10. In patients with CCD, chronic nonsteroidal anti-inflammatory drugs should not be used because of increased cardiovascular and bleeding complications.*[22]
1	B-R	11. In patients with CCD who have undergone elective PCI and who require oral anticoagulant therapy, DAPT for 1 to 4 weeks followed by clopidogrel alone for 6 months should be administered in addition to DOAC.†[23]
2a	B-R	12. In patients with CCD who have undergone PCI and who require oral anticoagulant therapy, continuing aspirin in addition to clopidogrel for up to 1 month is reasonable if the patient has a high thrombotic risk and low bleeding risk.*[23–25]

Ref: 2023 AHA/ACC/ACCP/ASPC/NLA/PCNA Guideline for the Management of Patients With Chronic Coronary Disease: A Report of the American Heart Association/American College of Cardiology Joint Committee on Clinical Practice Guidelines.
https://www.ahajournals.org/doi/10.1161/CIR.0000000000001168

2b	B-R	13. In patients with CCD who require oral anticoagulation and have a low atherothrombotic risk, discontinuation of aspirin therapy with continuation of DOAC alone may be considered 1 year after PCI to reduce bleeding risk.*[26]
2b	C-LD	14. In patients with CCD who require oral anticoagulation, DOAC monotherapy may be considered if there is no acute indication for concomitant antiplatelet therapy.[27–29]
Antiplatelet Therapy and Low-Dose DOAC		
2a	B-R	15. In patients with CCD without an indication for therapeutic DOAC or DAPT and who are at high risk of recurrent ischemic events but low-to-moderate bleeding risk, the addition of low-dose rivaroxaban 2.5 mg twice daily to aspirin 81 mg daily is reasonable for long-term reduction of risk for MACE.[30–32]
DAPT and Proton Pump Inhibitor (PPI)		
2a	B-R	16. In patients with CCD on DAPT, the use of a PPI can be effective in reducing gastrointestinal bleeding risk.*[33]

*Modified from the 2016 ACC/AHA Guideline Focused Update on DAPT.[34]
†Modified from the 2021 ACC/AHA/SCAI Guideline for Coronary Artery Revascularization.[35]

For your reference

Ref: 2023 AHA/ACC/ACCP/ASPC/NLA/PCNA Guideline for the Management of Patients With Chronic Coronary Disease: A Report of the American Heart Association/American College of Cardiology Joint Committee on Clinical Practice Guidelines.
https://www.ahajournals.org/doi/10.1161/CIR.0000000000001168

For your reference

Recommendations for Use of SGLT2 Inhibitors and GLP-1 Receptor Agonists
Referenced studies that support the recommendations are summarized in the Online Data Supplement.

COR	LOE	Recommendations
1	A	1. In patients with CCD who have type 2 diabetes, the use of either an SGLT2 inhibitor[1–8] or a GLP-1 receptor agonist[9–17] with proven cardiovascular benefit is recommended to reduce the risk of MACE.
Cost Value Statement: High Value	B-NR	2. In patients with CCD and type 2 diabetes, addition of a GLP-1 receptor agonist at US prices is projected to be of high value compared with standard of care.[18]
Cost Value Statement: Intermediate Value	B-NR	3. In patients with CCD and type 2 diabetes, addition of an SGLT2 inhibitor at US prices is projected to be of intermediate value compared with standard of care.[18]
1	A	4. In patients with CCD and heart failure with LVEF ≤40%, use of an SGLT2 inhibitor is recommended to reduce the risk of cardiovascular death and heart failure hospitalization[19–22] and to improve QOL,[23,24] irrespective of diabetes status.*

Ref: 2023 AHA/ACC/ACCP/ASPC/NLA/PCNA Guideline for the Management of Patients With Chronic Coronary Disease: A Report of the American Heart Association/American College of Cardiology Joint Committee on Clinical Practice Guidelines.
https://www.ahajournals.org/doi/10.1161/CIR.0000000000001168

