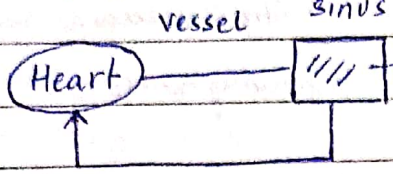
CIRCULATORY & EXCRETORY SYSTEM

Date .....

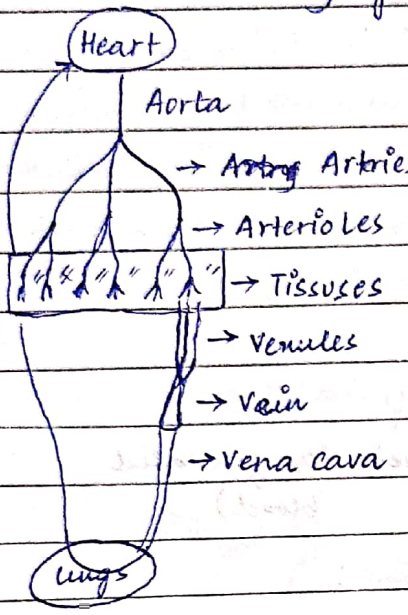
open & closed circulatory system :-

- Open circulatory system



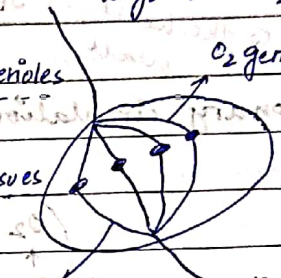
- No capilleries
- Arthropods & Mollusca except cephalopods & tunicalis.

- closed circulatory system



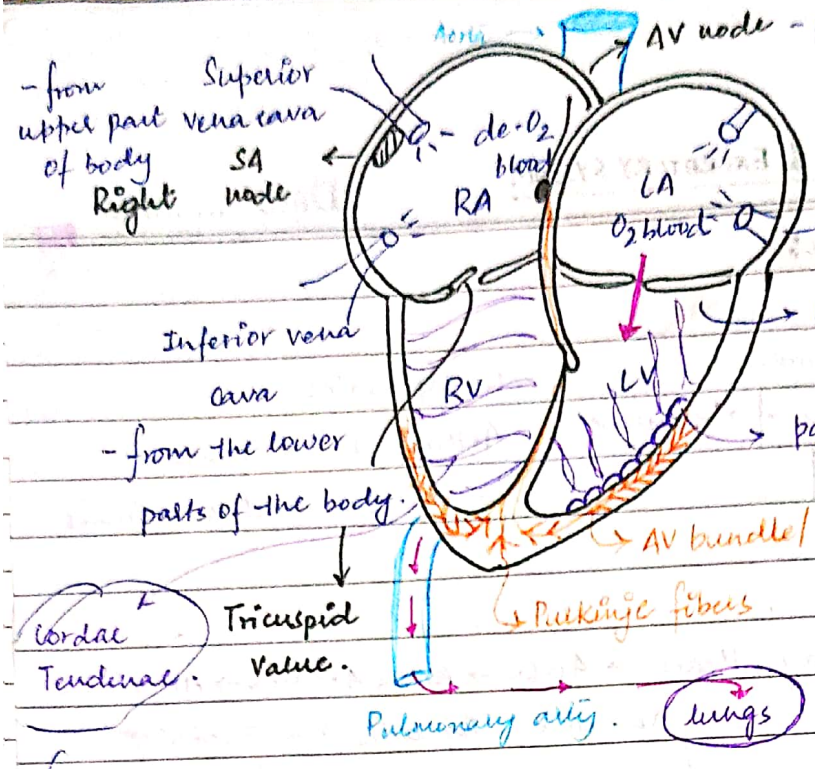
- pathway : Heart → Aorta → ~~Arties~~ Arteries → Arterioles → Capilleries → Tissues → Venules → Vein → Vena cava → Heart.

(oxygen Tissues ko leya aur CO_2 de diya).



