Chronic Coronary Disease

Lifestyle Interventions

- Mediterranean diet can reduce CV events by up to 65% in < 4yrs while improving comorbidities
- Cardiac rehab with aerobic and resistance training leads to lower all-cause and CV mortality
- Weight management: GLP-1 agonists may be considered if lifestyle modifications are not adequate and BMI ≥ 27 kg/m²
  - Avoid symphathomimetics such as phentermine
  - Consider bariatric surgery if severe obesity and not meeting goal with lifestyle and meds
- Discuss smoking cessation at every visit
- Alcohol: evidence on how it impacts CV risk is inconsistent (reasonable to recommend < 1 drink for women, < 2 for men)
- Depression:
  - Rates of CV events are doubled in patients with ACS + depression, screening is thus important
- Immunizations: strong correlation between MI and respiratory infections including influenza, covid, and pneumonia

Primary Prevention of CAD(30-79 years)

Start Statin If:

- LDL ≥190 (4.92 mmol/L)
- 40 - 75 years w/ either DM, CKD 3-4, or HIV
  - "Consider" if > 75yrs
- 30-59 years - "reasonable" if 30 year risk score ≥ 10% or LDL 160-189

PREVENT ASCVD Score

- **<3% Low**
- **3- < 5%: Borderline** - "Can" start Rx, Goal LDL < 100 (2.6 mmol/L)
  - Evaluate Risk Enhancers†
  - Consider CAC score
- **5-10%: Intermediate** - "Should" start Rx, Goal LDL < 100 (2.6 mmol/L)
  - If uncertain, consider CAC score
- **≥ 10%: High** - start Rx, Goal < 70 (1.8 mmol/L)

Risk Enhancers†

- FHX premature ASCVD
- Higher risk ancestry
- High polygenic risk
- Inflammatory diseases (e.g. RA, SLE, etc)
- Lp(a) ≥ 50 mg/dL (125 nmol/L)
- hsCRP ≥2 mg/L
- TG persistently ≥150 (1.7 mmol/L) (fasting)
- CKM syndrome
- LDL persistently ≥160–189 (4.1–4.9 mmol/L), non–HDL ≥190–219 or apoB ≥120 mg/dL
- Reproductive risk markers (early menopause, preeclampsia, GDM, gestational HTN, preterm delivery)

Scenario	Antithrombotic Therapy	Duration
Chronic Coronary Disease	Aspirin 81 mg/day	Lifelong if tolerated
CCD + PCI	DAPT	Post-PCI for stable angina: DAPT 6 mo → single antiplatelet (extend up to 3 yr if low bleeding risk; shorten to 1–3 mo DAPT if high bleeding risk). After ACS: DAPT × 12 mo
CCD with oral anticoagulation + recent PCI	Triple therapy: Oral anticoagulant + DAPT (Aspirin + Clopidogrel)	Anticoagulation strategy: Triple therapy ×1 mo → anticoagulant + clopidogrel 2–6 mo → anticoagulant alone >6 mo.

CAC Score

- **0** - allows downward risk reclassification (not for DM, current smoker, strong FHX)
- **1-99** - Goal < 100 (2.6 mmol/L), if untreated, repeat in 5yrs
- **100-299 or >75%** - statin is reasonable, Goal LDL < 70 (1.8 mmol/L)
- **300-999** - Goal LDL < 70 (consider < 55)
- **>1000** - Goal LDL < 55 (1.4 mmol/L)
- Incidental moderate to severe CAC - Goal: LDL < 70 mg/dL (1.8 mmol/L)
- Mild incidental CAC - Goal LDL < 100 mg/dL (2.6 mmol/L)

ASCVD and LDL Goals

- ASCVD (not very high risk): Goal LDL < 70 (1.8mmol/L) and reasonable to aim for < 55 mg/dL
- ASCVD (very high risk†): Goal LDL < 55 (1.4mmol/L)
- Goal 50% reduction of LDL using statin first line then ezetimibe, PCSK9-I, bempedoic acid (Nexletol), siRNA or inclisiran (Leqvio), icosapent ethyl (Vascepa)

† Very high risk: Multiple major ASCVD events (ACS, MI, CVA, PAD) or 1 major ASCVD + multiple high-risk conditions (≥ 65 yrs, FH, prior PCI/CABG, DM, HTN, CKD 3-4, current smoking, LDL ≥ 100 despite statin + ezetimibe, h/o heart failure)

Test	Use When	Key Limitation / Caution	Quick Tip
Exercise ECG	Low-risk, can exercise, ECG readable	LBBB, paced rhythm, WPW, abnormal baseline ECG	First choice if able to exercise
Stress Echo	Need ischemia or valve info; ECG uninterpretable	Poor imaging in obesity/COPD; caution in severe AS	Exercise preferred; use dobutamine if patient can't exercise
Nuclear Stress	Cannot exercise or poor echo windows	Radiation; avoid vasodilators in active asthma	Good for LBBB; vasodilator used instead of dobutamine
Stress CMR	Detailed perfusion or scar assessment	MRI contraindications; claustrophobia; CKD	No radiation; best image quality
Coronary Calcium (CAC)	Low-risk, stable chest pain	Not for acute symptoms; doesn't show stenosis	CAC = 0 → very low short-term risk
CCTA	Intermediate-risk; want anatomy	Contrast; HR control; incidental findings	Increasingly first-line for stable chest pain
Invasive Angio	High-risk or persistent symptoms	Invasive; procedural risks	Diagnose + treat in same session

