

ANTI –ANGINAL DRUG

1) Defination: Angina is managed by using drug that improve perfusion of the myocardium or reduce its metabolic demand or both.

Angina Pectoris: Angina pectoris (or chest pain) is a symptom experienced due to myocardial ischemia ,where in the blood supply to the heart decrease.

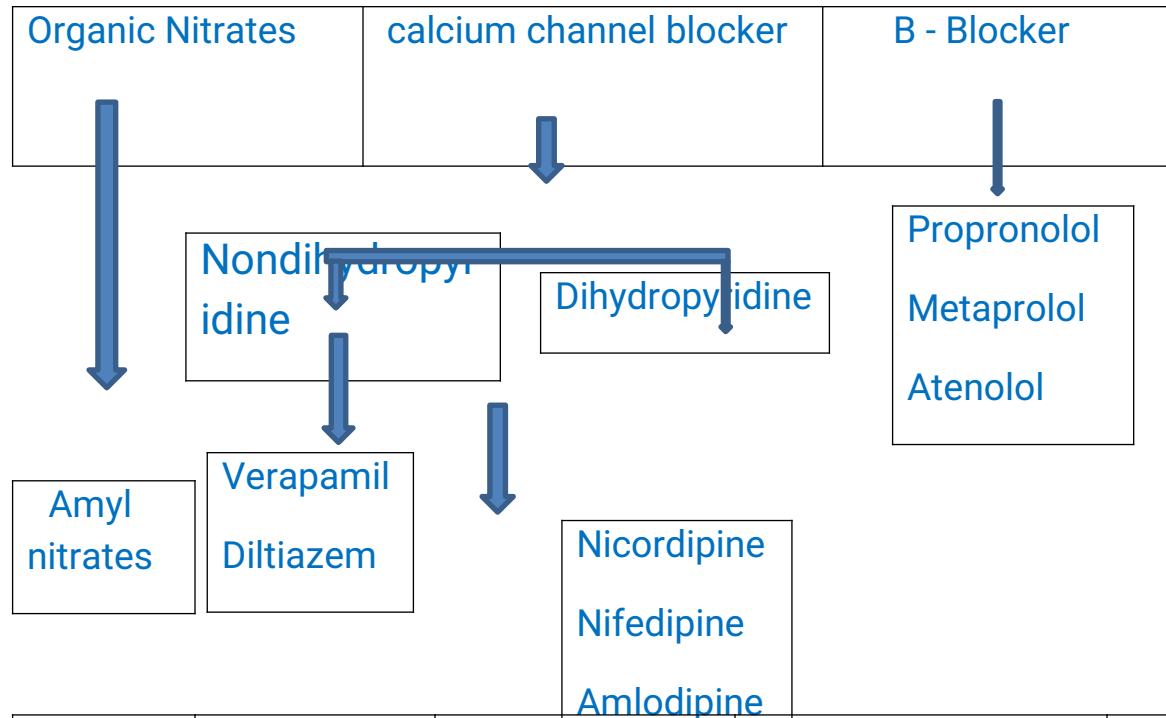
2) Sign and symptoms of angina pectoris:[a] Chest pain or discomfort, often described as squeezing pressure fullness ,tightness,or a heavy weight in the center of the chest.[b]Pain or discomfort in the arms, neck,jaw,shoulder,or back.[c]Pain similar to indigestion and heart burn.[d]Shortness of breath and tiredness.[e] Nausea, sweating , and dizziness.

3) Diagnostic test:1]Electrocardiogram (ECG)2 Chest X-Ray .3]Chest CT angiography .4]Cardiac MRI .5] Coronary angiography. 6] Echocardiogram or stress test.

4) Non-pharmacology treatment . 1) Stop-smoking. 2) Reduce intake of bad fats and sugar. 3) Exercise regularly. 4) Work towards a healthier body weight.

5]Pharmacological treatment : Antianginal drug recommended for the initial treatment are beta blocker and calcium blocker which reduce myocardial ischemia by heart rate reduction and vasodilatory mechanism respectively.

