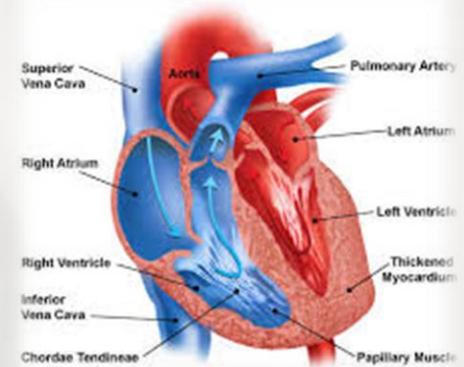


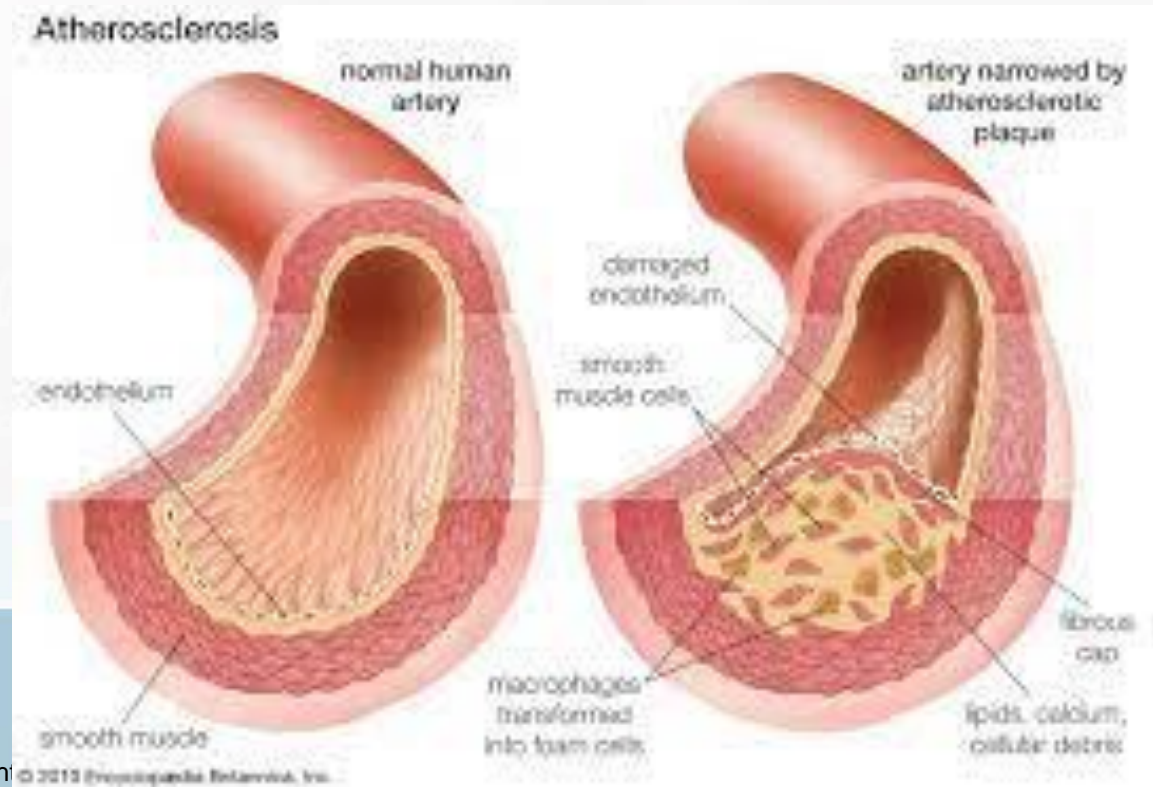
Introduction to Clinical Pharmacology

Chapter 35 Antianginal and Vasodilating Drugs



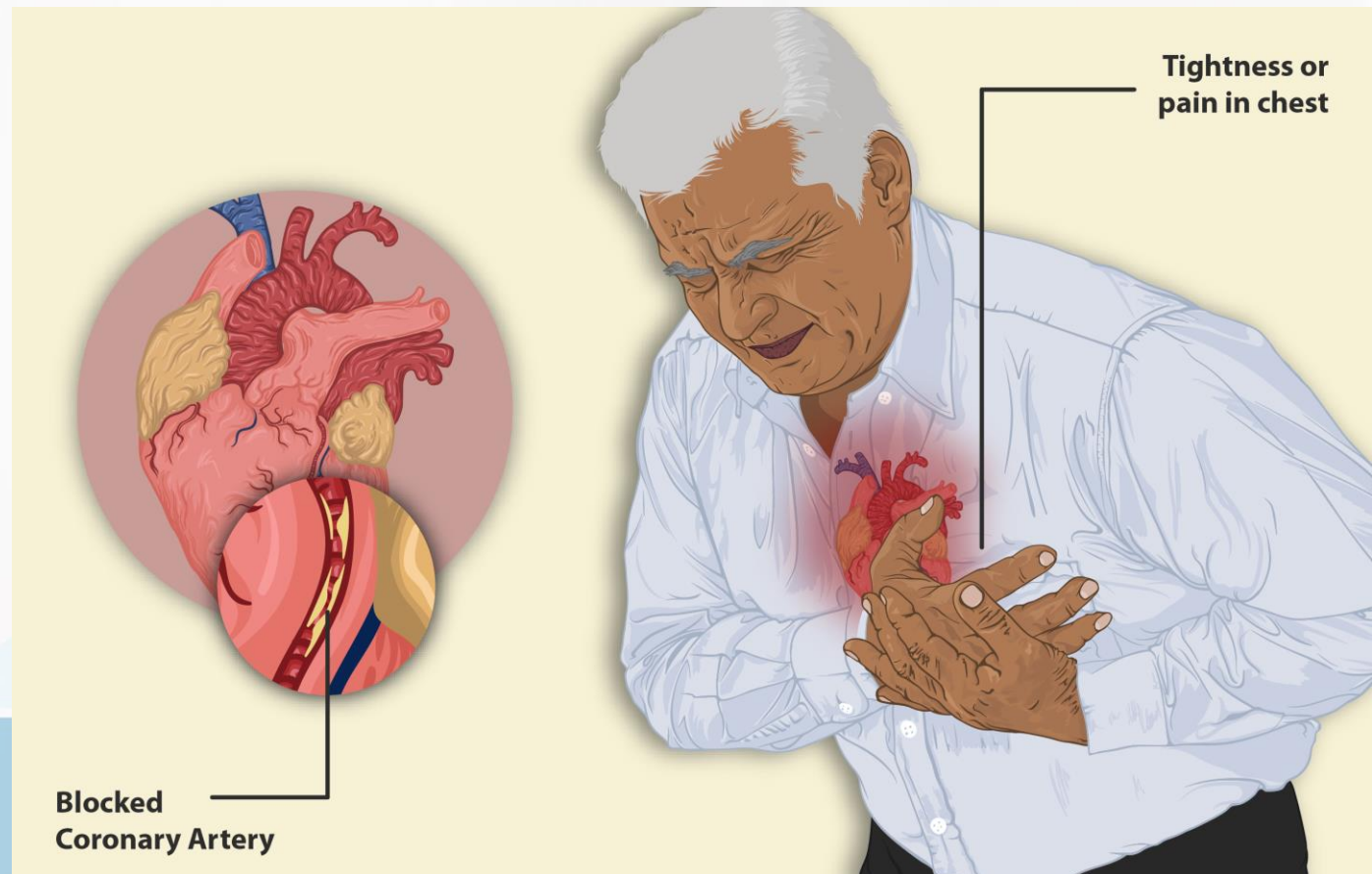
Key Definitions

- **Atherosclerosis:** disease characterized by deposits of fatty plaques on the inner walls of arteries



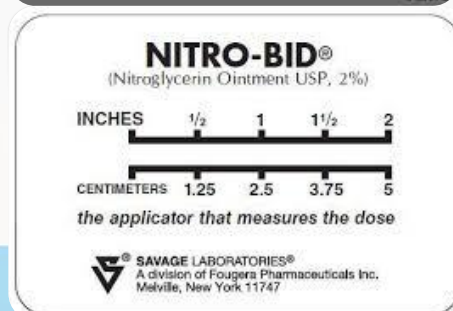
Key Definitions

- **Angina:** acute pain in the chest resulting from decreased blood supply to the heart muscle