• open circulatory system	close circulatory system
1) Blood pressure - low	1) Blood pressure - higher than OCS.
2) Blood directly conveyed to the organs without the formation of capillaries.	2) Blood conveyed to the organ through capillaries.
3) Distribution of blood is not well regulated.	3) Distribution is well regulated.
4) Blood return to the heart slowly.	4) Blood return to the heart rapidly.
5) Founds in most arthropods & mollusca expects - tunicalis & cephalopods.	5) Tunicales, cephalopods & all Vertebrales.

Spiral

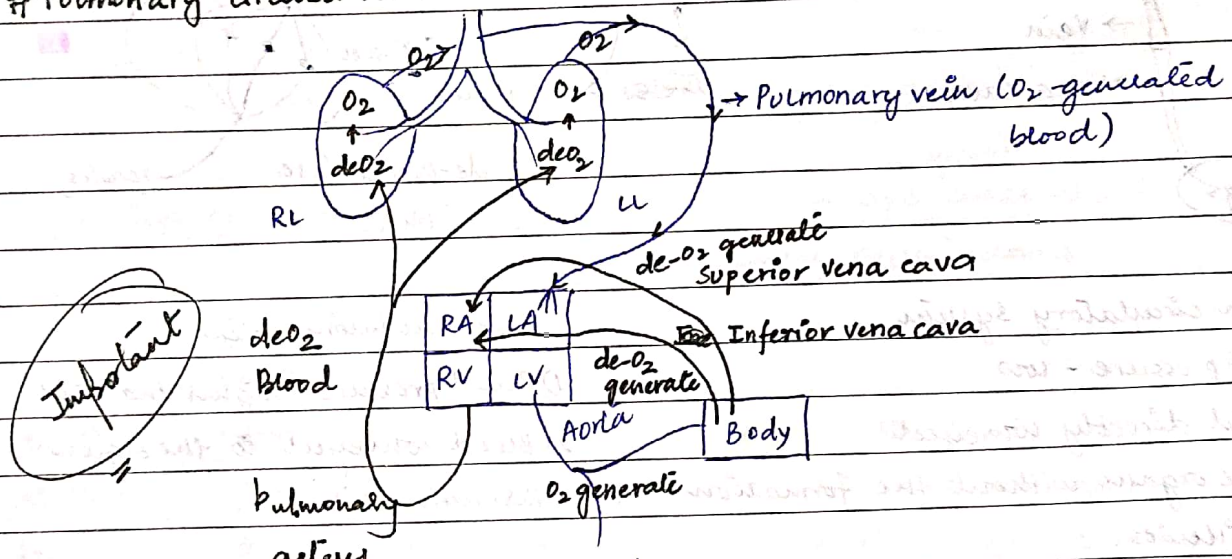


It will connect the atrioventricular value to the heart wall.

Date .....

Structure of human's heart

Pulmonary circulation :-

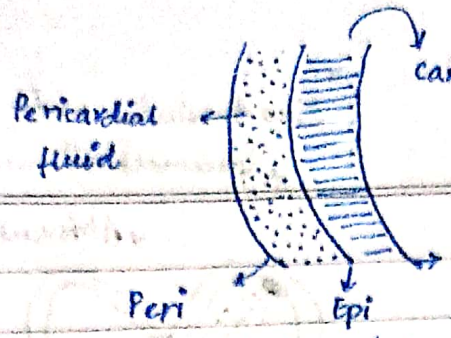


- Largest artery - Aorta
- " vein - Vena cava
- Vein carries O_2 - Pulmonary vein
- vein " de-O_2 - " artery.

Circulatory system in humans:-

- closed circulatory system.
- 4. chambred heart
- Myogenic heart
- contains 3 walls
  1. pericardium
  2. Epicardium
  3. Endocardium

Spiral

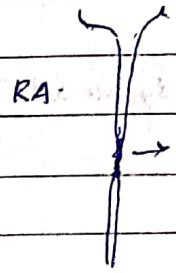


- Fibrous layer (rigid)
- Maintain the position of heart & protect the heart.