For your reference

Cost Value Statement: Intermediate Value	**B-NR**	5. In patients with CCD and heart failure with LVEF ≤40%, addition of an SGLT2 inhibitor to GDMT, irrespective of diabetes status, is projected to be of intermediate value at US prices.[25,26]
2a	**B-R**	6. In patients with CCD and heart failure with LVEF >40%, use of an SGLT2 inhibitor can be beneficial in decreasing heart failure hospitalizations[27,28] and to improve QOL,[4,29] irrespective of diabetes status.
Cost Value Statement: Intermediate Value	**B-NR**	7. In patients with CCD and heart failure with LVEF >40%, addition of an SGLT2 inhibitor to GDMT, irrespective of diabetes status, is projected to be of uncertain value at US prices.[30]

*Modified from the 2022 AHA/ACC/HFSA Guideline for the Management of Heart Failure.[31]

Ref: 2023 AHA/ACC/ACCP/ASPC/NLA/PCNA Guideline for the Management of Patients With Chronic Coronary Disease: A Report of the American Heart Association/American College of Cardiology Joint Committee on Clinical Practice Guidelines. https://www.ahajournals.org/doi/10.1161/CIR.0000000000001168

For your reference

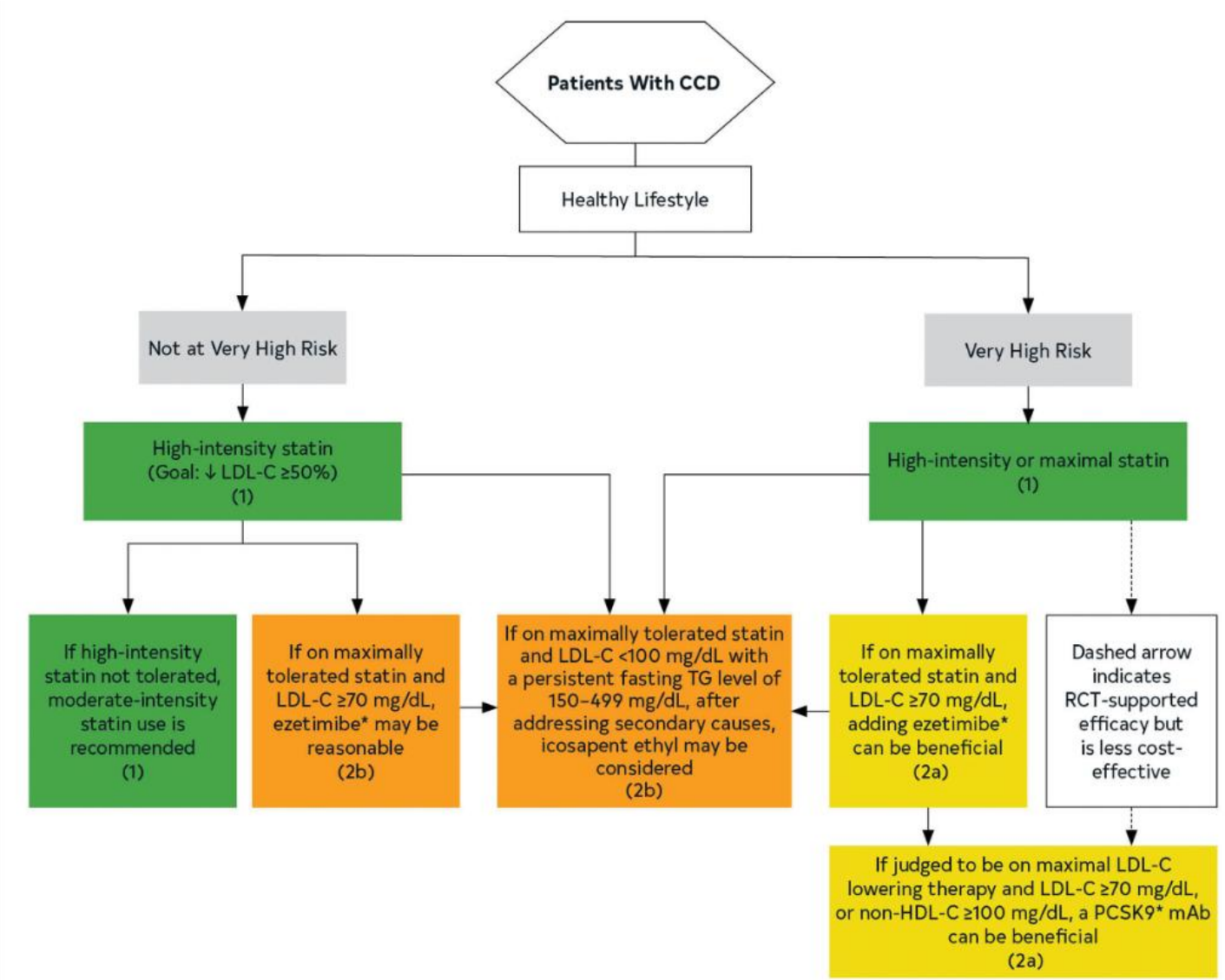


Figure 8. Lipid Management in Patients With CCD.

Ref: 2023 AHA/ACC/ACCP/ASPC/NLA/PCNA Guideline for the Management of Patients With Chronic Coronary Disease: A Report of the American Heart Association/American College of Cardiology Joint Committee on Clinical Practice Guidelines. https://www.ahajournals.org/doi/10.1161/CIR.0000000000001168

For your reference

Recommendation for Colchicine
Referenced studies that support the recommendation are summarized in the Online Data Supplement.

COR	LOE	Recommendation
