**DT 4th**

**Course Title: General pharmacology II**

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**Discuss various drugs classes used for hypertension and Cardiac heart failure? I . CARDIAC HEART FAILURE:**

Heart failure, sometimes known as congestive heart failure, occurs when your heart muscle doesn't pump blood as well as it should. Certain conditions, such as narrowed arteries in your heart (coronary artery disease) or high blood pressure, gradually leave your heart too weak or stiff to fill and pump efficiently

**DRUG USES IN CARDIAC HEART FAILURE:**

Following are the drug uses in cardiac heart failure:

1. **DRUG THAT INCREASE MYOCARDICAL INFRACTION FORCE**
2. **CARDIC GLYCOSIDES:**

**DRUGS:**

* Digoxin (Lanoxin)
* Digitioxin (Digitaline)

**ADRS:**

* Gastrointestinal symptoms
* Visual disturbances
* CNS effects
* Cardiac effects

1. **PHOSPHODIAESTERS INHIBITORS:**

**DRUGS:**

* Inamrinon
* Milrinone

1. **DOPAMINE AND DOBUATAMINE:**

beta-1 agonists epinephrine, prenalterol, etc.

1. **DRUG THAT DECREASE CARDIC HEART FAILURE:**

**ANGEOTENSIN-CONVERTING ENZYME (ACE) INHIBTOR:**

ACE inhibitors prevent your body from forming angiotensin. Angiotensin is a hormone that causes your blood vessels to constrict or get smaller, which increases your blood pressure. Lower angiotensin levels, then, help widen your blood vessels and let your blood flow more easily. This reduces your blood pressure.

Your doctor may prescribe an ACE inhibitor if you have high blood pressure or heart failure. They may also prescribe one after you’ve had a heart attack. These drugs can help your heart muscle recover from the lack of oxygen during the attack. They can also help prevent another heart attack.

**DRUGS:**

* Captopril (Capoten)
* Enalapril (Vasotec)
* Fosinopril (Monopril)
* Lisinopril (Prinivil, Zestril)

1. **ANGIEOTENSIN II RECEPTOR BLOCKER(ARBs)**

ARBs block the effects of angiotensin on your heart. This effect lowers your blood pressure. Your doctor may prescribe an ARB if you have high blood pressure or congestive heart failure. Like ACE inhibitors, ARBs can help you recover after a heart attack.

**DRUGS:**

* [losartan](https://www.healthline.com/health/losartan/oral-tablet) (Cozaar)
* olmesartan (Benicar)
* valsartan (Diovan)

**ADRS:**

* skin rashes
* gastrointestinal discomfort, and dizziness.
* Some patients taking ACE inhibitors develop a persistent dry cough

1. **BETA-BLOCKER:**

Beta-blockers are a broad category of medications used to treat different problems from heart disease. In general, beta-blockers work by blocking the actions of certain chemicals that stimulate your heart, such as epinephrine (adrenaline). This allows the heart to beat more slowly and less forcefully.

Your doctor may prescribe a beta-blocker to help prevent a first heart attack as well as repeat heart attacks. They may also prescribe one if you have high blood pressure, heart failure, chest pain, or an arrhythmia

**DRUGS:**

* metoprolol (Lopressor)
* labetalol (Trandate)
* [propranolol](https://www.healthline.com/health/propranolol/oral-tablet) (Inderal)

1. **DIURETICS:**

Diuretics work by inhibiting the reabsorption of sodium from the nephron, which, in turn, decreases the amount of water that is normally reabsorbed with sodium, thus increasing water excretion. This effect reduces congestion caused by fluids retained in the body and decreases cardiac preload by excreting excess fluid in the vascular system. **DRUGS:**

* Furosemide
* Thiazide diuretics
* Spironolactone
* Eplerenone

**ADRS:**

* Volume depletion
* Hyponatremia
* Hypokalemia
* altered pH balance

1. **VASODIALATION:**

Produces vasodilation by blocking alpha-1 receptors on vascular smooth muscle. these vasodilators work by different mechanisms, they all can decrease cardiac workload by decreasing peripheral vascular resistance

**DRUGS:**

* Prazosin
* Hydralazine
* organic nitrates (e.g., nitroglycerin,isosorbide dinitrate, sodium nitroprusside)   
  **ADRS:**
* headache
* dizziness
* hypotension
* rthostatic hypotension

II. **HYPERTENSION:**

Hypertension (HTN or HT), also known as high blood pressure (HBP), is a long-term medical condition in which the blood pressure in the arteries is persistently elevated.

**DRUGS USES IN HYPERTENSION:**

Following are the drugs that used in hypertension:

* 1. **DIURETICS:**

Diuretics are a class of drugs that increase the flow of urine (termed diuresis).

**MECHANISM OF ACTION:**

*Act on V-2 receptor in kidneys (vasopressin* receptor) having an antediuretic function---- leads  to diuresis----increased secretion of Na & H2O  decrease in blood volume ----decreased CO--- decreased BP

**DRUGS:**

* **Thiazides:** Furosemide
* **Loop diuretics:** chlorthalidone
* **K+ sparing diuretics** :Spironolactone

**ADRS:**

* Dizziness
* Electrolyte
* imbalance/depletion
* hypokalemia
* hyperlipidemia
* hyperglycemia
  1. **SYMPOLYTIC DRUG:**

**CENTRAL SYMPOLYTICS:**

**SITE OF ACTION:**

CNS medullary ,cardiovascular centers

**MECHANISM OF ACTION:**

CNS a-2 adrenergic stimulation---- autoinhibitoryfeedback mechanism---- decreased

sympathetic outflow----decreased norepinephrine release----vasodilatation---- decreased PR---- decreased BP.

**Drugs:**

* Clonidine
* methyldopa

**ADRS:**

* Dry mouth
* Sedation
* Drowsiness
* Nasal congestion

**SYMPOLYTIC DRUGS:**

**SITE OF ACTION:**

peripheral arterioles, smooth muscle

**MECHANISM OF ACTION:**

Blocks a-1 receptor(in post synaptic neurone as well as in vascular smooth muscles)---- cause vasodialatation due to relaxation of vascular smooth muscles---- decreased PR----also reduces preload by pooling of blood----decreased CO ---- decreased BP.

***DRUGS:***

* Prazocin
* Terazocin

**ADRS:**

* Nausea
* Drowsiness
* Postural
  1. **VASODILATOR:**

**MECHANISM OF ACTION:**

Releases NO ----stimulation of guanylyl cyclase---- more conversion of GTP to cGMP-----activate protein kinase------- myosin phosphorylation & combination with actin inhibited----relaxation of vascular inhibit \*MLCK phosphorylation-smooth muscles

* **DRUGS:**  
  **Arteriolar** – Hydralazine
* **Arterio-venular:** Sodium Nitroprusside

**ADRS:**

* Nausea.
* Vomiting.
* Flushing.
* Headache.
* Excessive hair growth.

**CALCIUM CHANNEL BLOCKERS:**

**SITE OF ACTION:**  
 Vascular smooth muscle K+, Ca+, Na+

**MECHANISM OF ACTON:**

Blocks long acting voltage sensitive calcium channels

**DRUGS:**

* nifedipine
* diltiazem
* amlodipine
* :felodipine

**ADRS:**

* Flushing
* Headache
* Achycardia
* peripheral oedema gastroesophageal reflux