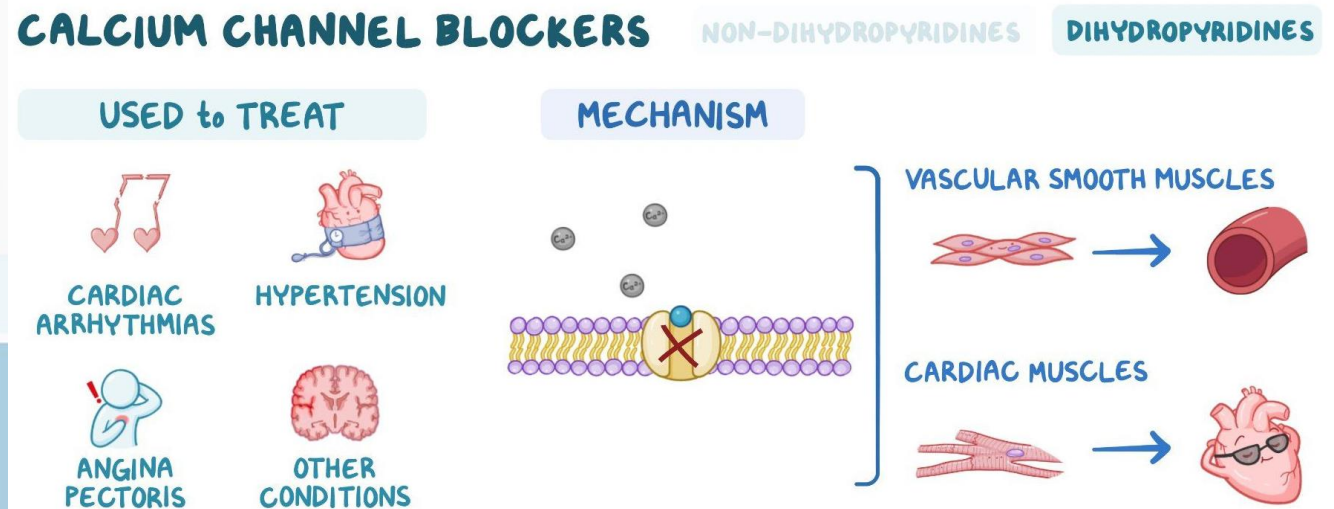
Antianginal Drugs: Actions

- Nitrates: act by relaxing the smooth muscle layer of blood vessels, increasing the lumen of the artery or arteriole, and increasing the amount of blood flowing through the vessels



Antianginal Drugs: Actions

- Calcium channel blockers: act by inhibiting the movement of calcium ions across cell membranes of cardiac and arterial muscle cells; effects on the heart: slowing the conduction velocity of the cardiac impulse; depression of myocardial contractility; dilating coronary arteries and arterioles



Antianginal Drugs: Uses

- Nitrates: relieve pain of acute anginal attack; prevent angina attacks; treat chronic stable angina pectoris
- Calcium channel blocker: anginal pain associated with certain forms of angina, such as vasospastic angina; chronic stable angina; hypertension



Antianginal Drugs: Adverse Reactions #1

- Nitrates:
 - CNS reactions: headache (may be severe and persistent), dizziness, weakness, and restlessness
 - Other body system reactions: hypotension, flushing, and rash
- Calcium channel blockers:
 - CNS reactions: dizziness, lightheadedness, headache, nervousness, asthenia (loss of muscular strength), and fatigue

Antianginal Drugs: Adverse Reactions #2

- Calcium channel blockers (cont.)
 - Gastrointestinal reactions: nausea, constipation, and abdominal discomfort
 - Cardiovascular reactions: peripheral edema, hypotension, arrhythmias, and bradycardia
 - Other body system reactions: rash, flushing, nasal congestion, and cough



Antianginal Drugs: Contraindications and Precautions #1

- Nitrates:
 - Contraindicated in patients with known hypersensitivity to the drugs, severe anemia, closed-angle glaucoma, postural hypertension, early myocardial infarction (MI), head trauma, cerebral hemorrhage (may increase intracranial hemorrhage), allergy to adhesive (transdermal system), or constrictive pericarditis; amyl nitrite: pregnancy

Antianginal Drugs: Contraindications and Precautions #2

- Nitrates (cont.)
 - Precautions: in patients with severe hepatic or renal disease, severe head trauma, acute MI, and hypothyroidism; during pregnancy and lactation
- Calcium channel blockers:
 - Contraindicated: patients who are hypersensitive to the drug; with sick sinus syndrome; with second- or third-degree atrioventricular (AV) block; with hypotension (systolic pressure less than 90 mm Hg); with ventricular dysfunction; with cardiogenic shock