2b	B-R	1. In patients with CCD, the addition of colchicine for secondary prevention may be considered to reduce recurrent ASCVD events.[1,2]

Ref: 2023 AHA/ACC/ACCP/ASPC/NLA/PCNA Guideline for the Management of Patients With Chronic Coronary Disease: A Report of the American Heart Association/American College of Cardiology Joint Committee on Clinical Practice Guidelines. https://www.ahajournals.org/doi/10.1161/CIR.0000000000001168

For your reference

Recommendations for Immunizations
Referenced studies that support the recommendations are summarized in the Online Data Supplement.

COR	LOE	Recommendations
1	A	1. In patients with CCD, an annual influenza vaccination is recommended to reduce cardiovascular morbidity, cardiovascular death, and all-cause death.[1–7]
1	C-EO	2. In patients with CCD, coronavirus disease 2019 (COVID-19) vaccination is recommended per public health guidelines to reduce COVID-19 complications.[8–10]
2a	B-NR	3. In patients with CCD, a pneumococcal vaccine is reasonable to reduce cardiovascular morbidity and mortality and all-cause death.[11–13]

Ref: 2023 AHA/ACC/ACCP/ASPC/NLA/PCNA Guideline for the Management of Patients With Chronic Coronary Disease: A Report of the American Heart Association/American College of Cardiology Joint Committee on Clinical Practice Guidelines. https://www.ahajournals.org/doi/10.1161/CIR.0000000000001168

For your reference

Figure 7. Recommended Nutrition.

Ref: 2023 AHA/ACC/ACCP/ASPC/NLA/PCNA Guideline for the Management of Patients With Chronic Coronary Disease: A Report of the American Heart Association/American College of Cardiology Joint Committee on Clinical Practice Guidelines. https://www.ahajournals.org/doi/10.1161/CIR.0000000000001168