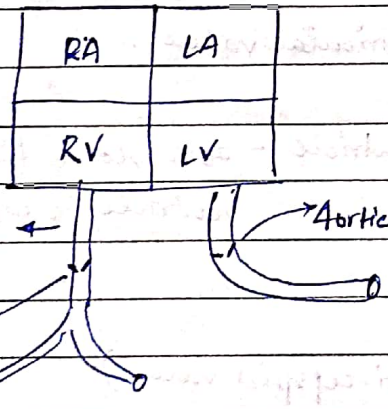
↳ - The fluid behaves as "shock absorber" & lubricant.

- Origin → Mesodermal in origin.
- ≈12 cm length & 9cm width.
- Located behind sternum & 1st ⅔ oblique & tilted towards the left.
- Atrium - thin walled & ventricle - thick walled.
- An Groove is 1st b/w Atrium & ventricle called "coronary sulcus".
- An Groove is 1st in ventricle - Posterior interventricular sulcus.
  - Anterior " "

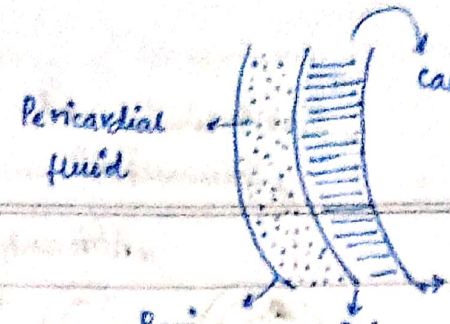
⇒ In this grooves coronary arteries are 1st & will supply blood to heart.



Represents the remenents of "foramen ovale."



Spiral



→ Directly contact Dakshlond.....

- Fibrous layer (rigid)
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- Atrium - thin walled & ventricle - thick walled.
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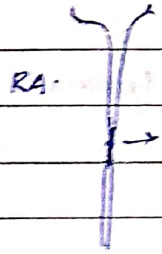
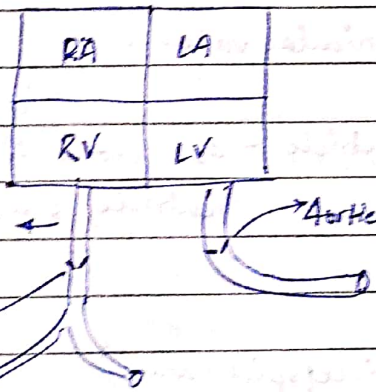
- An Groove is cut in ventricle - Posterior interventricular sulcus.
  - Anterior " "

⇒ In this grooves coronary arteries are cut & will supply blood to heart.



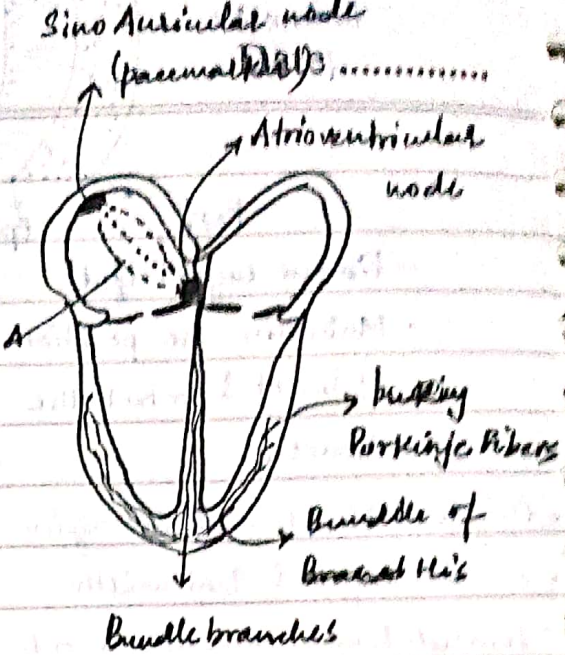
Represents the remnants of "foramen ovale."



Spiral

Pumping action of heart :-

- rythemic contraction & Relaxation action.
  (systol) (Diastol)



- SA node (pacemaker of heart)
  - 3.5 mm muscle strip.
  - SA node have self exitatory ability
  - SA node has rich in Na^+ channels.
    - ↳ when change in memb. potential then an action potential development.

