Circulatory system in Human

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Circulatory system:-

The flow of fluid in the body is called circulation and the structure concerned with these process is called circulatory system. These system help in balancing of chemical composition and physical state of internal body fluid suppling to the vital needs of the system, makes the internal environment of the body. This is called homeostasis. Circulatory system perform various function in all living organism which are as follow:-

i) It transport oxygen from respiratory surface to the tissue and CO_2 from tissue to respiratory surface.

ii) It transport various metabolic waste product produced in different tissue to the organ from where they are removed out from the body.

iii) It absorb and transport digested food from the site of absorption to the different organ of body for storage, oxidation or synthesis of food stuffs of the body.

iv) It transport chemical messenger like hormones.

v) It regulate temperature by distributing the heat produced in one part of the body to the different part to regulate body temperature.

vi) The circulatory fluid like blood contain phagocytic leucocytes that engulf and kill harmful micro organism. Leucocytes also produce anti-body to develop immunity.

Heart is main organ of circulatory system depending upon the mode of contraction. Two types of heart are present:-

i) Neurogenic Heart :-

Neurogenic heart is a type of heart in which contraction of wave takes its origin from nerve cell or group of such cells situated near the heart is called Neurogenic Heart. Heart of annelida and

arthopod is example of Neurogenic Heat.

2) Myogenic Heart:-

Wave of contraction starts in the muscle fibre of heart is called Myogenic Heart. Heart of mollusca and other vertebrates heart is myogenic Heart.

Types of circulation

1) single circulation :-

In this type of circulation blood passes only one time through the heart. Only the oxygenated blood passes through the heart. This type of circulation is found in fish. The heart of fish is cylindrical in structure which receive impure blood at one end and pump out at other end to the gills from where pure blood is directly supplied with tissue so, it is called single-heart circuit.

2) Double circulation :-

In this type of circulation blood passes twice thro-ugh the heart. It is found in amphibia, reptiles, birds and mammals In this type impure blood is collected in right auricle from the different parts of the body through venacava. such impure blood is pumped to the lungs for oxygenation through the pulmonary artery. After oxy genation pure blood is collected from the lungs to the left auricle through pulmona-ry veins. Finally pure blood is pumped to all parts of body through aortic arch. In this way heart receive the blood two times. Once in the form of impure blood and then in the form of pure blood in second time. so, this circulation is called double-heart circuit.

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Structure of human heart:-

1) Location, shape and size:-

Human heart is traingular in shape. It is muscular organ located in thoracic cavity between the lungs. It measures about 12cm in length and 250 gm in weight. It is larger in male then in female

The heart is conical, muscular organ which is enclosed and ~~pected~~ protected by double wall of pericardium. The outer wall is parietal pericardium whereas inner wall is visceural pericardium the cavity between these two pericardium membrane is filled with perica rdial fluid that protect the heart from mechanical injury, shocks and hel p in free movement during heartbeat.

* External structure of human heart:

Human heart is four chamber having, two au ricle and two ventricle. Right auricle and right ventricle collect impu re blood where left auricle and left ventricle are chamber for pure bloo d. Pure blood and Impure blood donot mixed in heart.

2) Auricles (Atria):-

Auricles are thin wall chamber. The left auricle is small er than right auricle. the left auricle and right auricles are externally seperated by vertical inter-auricular groove. Similarly, auricle and ventri cle are externally seperated by auriclo-ventricular sulci. the right auricle receive the impure blood from different parts of the body through superi or venacava and inferior venacava. similarly left auricle receive oxygena ted blood from lungs by pulmonary veins.

Gurukul

ii) Ventricle :-

Ventricle are thick wall chamber. The left ventricle is longer than right ventricle. the right ventricle receive impure blood from right auricle whereas left ventricle receive pure blood from left auricle

iii) Aorta and pulmonary trunk :-

An aorta arise from left auricle and having two parts. They are Ascending aorta and descending aortas. the ascending aorta give rise to three aortic arches : Brachio cephalic, left common carotid. and left common sub clavian. the coronary arteries arise from ascending aorta and supply the blood to heart. the aorta supply pure blood throughout the body.

The pulmonary trunk arise from right ventricle and divides into left and right pulmonary arteries which carry deoxygenated blood to the lungs.

* Internal structure of heart :-

The internal structure of human heart consist of following parts :-

i) Auricle : the auricles are thin wall chamber seprated by inter-auricular septum. the right auricle receive impure blood from the superior vena cava, inferior vena cava and coronary sinus. the opening of inferior vena cava is guarded by eustachian tube whereas the opening of coronary sinus is guarded by coronary valve. the left auricle receive oxygenated blood from the lungs through the opening of pulmonary veins. In the right auricle a oval depression is present called fossa oval that communicates with auricle during embryonic development. But in adults it is present only age of depression.

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(ii) Ventricle:- Ventricle is thick wall chamber seperated by inter-ventricular septum. The left ventricle is longer with thick wall then right ventricle. because left ventricle pumps the blood forcefully to different part of the body. The right ventricle receive impure blood whereas left ventricle receive pure blood. Due to contraction of ventricle the blood is pumped forcefully to different part of the body.

