CAD

- Epidemiology:
  - CAD is the leading cause of death for adults both in the United States and worldwide.
  - The cost of CAD in the United States was $555 billion in 2016 and is expected to rise to $1.1 trillion by 2035.
  - ~80% of CAD is preventable with a healthy lifestyle.
- *Incidence*
  - In the United States, the lifetime risk of a 40-year-old developing CAD is 49% for men and 32% for women.
- *Prevalence*
  - In the United States, 28.4 million people carry a diagnosis of CAD, whereas 7.12 million have angina pectoris.

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CAD signal symptoms

- Signal symptoms
  - Substernal Chest pain, tightness, or discomfort frequently radiate to jaw, back or arms last 2 minutes to 15 with stable or unstable angina or constant with STEMI NSTEMI and sometimes unstable angina.
  - Atypical symptoms in the elderly:
    - Dyspnea and exertional fatigue common signal symptoms in the elderly
    - Often with stable angina, Patient may present with non cardiac symptoms and nonspecific symptoms
      - Dyspnea, diaphoresis, fatigue, belching, nausea, dizziness, or indigestion that usually occurs with exertion or stress.

Risk factors

- **Modifiable Risk factors:**
  - Hypertension:
  - Hyperlipidemia:
  - Smoking
  - Diet: high in fat, and low in grains and fruits and vegetables
  - Diabetes:
  - Obesity
  - Sedentary life style
  - ETOH above recommendations
  - Stress

- **Non Modifiable risk factors**
  - Genetic
    - First degree relative with CAD
    - Thrombogenic disorders
  - Age
    - 45 or above for males
    - 55 or above for females
  - Male gender
  - Socioeconomic factors
  - Type A personality
  - Racial minorities :
    - AA (sociecomonic, access to care and genetically higher sensitivity to salt)
    - Hispanic paradox: Higher rate of DM, HTN, obesity but less Heart disease than white.
  - Stress

Symptomatic CAD: Stable Angina (class)

- **Diagnosis: initial**
- Complete blood count, lipid profile, HgbA1c, lipid panel, for risk stratification
- CMP to rule out electrolyte abnormalities and assess renal function
- ECG
- Chest Xray to r/o other causes of pain.
- **F/U tests:**
- Stress testing is most helpful for patients at intermediate risk of CAD.
- Echocardiogram (FYI: A normal Echo does not r/o CAD)
- CT coronary angiography or cardiac MRI can be considered as a supplement/alternative to stress testing in patients with continued symptoms despite negative stress testing
- **Cardiac catheterization with coronary angiography is the gold standard** for confirmation and delineation of coronary disease and direction of interventional therapy or surgery.

Prevention and treatment of CAD

- General measures
  - Hypertension: <130/80 mm Hg if tolerated
  - Smoking cessation
  - Diet: Low fat, high in grains, fruits, vegetables and omega 3 fatty acids
  - Hyperlipidemia: Follow ATP IV guidelines
  - Diabetes: A1C less than 7 (though avoid hypoglycemic episodes)
  - Weight management
  - ETOH intake one or less drink equivalent daily

Pharmaceutical treatment of symptomatic CAD

- Antianginal therapy:
  - Beta blockers: Metoprolol, carvedilol.
    - Decrease O2 demand, and improve symptoms of angina
    - Coreg, Metoprolol start low and titrate slowly.
  - CCBs: Dihydropyridine CCBs (nifedipine, Amlodipine) preferred.
    - Arterial vasodilation, decrease O2 demand, and improve coronary blood flow
    - Nondihydropyridine CCBs (diltiazem, verapamil) have negative inotropic effects (decrease HR-> decrease Cardiac output) Do not use specially subtype if concomitant Systolic dysfunction
  - Nitrates:
    - Dilate veins and arteries including Coronary circulation.
    - 0.4 mg sublingual every 5 minutes for 2 t 03 doses during acute angina symptoms
  - Long acting Nitrate
    - For patient with frequent angina symptoms to prevent angina
    - Isosorbide mononitrate start at 30 mg ER daily.
    - May cause headache and hypotension but usually improved with continued usage

Pharmaceutical treatment of CAD

Post MI with CAD: Ace or ARB is absolutely indicated and recommended in combo with BB to prevent cardiac remodeling and improve survival rate.

lipid-lowering agents:

- Per guidelines: High-intensity statin therapy is indicated for all patients with CAD regardless of lipid levels.
  - LDL goal: 100 mg/dl the more aggressive goal is <70 mg/dl.
- Statin therapy should also be encouraged for those with high CAD risk (lifetime risk ≥7.5–10%).
- Atorvastatin (20 to 80 mg/day) and rosuvastatin (10 to 40 mg/day) are high-intensity statins. Again think twice about a max dose on elderly patient
- Ezetimibe may be added to statin therapy if LDL is not at goal

Pharmaceutical treatment of CAD

- Antiplatelets: decrease risk of thrombosis
- All patient if not contraindicated should get a daily dose of
- Aspirin (75 to 162 mg/day)
- Clopidogrel (75 mg/day) may be used in patients with contraindications to aspirin.
- Dual antiplatelet therapy with aspirin + clopidogrel, prasugrel, or ticagrelor is indicated after MI or percutaneous coronary intervention (PCI) (use prasugrel only after PCI. Do not use in patient with CVA history).

Ongoing care

- Lifestyle modifications should be aggressively stressed at every visit.
- Compliance with treatment plan. Diet/exercise/Medications/Follow-ups
- Frequent follow-up after initial event: every 3 months in first year and then 1 to 2 times per year