For your reference

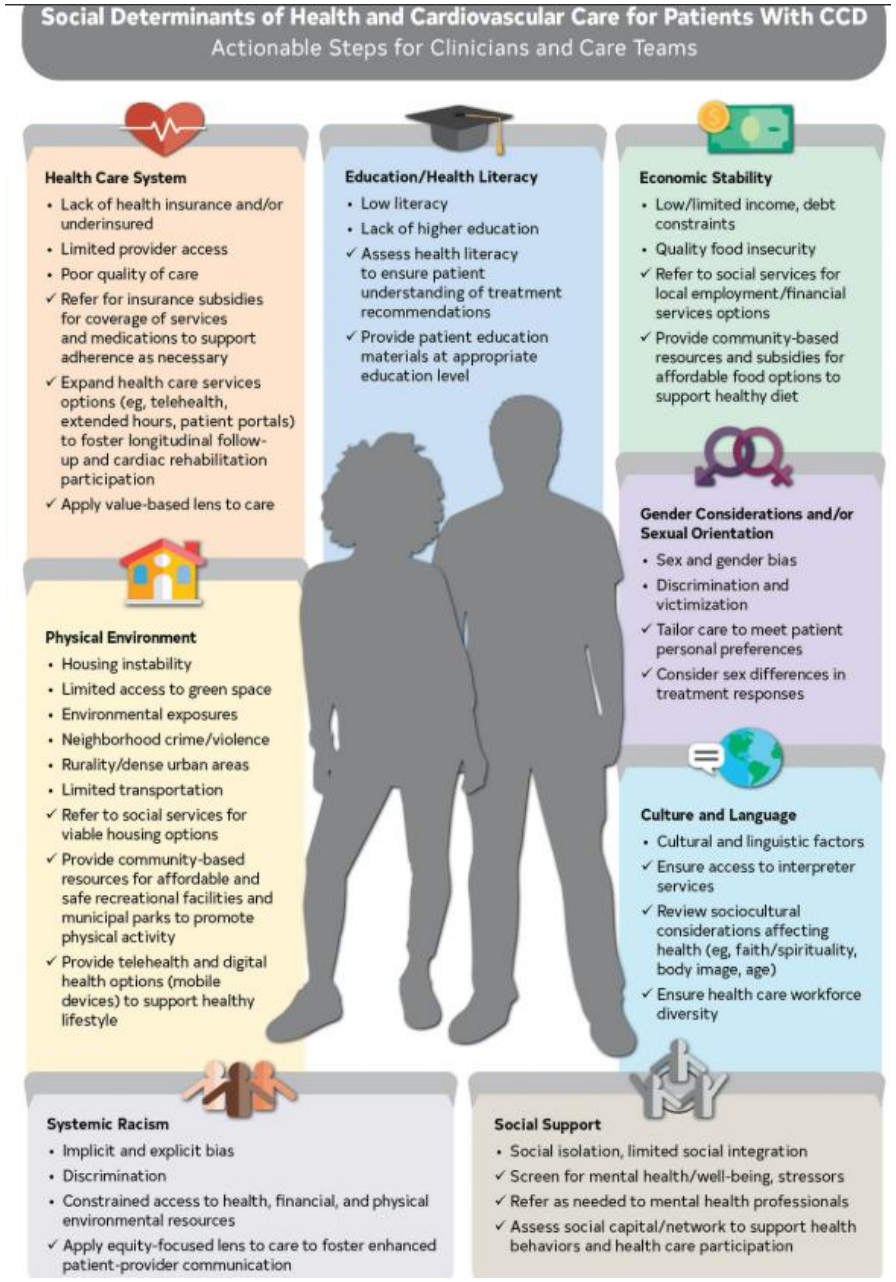


Figure 6. Social Determinants of Health and Cardiovascular Care for Patients With CCD.

• Identifies SDOH issue. ✓ Considerations for clinicians and care teams. CCD indicates chronic coronary disease, and SDOH, social determinants of health.