Antianginal Drugs: Contraindications, Precautions, and Interactions

- Calcium channels blockers (cont.)
 - Precautions: in patients with congestive heart failure, hypotension, renal impairment, and hepatic impairment; during pregnancy and lactation
- Interactions:
 - Nitrate interacts with alcohol—severe hypotension and cardiovascular collapse may occur; aspirin—increased nitrate plasma concentrations and action may occur; calcium channel blockers—increased symptomatic orthostatic hypotension; dihydroergotamine—increased risk of hypertension and decreased antianginal effect; heparin—decreased effect of heparin

Antianginal Drugs: Interactions

- Interactions (cont.)
 - Calcium channel blockers interact with cimetidine or ranitidine—increased effects of calcium channel blockers; theophylline—increased pharmacologic and toxic effects of theophylline; St. John's wort—reduced serum concentrations of calcium channel blocker, e.g., nifedipine; digoxin—increased risk for digitalis toxicity; rifampin—decreased effect of calcium channel blocker

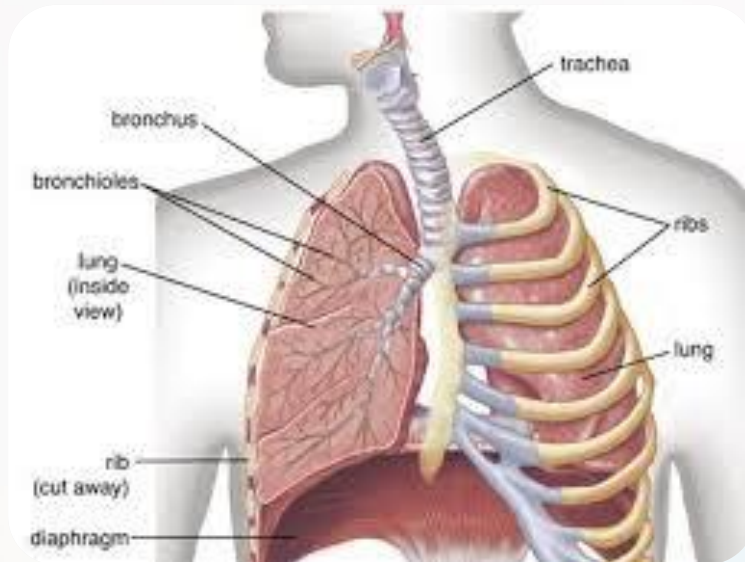
Nursing Process: Assessment #1

- Preadministration assessment:
 - Before administering an antianginal drug: obtain and record a thorough description of the patient's anginal pain as well as a history of allergy to the nitrates or calcium channel blockers and of other disease processes that would contraindicate administration of the drug



Nursing Process: Assessment #1

- Assess the physical appearance of the patient, auscultate the lungs for adventitious sounds, and obtain a baseline ECG and vital signs



Nursing Process: Assessment #2

- Ongoing assessment:
 - Monitor the patient for the frequency and severity of any episodes of anginal pain; report to the primary health care provider any chest pain that does not respond to three doses of nitroglycerin given every 5 minutes for 15 minutes; take the patient's vital signs before administration and frequently during administration; assess patients receiving the calcium channel blockers for signs of CHF: dyspnea, weight gain, peripheral edema, abnormal lung sounds (crackles/rales), and jugular vein distention

Nursing Process: Diagnosis

- **Risk for Injury** related to hypotension, dizziness, lightheadedness
- **Pain** related to narrowing of peripheral arteries, decreased blood supply to the extremities

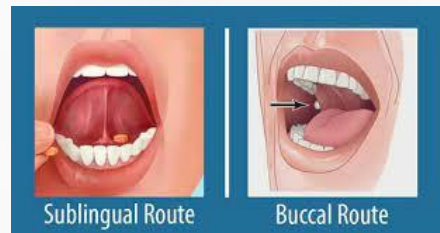


Nursing Process: Planning

- Expected outcomes for the patient depend on the specific reason for administration of an antianginal drug but may include:
 - Optimal response to drug therapy
 - Meeting of patient needs related to the management of common adverse drug reactions
 - Understanding of the postdischarge drug regimen

Nursing Process: Implementation #1

- Promoting an optimal response to therapy:
 - Nitrates administered by the sublingual (under the tongue), buccal (between the cheek and gum), oral, IV, or transdermal route; nitroglycerin administered by the sublingual, buccal, topical, transdermal, oral, or IV route; if the buccal form of nitroglycerin prescribed, instruct the patient to place the buccal tablet between the cheek and gum or between the upper lip and gum above the incisors and allow it to dissolve