Anti – anginal classification



Class	Agent	M.O.A	Pharmacological of action	Therapeutics uses
Organic nitrates	Amyl nitrates	Amyl nitrates antianginal action is thought to be the result of a reduction in systemic and pulmonary arterial	-It is potent vasodilator. - It expands B.P - Organic nitrate direct relaxant effect on vascular smooth	1] Amyl nitrite is related to the nitrate medicines and is used by inhalation to relieve the pain of angina attacks. 2] it works by relaxing blood vessels and icreasing the supply of blood and oxygen to the heart while reducing its workload.

		pressure {afterload}and decreased cardiac output because of peripheral vasodialation, rather than coronary artery dilation.	muscles.	
Calcium channel blocker.	Verapamil.	Verapamil inhibits the calcium ion influx through slow channels into conductile and contractile myocardial cells and vascular smooth muscle cells.	It work by relaxing Blood vessels and also.increas blood supply O2 to heart rate.	1]verapamil is used to-treat high blood pressure and to control angina 2]The immediate relase tablet are also used alone or with other medications to prevent and treat irregular hearbeats.
B- Blocker	propranolol	Mechanism of action competitively blocks both B1 and B2 adrenergic receptors. When access to B-	This drug works by blocking the action of certain natural chemicals in your body that affect the heart and blood vessels this effects reduces heart	1]propranol is used to treat tremors ,angina chest pain, hypertension heart rhythm disorders and other heart or circulatory conditions. 2]it is also used to treat or prevent heart attack and to reduce the severity and frequency of migraine headaches.

		receptor sites is blocked by propranolol HCL the chronotropic ,inotropic and vasodilator responses to beta –adrenergic stimulation are decreased proportionately.	rates blood pressure and strain on the heart.	
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REFERENCE: 1]Rang and dale's[pharmacology] P.G[206]. 2]Goodman and Gilmans manual of Pharmacology and therapeutics P.G [8553] ,3]Pharmacology and pharmaco therapeutics , 4] Rang and dale'S P.G [253]

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DEPARTMENT :- Pharmacology ,**TOPIC :-**Anti angina ,

CLASS :- T. Y.B – pharm.

ACADEMIC YEAR- 2021-22

Antihypertensive Drug

Antihypertensive are those class of drugs that are used to treat hypertension

- **HYPERTENSION**

A condition in which the force of the blood against artery walls is too high

- **BLOOD PRESSURE STAGES**

STAGES	SYSTOLIC mmHg	DIASTOLIC mmHg
Stage 1	Less than 130	Less than 80
Stage 2	Between 130-159	Between 80-89
Stage 3	Between 140-159	Between 90-99
Stage 4	160 or high	100 or high

- **SIGNS AND SYMPTOMS**

SIGNS	SYMPTOMS	CAUSES
Signs headache	Cough	Smoking
Shortness of breath	Hypotension	Stress
Anxiety	Migraine	Alcohol consumption
Nose bleeds	Constipation	Older age

- **DIAGNOSIS**

- By checking your blood pressure
- Sphygmomanometer
- Aneroid meter
- Oscillometer

- **TREATMENT**

- A. Non pharmacological treatment

1. Exercise, Weight reduction
2. Healthy life style, Reduction in salt intake

B. Pharmacological treatment : 1. Drug therapy

A. CLASSIFICATION :

1. ACE inhibitors

e.g. captopril, Lisinopril, Enalapril

3. Angiotensin-II receptor antagonist.

e.g. losartan, valsartan

5. beta blockers

e.g. Prazosine, terazosin.

7. beta- alpha adrenergic blockers.

e.g. labetalol, carvedilol.

9. central sympatholytics

e.g. clonidine, methyldopa.

2. Beta blockers

e.g. propranolol, Atenolol, Timolol.