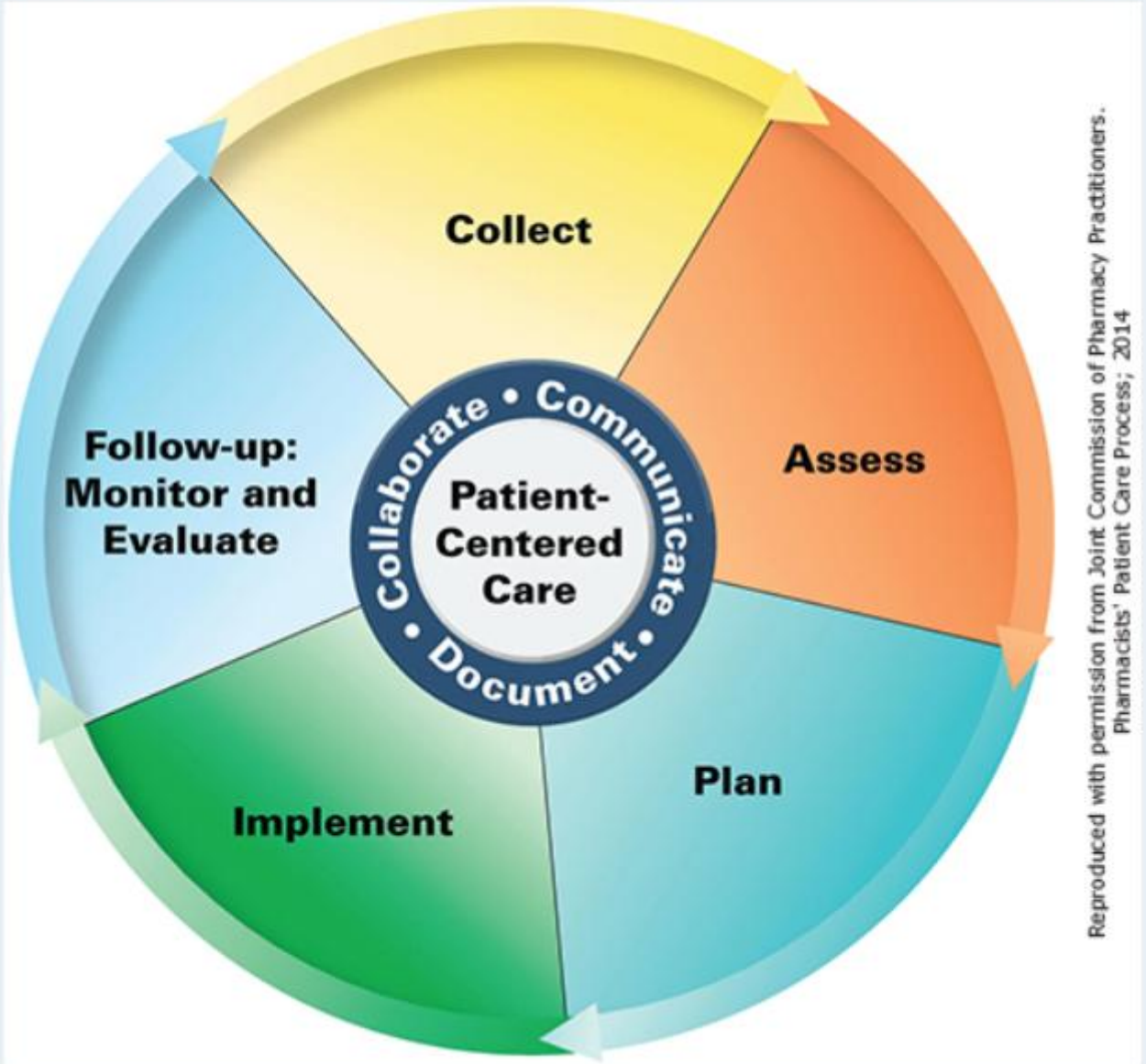
Ref: 2023 AHA/ACC/ACCP/ASPC/NLA/PCNA Guideline for the Management of Patients With Chronic Coronary Disease: A Report of the American Heart Association/American College of Cardiology Joint Committee on Clinical Practice Guidelines. https://www.ahajournals.org/doi/10.1161/CIR.0000000000001168

➢ Monitoring/ Follow-Up

- ✓ Improvement of symptoms can be assessed by number of angina episodes, weekly SL NTG use, and increased exercise capacity or duration of exertion needed to induce angina.
- ✓ Close patient follow-up is a critical component of the treatment of CAD because lifestyle modification and secondary risk factor reduction require serial reassessment and interventions (statins, BP, A1C goals, smoking cessation, weight loss, and regular exercise).
- ✓ Relatively minor changes in anginal symptoms can be safely treated with titration and/ or addition of antianginal medications.
- ✓ Significant changes in anginal complaints (frequency, severity, or time to onset with activity) should be evaluated by either stress testing or cardiac angiography as warranted.
- ✓ Once patients have been optimized on medical therapy, symptoms should improve over 2 to 4 weeks and remain stable until the disease progresses.
- ✓ Monitor for adverse drug effects :headache and dizziness with nitrates; fatigue and lassitude with β-blockers; and peripheral edema, constipation, and dizziness with CCBs.

