Angina

**Definitions:**

Coronary Artery Disease aka Coronary Heart disease: plague in the coronary artery

Ischemia: lack of blood flow and O2

Silent ischemia: Patient has no symptoms but is detected on EKG

Angina pectoris: chest pain b/c of myocardial ischemia. typically occurs when myocardial O2 demand exceeds myocardial O2 supply (perfusion)

MI: skin necrosis b/c of sever Ischemia

Collateral Blood vessels: a branch of an artery that my protect from myocardial ischemia

MVO2: Myocardial Oxygen Consumption

**Heart Demand**

Heart demands 75% O2 at rest

Heart demands 80% on demand

**Define Angina**

Typical Angina: For show 100% they have it if:

1. Provoked by exertion or emotional stress duration: up to 30 min

2. Chest discomfort

3. Relieved by nitroglycerin

If patient does have angina, the types include:

1.Stable angina: always there, b/c of restriction 70-90% plaque occlusion (>95% = useless)

Exertional angina 50 – 70% plaque occlusion

2. Unstable Angina: sudden b/c of break in plaque < 50% plaque occlusion 🡪 plaque rupture b/c of infllamation

3. Vasospastic Angina (Prinzemetals): b/c of vein spasm in the morning

Atypical Angina: due to ischemia (not heart) b/c it is defined as 2 of the 3 charactericts of angina

Non-Cardiac Chest Pain: PUD (Peptic Ulcer Disease), GERD (Gastroesophageal reflux disease)

**How to Relieve Angina SYMPTOMS BB, CCB then Nitrates**

1st line for angina: Beta Blockers: 1st line

Slows down heart rate 🡪 decrease demand (does NOT increase O2 supply)

Goal: HR to 60 bpm

Atenolol (Tenormin®) 50-200 mg daily

Metoprolol\* (Lopressor®) 100-400 mg daily 50 mg BID

Monitoring parameters: HR, BP, Adverse effects

2nd line for angina: CCB

First line if patient has Variant Angina

Verapamil/Diltiazem: decrease HR Verapamil 160 daily

Diltiazem: 120 daily

DHP - NiFedipine: Vasodilatory 30 mg daily

Monitor: Non-DHP + BB 🡪 bradycardia

2nd line for angina: Nitrates

MOA: increase cGMP 🡪 vasodilation 🡪

Venous = reduced preload

Arterial = reduced afterload and increase O2

Overall: decrease MVO2 demand and Increase O2 supply

12 hour nitrate free interval

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Nitrates | Dosage Form | Onset(min) | Duration | Dose |
| Nitro  glycerin | IV (hospital) | 1-2 | 3-5 min | 5-100mcg/min |
| **Sublingual** | **1-3** | **10-30 min** | **0.4-0.6mg** |
| Translingual spray | 2-4 | 10-30 min | 0.4mg metered dose |
| Transmucosal,buccal | 2-5 | 3-6hrs | 1-3mg every 3-5hr |
| Oral, SR | 30 | 4-8hrs | 6.5-9mg 3times/day |
| **Topical, oint**  Can wipe off if patient doesn’t like | **30** | **4-8hrs** | **1-2” q 4-6 hrs** |
| **Transdermal,patch** | **30-60** | **4-8 hrs** | **0.1-0.8mg/hr patch/day\*** |
| Isosorbide **di**nitrate (administer 2-3x/d; last dose no later than 7pm) | Sublingual | 2-5 | 2-4hrs | 2.5-10mg every 2-4hr |
| Chewable | 2-5 | 1-4hrs | 5-10mg q 2-4hr |
| **Oral** | **15-40** | **2-6hrs** | **1O-60mg q 4-6hr i.e 8 AM, 1 PM , and 6 PM** |
| Oral, SR | **15-40** | 4-8hrs | 40-80mg q 6-8hr |
| Isosorbide  **Mono**nitrate  Mono = 1day | **Oral (ISMO)** | **30-60** | **7-8hrs** | **20mg bid (7hrs apart)** **(i.e. 8 AM and 3 PM)** |
| **Oral, SR (IMDUR)** | **30-60** | **8-12 hrs** | **30-120mg q daily (30, 60, 120)** |

3rd line drug: Ranolazine

Pros: 1st line in patients who’s BP or HR cannot be lowered further

Cons: QT prolongation,

CYP3A4 Inhibitor (interacts with azoles (ketoconacole), HIV protease inhibitors –navir)

CYP3A4 Inhibitor – Verapamil, Diltiazem and Grape Fruit Juice

Dosing: Ranolazine ER 500 mg BID

Drugs that treat morbidity and mortality (does not treat symptoms)

**ACE Inhibitor**

MOA: Antagonize growth mediating properties of angiotensin II on SM cells preventing plaque rupture

Treat: patients with CAD (plague in coronary artery)

Benefit: MI, stroke, revascularization and worsening of angina

**Aspirin**

MOA: inhibit thromboxane irreversibly

Treat: Unstable angina, MI

Outcome: 33% reduction in CV events

Dose: ASA 81 mg PO daily

**Clopidogrel (a thienopyridine)**

Use: Where patient has allergy to aspirin

MOA: block platelet aggregation induced by ADP

Dose: 75 mg PO daily

Drug Interaction: Clopidogrel + PPI (Omeprazole) b/c of CYP2C19

Clopidogrel is a prodrug primarily metabolizd by CYP2C19

Alternative: Use Pantoprazole