4. Calcium channel blocker-

e.g. verapamil, amlodipine

6. Diuretics

e.g. furosemide, hydrochlorothiazide

8. Vasodilator

e.g. minoxidil, diazoxide

10. miscellaneous

e.g. methyldopa, hydralazine HCL

DRUGS	EXAMPLES	MECHANISM OF ACTION	PHARMACOLOGICAL ACTION	DOSE	USES	SIDE EFFECTS
ACE inhibitors	lisinopril	Increase Vasodilation of smooth muscle	Lower bp By reducing peripheral vascular resistance	10-40 mg	Used in hypertension and diabetic neuropathy	Dry cough

Angiotensin II receptor antagonist	losartan	Block the AT1 receptor decrease activation of AT1	Produce arteriolar and venous dilation	25-100 mg	Renal hypertension	Headache, back pain , fatigue
Beta blockers	propanolol	Decrease b.p. ,sympathetic outflow from CNS ,seceration of aldosteron	Blocking action of epinephrine	25-100 mg	Reduction of cardio vascular morbidity	Diziness, weakness
Alpha blocker	prazosine	Decrease peripheral vascular resistance and decrease atrial pressure	Produce competative block of alpha 1 adrenorecept or	1-16 mg	Improve lipid profile	Slight drowsiness
Calcium channel blocker	varapmil	prevent ca+2 from entering cells of heart and artery	By blocking ca+2 allow blood vessel to relax	2.5-10 mg	Improve renal function	constipation
diuretics	furosemide	Decrease blood volume and blood pressure	Increase urine output by kidney	2.5-5 mg	Treat systolic hypertension	Dehydration , joint disorders
Centrally acting	methyldopa	Induce peripheral sympatho inhibition ,decrease b.p.	Decrease central adrenergic tone	500 - 200 mg	Hypertension in pregnancy	Slow heart rate,headache, fatigue fever

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2. Pharmacology and pharmatherapeutics ,R.S.satoskar ,S.D.bhandarkar 15th edition pg. 379 and 25th edition page no. 444
3. Goodman and Gillmans ,Joel G. Hardman, LEE E. Limbird 10th edition pg. no.871-900

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CLASS - Third year B Pharm

ACADEMIC YEAR - 2021-2022

PHARMACOLOGICAL ACTION OF CHF

Drug used in CHF(Chronic Heart failure)

Definition-CHF is a clinical syndrome in which the heart is unable to pump enough blood to the body to meet its needs to dispose of systemic or pulmonary venous returned adequately or a combination of the two.

Sign & Symptoms-

- Shortness of breath with activity or when laying down.
- Fatigue and weakness
- Swelling in the legs ankles and feet
- Rapid or irregular heart beat
- Reduced ability to exercise
- Nausea and lack of appetite
- Chest pain if heart failure is caused by a heart attack

Diagnostic tests for CHF

- Chest X-Ray
- Blood Test=U & Es , creatinine , FBC, TFTS, Glucose & Lipid
- Urine Analysis
- ECG
- CT SCAN
- MRI

PHARMACOLOGICAL ACTION OF CHF

Non pharmacological Treatment

Compliance =

Give careful advice about disease , treatment and self help strategies

Diet =

Ensure adequate general nutrition and ,in obese patients ,weight reduction

Salt =

Advice patients to avoid salt content foods and not to add salt

Fluid =

Urge overload patients and those with severe **CHF** to restrict their fluid intake

Alcohol =

Advice moderate alcohol consumption

Smoking =

Avoid smoking (adverse effect on coronary disease ,adverse hemodynamic effect

Exercise =

Regular exercise should be encouraged

Vaccination =

Patients should consider influenza and pneumococcal vaccination

PHARMACOLOGICAL ACTION OF CHF

Pharmacological Treatment of CHF

Classification Of CHF

1) Drugs with positive inotropic effect

Cardiac glycosides	Digoxin, Digitoxin, ouabain
Bipyridines	Amrinone and Milrinone
B adrenergic agonist	Dobutamine and dopamine

2) Drugs without positive inotropic effect

Diuretics	Thiazide, furosemide, spiranolactone, bumetanide, hydrochlorothiazide
Angiotensin antagonist (1) ACE Inhibitors (2) Angiotensin receptor blockers	Captopril, Enalapril, Fosinopril, Ramipril Losartan, candesartan, Telmisartan
Beta adrenergic antagonists	Atenolol, carvedilol, Metoprolol, Bisoprolol
Vasodilators	Isosorbide dinitrate, nitrates, glyceryl trinitrate
Arteriolar dilators	Hydralazine, minoxidil, potassium channel blockers, calcium channel blockers