New Slide

Patient Care Process for Chronic Coronary Disease (CCD)



New Slide

Collect

- Patient characteristics (eg, age, sex, pregnancy status)
- Description of chest discomfort and/or related symptoms (eg, precipitating factors, palliative measures, quality, location, radiation, and severity)
- Patient medical (personal and family) and social histories (eg, tobacco/ethanol use), dietary habits (eg, intake of foods high in sodium, cholesterol, and/or saturated fat), and physical activity (eg, frequency and duration of moderate-intensity aerobic activity)
- Current medications including over-the-counter (OTC) medications (eg, aspirin-containing medications, nonsteroidal anti-inflammatory agents), herbals/dietary supplements
- History of allergy or intolerance to previous medications
- Objective data
- BP, HR, respiratory rate (RR), height, weight, O_2-saturation
    - Labs: serum creatinine (SCr), potassium (K^+), hemoglobin (Hgb), platelets, liver function tests (LFTs), lipid profile, blood glucose, A1c
    - Diagnostic testing results

New Slide

Assess

- Description of chest discomfort to determine differential diagnosis and classification of angina symptoms (Tables 36-1 to 36-3)
- Presence of provoking factors (eg, exertion, mental/emotional stress, tachyarrhythmia, high adrenergic state including the use of stimulant medications, and exposure to cold)
- Presence/control of risk factors for CCD (eg, HTN, dyslipidemia, DM, smoking, and obesity)
- Presence/control of CCD-related complications (eg, MI, HF, and stroke)
- Adverse drug reactions from current/previous medications used to treat/prevent angina symptoms or major adverse cardiac events (MACE)
- Previous/recent revascularization procedures (eg, percutaneous coronary intervention [PCI] with/without stenting, and coronary artery bypass graft [CABG] surgery)
- Contraindications to medications to treat/prevent angina symptoms and/or prevent MACE
- Barriers (eg, social determinants of health) that may impair adherence to the care plan

New Slide

Plan*

- Initiate/modify drug therapy to treat and prevent angina symptoms, prevent MACE, and address risk factors for CCD, including specific drug(s), dose, route, frequency, and duration (see Fig. 36-2, Tables 36-4 and 36-5)
- Monitoring parameters: efficacy (eg, signs and symptoms of angina and CCD-related complications) and adverse drug reactions; frequency and timing of follow-up
- Patient education: the purpose of treatment, lifestyle modifications, planned procedures, and drug-specific information (eg, indication, dose, route, frequency, adverse drug reactions)
- Self-monitoring for worsening angina symptoms, signs and symptoms of CCD-related complications, adverse drug reactions, when to seek emergency medical attention
- Address barriers to adherence to medications and lifestyle modification
- Referrals to other providers (eg, primary care provider, endocrinologist, dietician, and smoking cessation)

New Slide

Implement*

- Provide patient education regarding all elements of the treatment plan as described above
- Use motivational interviewing and coaching strategies to maximize adherence
- Schedule follow-up (eg, every 1-2 months until goals achieved, then every 6-12 months)

Follow-up: Monitor and Evaluate

- Frequency and severity of chest discomfort, sublingual nitroglycerin use, exercise tolerance, presence/control of CCD risk factors, and presence/control of CCD-related complications
- Presence of adverse drug reactions and drug-drug interactions
- Patient adherence to treatment plan using multiple sources of information

****Collaborate with the patient, caregivers, and other healthcare professionals.***

Thank You