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COURSE	B. Pharm
COURSE DURATION	4 Years
SUB TOPIC NAME	Drugs used in Congestive Heart Failure
CONTENT TYPE	Text
SEARCH KEY WORD	Digoxin, Digitoxin

A handwritten signature in blue ink, appearing to read "Rafael", with a horizontal line underneath.

(CONTENTCREATOR/TEACHER)

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Part-2

• Drugs used in Congestive Heart failure! -

→ Digoxin Congestive Heart failure! -

Congestive heart failure [CHF] is a chronic progressive condition that affects the pumping power of your heart muscles, which is simply referred as "heart failure".

CHF specifically refers as not a disease actually a syndrome, that means a stage in which fluid builds up around the heart and causes it to pump inefficiently.

→ Digoxin and Digitoxin! -

- **Digoxin!** - It is a cardiac glycosides, It is derivative of digitalis derived from *Digitalis purpurea* (common foxglove).

M.O.A →

Cardiac glycosides increases intracellular Ca^{2+} concentration.

It is the result of 2 step process.

first, inhibit Na^+/K^+ pump by binding on K^+ -binding site Na^+/K^+ ATPase on the cell membrane which causes a rise in intracellular sodium.

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Secondly, a rise in intracellular sodium can slow down the extrusion of Calcium by a $\text{Na}^+/\text{Ca}^{2+}$ exchange mechanism,

↑ Used Cytoplasmic Calcium is transported to sarcoplasmic reticulum, finally increased the amount of Ca^{2+} released by the action potential.

• Uses :-

It is widely used in treatment of various heart conditions namely atrial fibrillation, atrial flutter and sometimes heart failure that can't be controlled by other medication.

⇒ Digitoxin :-

It is a phytosteroid and is similar in structure and effects to digoxin.

It is rarely prescribed in used over digoxin.

• M.O.A →

Digitoxin inhibits the $\text{Na}^+/\text{K}^+/\text{ATPase}$ membrane pump resulting is an increase in intracellular sodium and Calcium concentration.

- Increased intracellular concentrations of Calcium may promote activation of contractile proteins. (e.g - actin, myosin).

Digitoxin also acts on the electrical activity of Heart -
 increasing the slope of phase 4 depolarisation,
 shortening the action potential duration and decreasing
 the maximal diastolic potential.

• Uses :-

It is clinically rarely used in treatment of CHF,
 atrial flutter, atrial tachycardia, and atrial
 fibrillation.

→ **Nesiritide** :-

M.O.A →

Its action is based on works by facilitating cardio-
 vascular homeostasis through the negative regulation
 of the renin angiotensin aldosterone system. This
 regulation will in order stimulate cyclic guanosine
 monophosphate (cGMP) and smooth muscle cell
 relaxation.

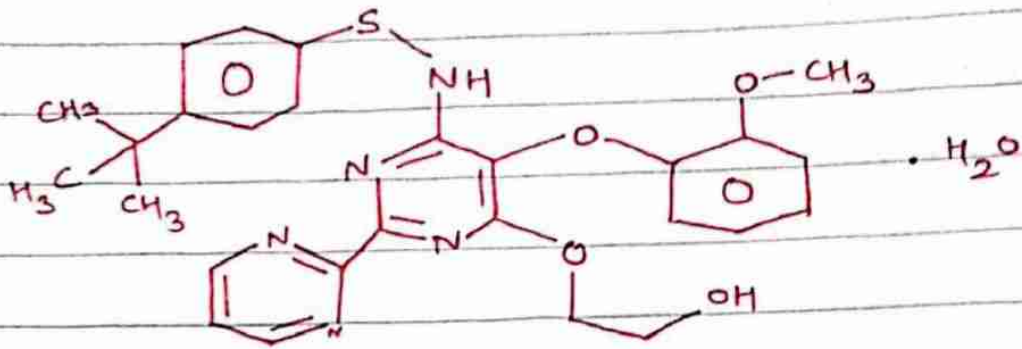
In simple terms, it promotes vasodilation, natriuresis
 and diuresis.

• Uses :-

Nesiritide is used to improve breathing in people
 with congestive heart failure.

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⇒ Bosentan :-



• M.O.A →

It is competitive antagonist of endothelin-1; blocks endothelin receptors on vascular endothelium and smooth muscle resulting in inhibition of vasoconstriction.

• Uses →

It is clinically used to treat pulmonary arterial hypertension [CPAH] high blood pressure.

⇒ Tezosentan :-

• M.O.A →

It is non-selective endothelin A and B receptor antagonist. It acts as a vasodilator and causes smooth muscle relaxation to inhibit the vasoconstriction.

• Uses :-

It is clinically used for patients treatment suffering with acute heart failure conditions.

REFERENCES :-

→ Patel M Harun and Jain Anurekha, "Text-book of Medicinal chemistry", 1st edition, 2014 published by CBS publishers & distributors. pvt. Ltd.

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