PHARMACOLOGICAL ACTION OF CHF

Drug	Pharmacological Action	M.O.A	Adverse Effect	Contraindication	Dose
Nitroglycerin	1) Vasodilators 2) Reduction in sympathetic activity	It converts to nitric oxide in the body NO then activates the enzyme guanylyl cyclase which converts GTP to c-GMP in vascular smooth muscle and other tissue	Dizziness, Weakness, Vertigo, Headache Electrolyte imbalance, Thrombocytopenia	Digitalis toxicity, CVS, Recent myocardial infarction, Heart block,	2.6mg
Minoxidil	1) Arterial dilations lowers the B.P 2) It improves blood flow to the brain	It lowers B.P by relaxing vascular smooth muscle through the action	Psychic depression, Headache, Mental Symptoms,	Arrhythmia, Renal impairment, Hepatic failure	10mg
Captopril	1) Prevents the degradation of prostaglandin 2) Treatment for encephalopathy	It blocks the conversion of angiotensinogen-1 to 2 & inhibiting vasoconstriction	Dryness of mouth, Palpitations, Syncope,	Electrolyte imbalance especially hypokalemia	100mg
Prazosin	1) It increases B.P 2) It blocks the alpha-1 adrenoceptor antagonists	It is an alpha-1 blocker which is used to treat high B.P	Vomiting		5mg