Nursing Process: Implementation #2

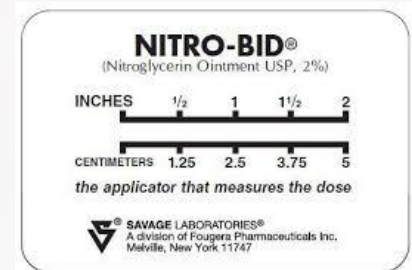
- Promoting an optimal response to therapy (cont.)
 - Nitrates (cont.): nitroglycerin also administered by a metered spray canister to abort an acute anginal attack; instruct the patient to call the nurse if pain not relieved in three doses
 - Administering topical nitroglycerin: dose measured in inches or millimeters; before measuring and applying the drug obtain patient's blood pressure and pulse rate: compare with baseline and previous vital signs—if blood pressure lower or pulse rate higher, contact primary health care provider before applying

Nursing Process: Implementation #3

- Promoting an optimal response to therapy (cont.)

- Nitrates

- Administering topical nitroglycerin (cont.): applicator paper supplied with drug; one paper per application; express the prescribed amount of ointment onto paper while holding the paper; remove paper from previous administration and cleanse area; rotate application sites to prevent inflammation of skin



Nursing Process: Implementation #4

- Promoting an optimal response to therapy (cont.)
 - Nitrates (cont.)
 - Administering transdermal nitroglycerin: convenient and easier to use; drug absorbed through skin; has the drug impregnated in a pad; tolerance to vascular and anginal effects of nitrates—patients taking higher dosages: prescribed longer-acting products; on dosing schedules



Nursing Process: Implementation #5

- Promoting an optimal response to therapy (cont.)
 - Nitrates (cont.)
 - Administering transdermal nitroglycerin (cont.): patients using patches prone to tolerance—nitroglycerin released at constant rate, steady plasma concentration maintained; when applying transdermal system; inspect skin site—dry, free of hair, and not subject to excessive rubbing or movement; discuss the nursing interventions when applying transdermal system on the patient

Nursing Process: Implementation #6

- Promoting an optimal response to therapy (cont.)
 - Nitrates (cont.)
 - Administering oral nitroglycerin: available as tablet that is swallowed; provide to patient on empty stomach, unless ordered otherwise; if nausea occurs after administration, notify the health care provider; taking tablet or capsule with food may be ordered to relieve nausea; due to tolerance primary health care provider may prescribe short-acting two to three times per day until 7 p.m. and long-acting twice daily

Nursing Process: Implementation #7

- Promoting an optimal response to therapy (cont.)
 - Nitrates (cont.)
 - Administering IV nitroglycerin: administered diluted in normal saline solution or in water by continuous infusion using infusion pump to ensure rate; by using glass IV bottles and sets provided by manufacturer; regulate dosage according to patient's response and as per primary health care provider's instruction



Nursing Process: Implementation #8

- Promoting an optimal response to therapy (cont.)
 - Calcium channel blockers: taken without regard to meals, unless GI upset occurs, then give with meals; verapamil and bepridil cause gastric upset, hence taken with meals; verapamil tablets opened and sprinkled on foods or mixed in liquids; patient with difficulty swallowing diltiazem: tablets crushed and mixed with food or liquid

Nursing Process: Implementation #9

- Monitoring and managing patient needs:
 - Risk for injury: assist patient having episodes of postural hypotension with all ambulatory activities; instruct the patient to take the drug in the sitting or supine position and keep the position until symptoms disappear; monitor blood pressure frequently in patient with dizziness and lightheadedness
 - Pain: evaluate response to therapy by questioning about anginal pains; pain: relieved entirely, less intense or frequent, or occurs with prolonged exercise; record information on patient's chart—helps in future therapy and making dosage adjustments

Nursing Process: Implementation #10

- Educating the patient and family:
 - Patient and family should have a thorough understanding of treatment of chest pains with an antianginal drug; explain the therapeutic regimen to the patient; adapt the teaching plan to the type of antianginal drug prescribed



Nursing Process: Evaluation

- The therapeutic effect is achieved and pain is relieved
- Adverse reactions are identified, reported to the primary health care provider, and managed successfully through nursing interventions
- The patient verbalizes an understanding of the treatment modalities
- The patient and family demonstrate an understanding of the drug regimen