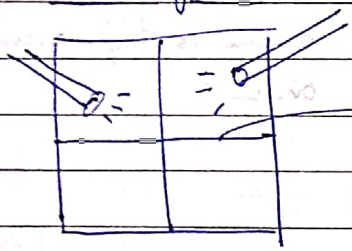
→ SA → Internodal fibres → AV → Bundle branches → B. of Hi's → P. fibres.

Cardiac cycle :-

Begining of one heart beat to the begining of next heart beat.

Cardiac cycle ⇒ Systole & Diastole of both atria & ventricle.

① Atrial systole :-



① filling of atrium
② open atrio ventricular value.
③ filling of ventricle :- 70% blood filling in the ventricle is w/o contraction

② Ventricular contraction

closing of A-V septum (Bi & tri-cuspid value)

↓

creates an sound - (lub)

Speral

opening of semi-lunar value

Blood → • lungs
Blood → • body

Date .....

Pressure of ventricle ↓

↓

Semi lunar value closed ⇒ Prevent the back flow of blood to the heart

↓↓

creates a Sound = (Dub)

↓

Atrial Systole

:

Course of circulation : ① System - Blood vessels b/w heart to lungs is known as as pulmonary circulary System.

② System - Blood vessels b/w heart to the body known as systemic circulation → Coronary artery

③ Coronary circulation : Aorta · Artery, (Heart)

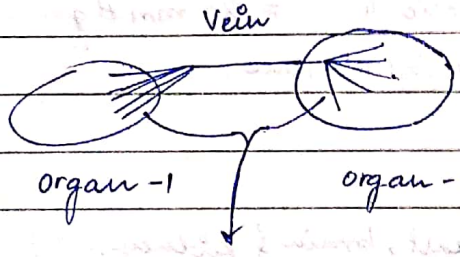
(RA) ← dCO_2

diff b/w Artery & Vein

Vein layer = Tunica intima - Endothelial cells.
Tunica media - Smooth muscle fibres.
Tunica ~~fibrosa~~ externa - fibrous layer

In Artery this wall is thick whereas in vein is thin.

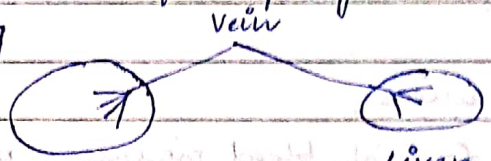
#Portal System :-



Capillary

The System in which vein from an organ divided into capillary again.