References: ACC/AHA 2023 Chronic Coronary Disease Guidelines; ACC/AHA 2025 ACS Guidelines, ACC/AHA 2026 Dyslipidemia Guidelines

Anti-Anginal Meds

- Beta-blockers: First-line agents for reducing myocardial oxygen demand and preventing angina attacks.
- Calcium Channel Blockers (CCBs): For patients intolerant to beta-blockers or with contraindications (e.g., asthma, bradycardia).
- Nitrates:
  - Short-acting nitrates: Sublingual nitroglycerin for immediate relief of angina.
  - Long-acting nitrates: For patients with frequent angina; ensure nitrate-free intervals to prevent tolerance.
- Ranolazine (Ranexa): Consider for refractory angina not relieved by other medications

Acute Chest Pain (Outpatient)

- EKG within 10min of arrival
  - ST elevation, new LBBB, Q waves, or new T-wave inversions → possible ACS, to ER
- Clinical prediction rules can guide need for further testing
  - Marburg, INTERCHEST, CAD Consortium for outpatients
    - Suspicious for ACS → ER
    - Low to intermediate risk → stress test, CMR or CCTA

Coronary Angiography in CAD

Overview

- Coronary Angiography is an invasive imaging procedure to visualize the coronary arteries, assessing for stenosis, blockages, or abnormalities.
- Procedure: Performed using a catheter inserted through the femoral or radial artery, with contrast dye injected to view the coronary arteries on X-ray.
- Indications
  - Acute Coronary Syndromes (ACS): Urgent angiography indicated in STEMI and high-risk NSTEMI for immediate revascularization.
  - Unstable Angina: In symptomatic patients unresponsive to medical therapy or at high risk based on stress testing.
  - Stable CAD with High-Risk Features: Used when non-invasive tests show high-risk findings (e.g., severe ischemia, left main or multi-vessel disease).

Clinical Decision Pathways

- HEART Pathway, EDACS, mADAPT, NOTR, 2020 ESC pathway, Marburg, INTERCHEST, CAD Consortium
- Those who are intermediate risk or intermediate to high risk benefit most from cardiac imaging and testing
- There is no validated clinical decision tool with sufficient sensitivity to safely rule out ACS in the outpatient setting. However, outpatient clinicians can use the Marburg Heart Score or INTERCHEST to assess the likelihood of cardiac origin for intermittent chest pain

CCTA vs. Stress Testing

- Preferred < 65yrs and in those w/o known CAD
- >65yrs or when more obstructive CAD is suspected → Stress testing
- CCTA w/ Functional Fractional Reserve (FFR) can estimate lesion-specific ischemia
- CCTA with no obstruction → 2 yr warranty period
  - Normal stress test → 1 yr warranty period
- Stress imaging options: exercise or pharmacologic stress with ECG, echo, MPI w/ SPECT or PET, CMR imaging

Revascularization Options*

Percutaneous Coronary Intervention (PCI)

- Preferred for single-vessel disease or low-complexity coronary artery disease.
- Indicated for urgent revascularization (e.g., ST-elevation myocardial infarction (STEMI) or high-risk non-STEMI) or when surgical risk is high.
- Drug-eluting stents (DES) are preferred over bare-metal stents to reduce the risk of restenosis.

Coronary Artery Bypass Grafting (CABG)

- Preferred in patients with:
  - Multivessel disease (especially three-vessel disease with significant proximal LAD involvement).
  - Diabetes mellitus + multivessel dx
  - Left ventricular dysfunction (EF < 35%) with significant coronary artery disease.
  - Left main coronary artery disease, especially if stenosis >50% or involvement of the bifurcation or high complexity anatomy.

* In patients with angina, revascularization improves symptoms and quality of life more than pharmacotherapy alone.
* In stable CAD, PCI does not reduce mortality or prevent future heart attacks compared to optimal medical therapy.

Diabetes and Chronic Coronary Disease

Diabetes is a Major CAD Risk Factor:

- Increased Risk of Atherosclerosis: Diabetes accelerates atherosclerosis due to chronic hyperglycemia, increased inflammation, and dyslipidemia (e.g., elevated triglycerides, low HDL).

Treatment

- Statins, aspirin, optimal blood sugar control
- Both SGLT2 inhibitors and GLP-1 agonists offer cardioprotective benefits and reduce cardiovascular mortality in diabetics

Colchicine and CAD (Secondary Prevention)

Mechanism of Action

Anti-Inflammatory Effect: colchicine

Indications

- Secondary Prevention in CAD: colchicine may be considered for patients with stable CAD or recent MI who are already on standard therapy
- May be particularly beneficial in patients with elevated inflammatory markers (e.g., high hs-CRP).

Key Considerations

- Dosing: Low-dose (0.5 mg once daily) is used to minimize side effects.
- Side Effects: Gastrointestinal symptoms (e.g., diarrhea), myopathy (increased risk with statins), and potential drug interactions, especially with CYP3A4 inhibitors.
- Contraindications: Severe renal or hepatic impairment due to increased risk of toxicity.

References: ACC/AHA 2023 Chronic Coronary Disease Guidelines; ACC/AHA 2026 Dyslipidemia Guidelines, 2021 ACC/AHA chest pain guidelines