Angina Pectoris *Presents as: Tight heart, uncomfortable pressure, fullness, squeezing or a pin in the center of the chest*

CAD #1 cause of death: Risk=Hyperlipidemia, Hypertension, Diabetes, Smoking, Obesity
Myocardial ischemia due to inadequate oxygen delivery to the myocardium; Chest pain or discomfort due to Coronary Heart Disease

Ischemia: ↓O2 supply→ ↓Activity of the NaKATPase→ ↑Intracellular Na* → ↓Na/Ca exchange: ↑Intracellular Ca, ↑Diastolic pressure*= ↓coronary blood flow (this happens during diastole)

- Stable angina: Episodes of chest discomfort on exertion: Stress/ Exercise induced
- Unstable angina: ↓O2 supply ischemia: Chest pain at resnt
- Prinzmental angina: coronary artery spams at rest: *younger person, no risk factors: Can be induced by Ach administration**

Combination therapy: ↑effectiveness + ↓adverse effects
Bblockers can ↓ Nitrate induced: reflex tachycardia
Nitrates can ↓Bblocker induced: *increased end diastolic volume + increased ejection time*
Nitrates + b-blockers + CCBs: Uncontrolled stable angina

Treatment: Goal: Decrease O2 demand by: ↓*HR, contractility, afterload + preload* + ↑O2 supply via promoting coronary blood flow

- **Chronic stable angina:**
  - Long acting Nitrates, CCB, B blockers
  - 2nd line: Ranolazine
- **Unstable angina:** Antiplatelets, Anti-Coagulants, Nitroglycerin, BBlockers, ACEi
- Vasospastic angina: Nitrates + Calcium channel blockers
  - *Never give B blocker: unopposed α constriction*
- **Emergency treatment of Angina:**
  MONA: ***Morphine, Oxygen, Nitroglycerin, Aspirin***

First Line	**Nitrates**	Low Bioavailability: ↑First pass metabolism Prodrug: Metabolized by *glutathione S-transferase:* **Release NO in Large Veins** + Platelets: → +Guanylcyclase→ ↑**cGMP**→ +PKG → ↓intracellular Ca→ **Venous Vasodilation** + ↓Platelet aggregation **↓Venous return→ ↓Myocardial Oxygen Demand** ↓Preload, ↓heart work + O2 consumption	• **Acute Coronary Syndrome: IV** • **Angina** ○ Prophylaxis: Stable Angina long acting: *Oral* ○ Acute attacks: short acting: *Sublingual* • Systolic HF: ↑SV + CO in patients *w/ **pulmonary edema** + congestion*	• **Tachyphylaxis: Acute tolerance:** *Give low dose to prevent **tolerance**→* • *Nitrate free periods: Withdrawl periods to ↓tolerence→ death or MI* • **Orthostatic Hypotension** • **Tachycardia:** *BBlockers* • Flushing, headache • Monday disease in industrial exposure* **≠PDE5 inhibitors**/ vasodilators
	Nitroglycerin *Oral, Sublingual, **IV***			
	Isosorbide Dinitrate *Oral, Sublingual Stable + Longer*			
	Isosorbide Mononitrate: *Oral*			
	Amyl nitrite *Inhaled: Acute*			**Cyanide poisoning** *Treat: **1. NaNitrite 2. Na Thiosulfate**:* *Convert cyanometHb → Thiocyanate:* *↑kidney excretion*
	B1 Blocker	*See Hypertension:* Used to Block Reflex Tachycardia from Nitrates		**≠Prinzmental Angina**
	Calcium Channel Blockers	*See Hypertension:* Coronary Vasospasm: Prizmental Angina*		
Ranolazine		**Late Inward Na Channel blocker** → ↑NaCa exchange →↓Intracellular Ca → ↓Diastolic pressure→ ↑Corononary blood flow: CYP450 metabolism	Chronic Angina Prophylaxis	Prolonged QT: ≠antiarrhtymias class I or III Constipation Dizziness *No Effect on HR or BP*