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- 2) Clark Jose Aray, Karan Whaten, Lippincott 5th Edition By Reviews Pharmacology,
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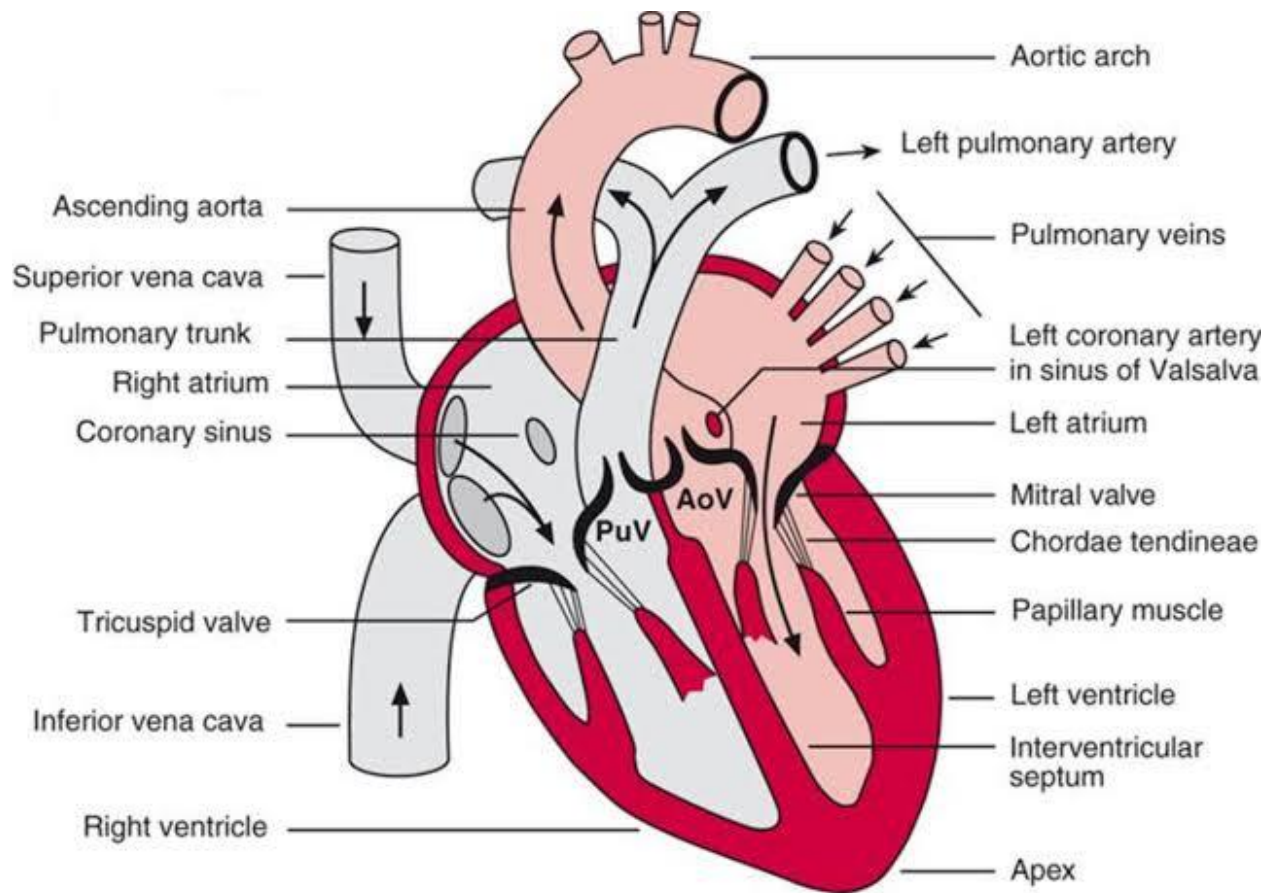
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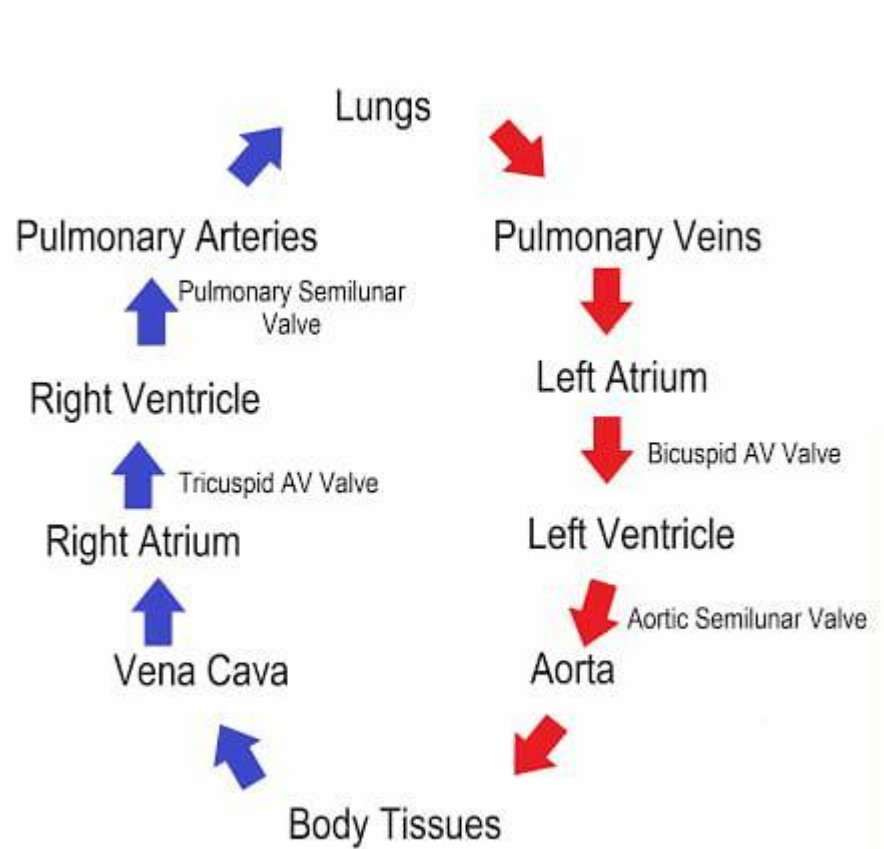
Introduction to Hemodynamic and Electrophysiology of Heart

