**Drugs for Angina Pectoris**

* **Angina Pectoris is defines as sudden pain beneath the sternum, often radiating to the left shoulder and arm.**
* **Anginal pain is precipitated when the oxygen supply to the heart is insufficient to meet oxygen demand.**

**Most often, angina occurs secondly to atherosclerosis of the coronary arteries.**

**Drugs for Angina Pectoris**

* **Drug therapy of angina has two goals:**
1. **Prevention of myocardial infarction (MI) and death and**
2. **Prevention of myocardial ischemia and anginal pain.**
* **Two types of drugs are used to decrease the risk of MI and death: cholesterol-lowering drugs and antiplatelet drugs.**

**Our focus is on antianginal agents: organic nitrates (e.g., nitroglycerin), beta blockers (e.g., propranolol), and calcium channel blockers are discussed at length in precious chapters; hence, consideration here is limited to their use in angina.**

**Organic Nitrates**

* **The organic nitrates are the oldest and most frequently used antianginal drugs.**
* **These agents relieve angina by causing vasodilation.**
* **Nitroglycerin, the most familiar organic nitrate, will serve as our prototype for the family.**

**Nitroglycerin has been used to treat angina since 1879.**

**This drug is effective, fast acting and inexpensive.**

**Despite the availability of newer antianginal agents, Nitroglycerin remains the drug of choice for relieving acute anginal attacks.**

**Vasodilation Actions**

**Nitroglycerin acts directly on vascular smooth muscle (VSM) to promote vasodilation.**

**At usual therapeutic doses, the drug acts primarily on veins; dilation of arterioles is only modest.**

**The process begins with uptake of nitrate by VSM, followed by conversion of nitrate to its active form: nitric oxide .**

**As indicated, this conversion requires the presence of sulfhydryl groups.**

**Nitric oxide activates guanylate cyclase, an enzyme that catalyzes the formation of cyclic GMP.**

**Through a series of reactions, cyclic GMP decreases intracellulae calcium levels.**

**Since calcium is required for VSM contraction, the reduction in calcium results in vasodilation.**

**For our purpose, the most important aspect of this sequence is the conversion of nitrate to its active form- nitric oxide- in the presence of a sulfhydryl source.**



**Adverse Effects**

**Headache**

**Orthostatic Hypotension**

**Reflex Tachycardia**

**Drug Interactions**

**Hypotensive Drugs**

**Beta Blockers, Verapamil, and Diltiazem**

**Sildenafil**

**Other Organic Nitrates**

**Isosorbide Dinitrate, Isodorbide Mononitrate, Erythrityl Tetranitrate, Pentaerythritol Tetranitrate**

**All of these nitrates have pharmacologic actions identical to those of nitroglycerin.**

**All are used for angina, all are taken orally, and all produce headache, hypertension, and reflex tachycardia.**

**Differences among them relate only to route of administration and time course of action.**