e.g



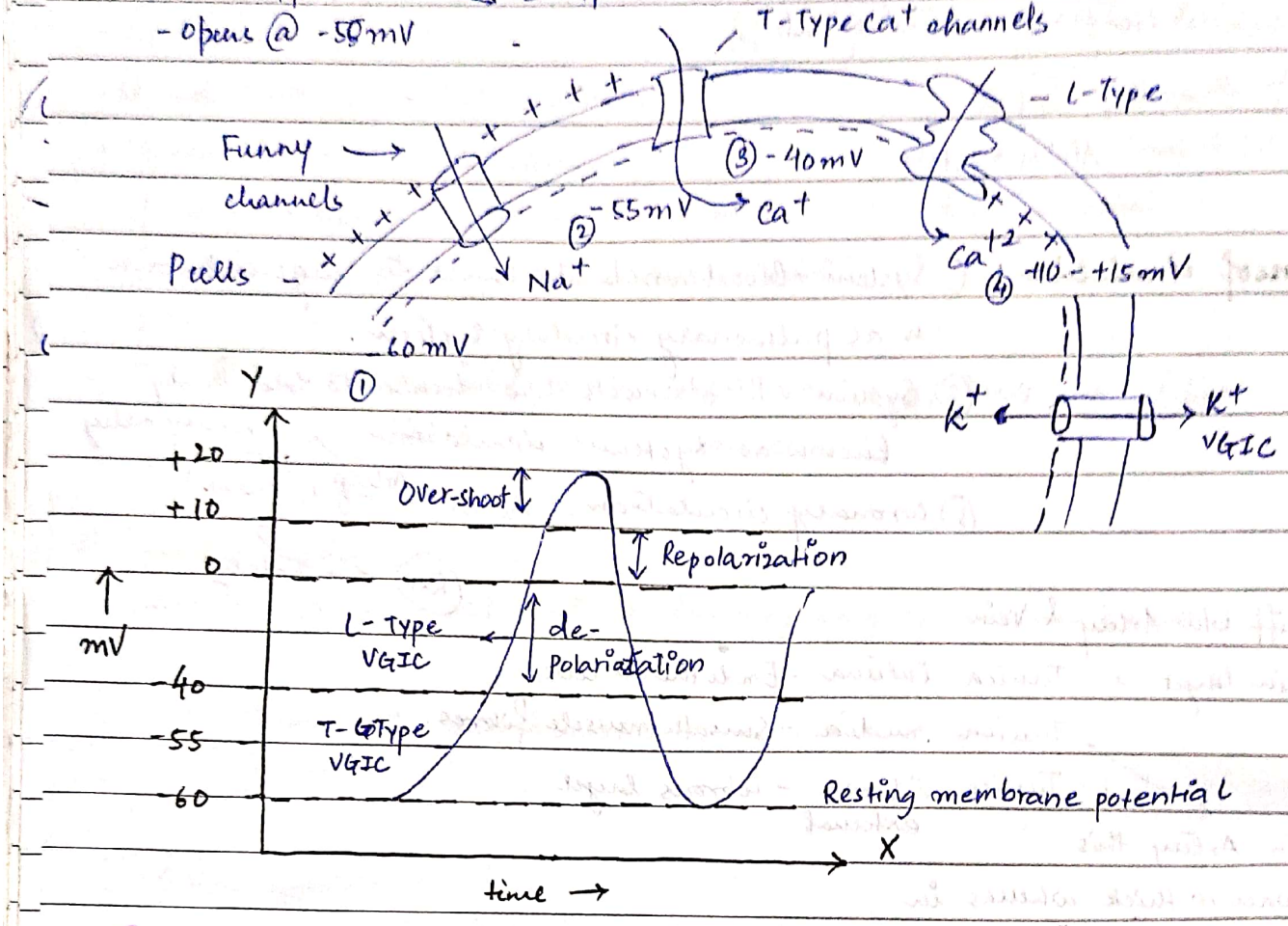
Intestin
- Transport CO_2 & nutrition.

Speral

Date .....

Action potential in SA node :-

- SA node
  - ↳ cells - P-cells are found.
  - ↳ leaky channels / Funny cells - Na^+ leaky channels.
  - ↳ VGIC → for Ca^{+2}, K^+ VGIC
    - T-Type ← → L-Type
    - opens @ -55mV



Disorder :-

1) Hypertension : Atrial systolic pressure = Systolic pressure = 120 mm Hg
   " diastole pressure = Diastolic " = 80 mm Hg
   If these pressure inc-↑ for a long period of time.

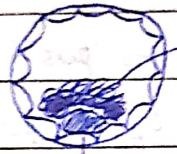
Consequences,
Due to high blood pressure = affected Heart, brain & kidney.

Spiral

Date .....

→ can lead to coronary disease.

2) Atherosclerosis : large / medium sized artery affected.

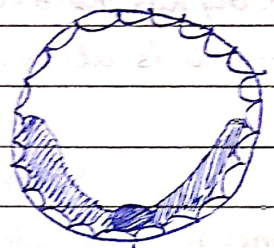


→ fibres, Endothelial & lipid started deposition

cholestrol

Consequences, lumen got narrow & reduced flow of blood & In extreme case completely block the blood supply.

3) Arteriosclerosis: -



Also known as Hardening of artery.

make the artery hard.

Ca^{+2} + cholestrol ⇒ Precipitate & form Plaque.

& loose the property of elasticity & it walls may rupture.

- If these happen in coronary artery - Heart attack & even death.
- BP↑ & Rupture (Thrombosis & clot formation).

DBP:-