Hemodynamic of Heart-

Definition-Hemo dynamic- Movement of blood throughout the body

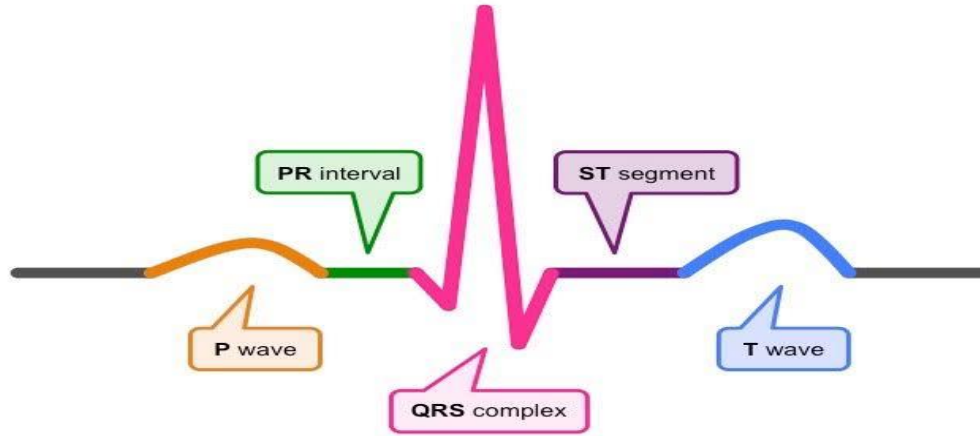
Hemodynamic is a term used to describe the intravascular pressure and flow that occurs during a cardiac cycle.





Electrophysiology of Heart-

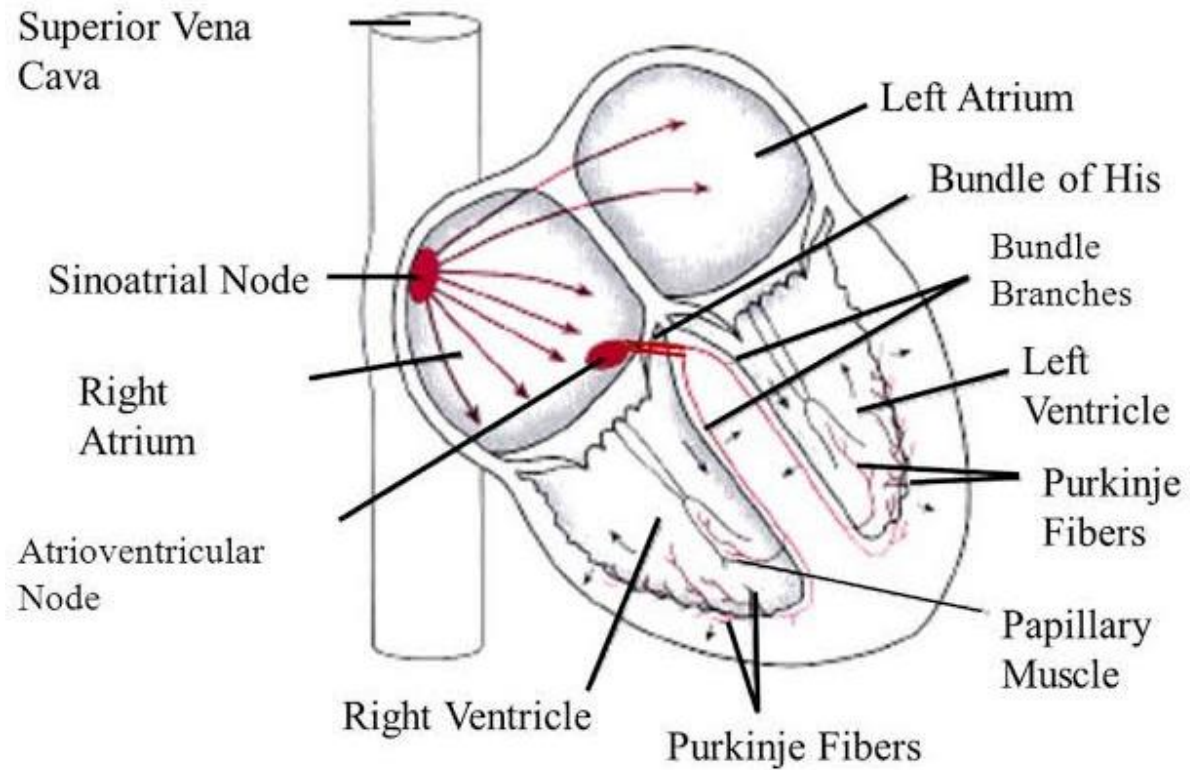
Definition- Cardiac Electrophysiology is the science of elucidating, diagnosing and treating the electrical activities of heart



Normal ECG tracing of a single cardiac cycle-

- **SA node-** Sinoatrial Node
 - Pacemaker of the Heart
 - Generate action potential (electric impulse)
 - Located in wall of right Atrium
- **AV node-** Atrioventricular Node
 - Second pacemaker
 - Located in right side of atrial wall

Basic Cardiac Electrophysiology-



Normal Values-

- **Cardiac Output-** The cardiac output is the amount of blood ejected from each ventricle every minute

Cardiac Output= Stroke volume × Heart rate (L/min)

- **Stroke volume-** Volume of blood in the ventricles immediately before they contract.
- **Blood pressure= 120/80 mmHg**
- **Stroke volume= 70ml**
- **Heart rate= 72/minute**
- **End Diastolic volume (EDV)= 120ml**
- **End Systolic volume (ESV)= 50ml**
- **Ejection fraction= 58%**
- **Heart rate= 75bpm**
- **Cardiac output= 5.25L/minute**

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ANTI-HYPERLIPIDEMICS

DEFINITION : Hyperlipidemia is a medical condition characterized by an increase in one or more of the plasma lipids including triglycerides , cholesterol and phospholipids

SIGNS AND SYMPTOMS :

- Chest pain or pressure (angina)
 - Blockage of blood vessels in brain and heart
 - Stroke
- High blood pressure
Heart attack

DIAGNOSIS : A blood test to check cholesterol levels called a lipid panel or lipid profile

- Total cholesterol
 - LDL cholesterol
- HDL cholesterol
Triglycerides

NON PHARMACOLOGICAL TREATMENT :

- Dietary reduction total and saturated
- Weight loss overweight patients
- Do aerobic exercise
- Avoid alcohol consumption and smoking

PHARMACOLOGICAL TREATMENT:

Durg therapy

Classification

HMG CoA REDUCTASE INHIBITORS (STATINS) :

e.g. Simvastatin , Atorvastatin, Rosuvastatin

NICOTINIC ACID :

e. g. Niacin

FIBRATES :

e. g. Clofibrate, Fenofibrate, gemfirozil

BILE ACID SEQUESTRANTS :

e.g. Colestipol, Colestyramine

CHOLESTEROL ABSORPTION INHIBITORS :

e.g. Ezetimide

Statins: e.g. Lovastatin

Mechanism of action	Pharmacological action	Dose
Slow the production of cholesterol to decrease amount of cholesterol	Decrease triglycerides	10-80 mg
Therapeutic uses	Adverse effects	Contraindications
Used in myocardial infarctions and stroke	Muscle pain, heart pain, constipation	Liver problems, epilepsy

Bile acid binding: e.g. Cholestyramine

Mechanism of action	Pharmacological action	dose
Decrease Enteroheptic absorption of bile salts and decrease absorption cholesterol	Triglycerides generally not affected	4-16 mg

Therapeutic uses	Adverse effects	Contraindications
Hypercholesterolemia and Dyslipidemia	Abdominal pain, loss of appetite	Galls stones, kidney dysfunction

Fibric acid derivatives: e.g. Gemfrozil

Mechanism of action	Pharmacological action	Dose
Increase VLDL clearance by stimulating vascular endothelial cell lipo-protein lipase activity	Decrease triglycerides	1200 mg
Therapeutic uses	Adverse effects	Contraindications
Raise HDL, plasma triglycerides	Atrial Fibrillation	Anaemia, gall bladder

Nicotinic acid : e. g. Niacin

Mechanism of action	pharmacological action	Dose
Fatty acid released from adipose tissue by inhibiting the Intracellular lipase system	Decrease triglycerides	2-16 mg
Therapeutic uses	Adverse effects	Contraindications
All types of Hyperlipidemia	Flushing, dyspepsia	Peptic ulcers, pregnancy

Cholesterol absorption inhibitors : e.g. Ezetimide

Mechanism of action	pharmacological action	Dose
It selectively inhibits intestinal cholesterol absorption	Decrease LDL	10mg

Therapeutic uses	Adverse effects	Contraindications
High blood cholesterol	Abdominal fullness,darkened urine	Renal impairment

REFERENCE

- 1 .Goodman and Gilman- the pharmacological basis of therapeutics page no:972
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