(iii) Bicuspid and Tricuspid valve:-

The auricle and ventricle are seperated by auriculo ventricular septum. each auricle open in to corresponding ventricle through auriculo ventricular aperture. These aperture are guarded by valve which open only in the ventricle and prevent the backflow of blood. The left auriculo ventricular aperture is guarded by bicuspid valve or mitral valve. Similarly right auriculo ventricular aperture is guarded by tricuspid valve. these valve are attach by fibrous cords with papillary muscle of ventricular wall. these papillary muscle are helpful in extension of ventricle wall. It's main function is to hold the valve thus not allowed them to enter the auricle during powerful ventricular contraction.

(iv) Semilunar valve:-

These valve are located at the base of opening of aorta and pulmonary trunk. Each valve is made up of three fold like structure that seems like half moon which is attached to the inner side of arterial wall. These valve prevent the flow of blood from returning back to the ventricle.

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* Origin and conduction of heartbeat:-

The human heart is myogenic type in which heartbeat originated from muscles and regulated by nerves. the heartbeat is control by mass of neuro-muscular tissue called ~~nerve~~ node. It produce electrical impulses. there are two types of nodes present in heart:-

b) Sinu-auricular node (SA-node / pacemaker).

It is located at the wall of right auricle near the opening of superior venacava. SA-node produce wave of contraction that radiate throughout the auricle. these waves are taken by auricular wall that result in contraction of both auricle at the same time. It is also called natural pacemaker because it initiate the heartbeat

bb) Auriculo-ventricular node (AV-node / Pace setter).

It is located near the right auricle at auriculo-venticular septum. It gave rise to special nerve fibre called bundle of his which is present in the inter-ventricular septum. It pass down to the septum to reach the apex and divides into right and left branches called purkinje fibres. Each branches extends through the wall of ventricle on its corresponding side. these fibres form a network that spreads on the entire wall of ventricle. A-V node also produce contraction wave which spread along the bundle of his and purkinje fibre to all around the ventricle so excites the muscles of ventricle for the contraction.

Heart - lung → Pulmonary blood circulation
Heart - body organ → Systematic blood circulation

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* Control of Heartbeat :-

The rate of heartbeat is control by nervous system and endocrine system.

P) Nervous system :-

The SA-node receive impulse from the brain by two set of nerve fibre

a) Sympathetic Nerves :-

It stimulates the SA-node and increase the rate of heartbeat.

b) Para sympathetic Nerves :-

It inhibits the SA-node and decrease the rate of heartbeat.

c) Hormonal control :-

Two hormones present in adrenal gland - epinephrine and norepinephrine increase the rate of heart beat at the time of emergency. These hormones directly influence the SA-node

Imp 3 marks

* Blood circulation through the heart :-

There are two seperate chamber for oxygenated and de-oxygenated blood. The right auricle and right ventricle collect the de-oxygenated blood whereas left auricle and left ventricle collect the oxygenated blood. There is no any chance of mixing of pure and impure blood. The circulation of blood in the body takes place in following ways :-

i) Circulation begins with right auricle that receive de-oxygenated blood from the body except the lungs. to the main vessels. superior venacava receive the impure blood from head and upper parts of the body whereas inferior venacava receive impure blood from lower parts of body.

ii) Due to contraction of right auricle the impure blood is pumped into right ventricle.

iii) When the right ventricle get contract, the deoxygenated blood is forced through a set of semi lunar valve in the pulmonary artery which carry the blood to the lungs for oxygenation.

iv) When the blood get oxygenated in lungs it return to the left auricle through the right and left pulmonary veins. from there oxygenated blood is passed into left ventricle

v) As the left ventricle get contract, the oxygenated blood is pumped forcefully through the systematic aorta and ~~disturbed~~ distributed to all parts of the body.

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* Working of Heart:-

Human heart is myogenic in which heartbeat initiated from muscles and regulate by nerves the heartbeat is

The action of heart include contraction and relaxation of both auricle and ventricle. The rythemic contraction and relaxation of heart is called heart beat or cardiac cycle. It complete into two stages:-

a) Contraction / systole.
b) Relaxation / Diastole

a) Contraction / Systole:

The contraction and relaxation of different parts of heart take place in definite order. The auricle and ventricle do not contact simultaneously. The auricle contract at first and the ventricle contraction is next. In this way auricle and ventricle contract alternately.

b) Relaxation / Diastole:-

The left auricle receive oxygenated blood from the lungs through the right and left pulmonary veins. Similarly the right auricle receive deoxygenated blood from different parts of the body through three main vessel. Superior venacava receive impure blood from the head, neck and forelimb. Inferior venacava receive impure blood from lower parts of the body whereas coronary sinus collect the impure blood from muscular wall of heart.

After receiving the blood, auricle contract and pass the blood into ventricle. The pure blood pass from left auricle to left ventricle and the impure blood from right auricle to right ventricle. When the auricular contraction is complete the contraction of ventricle occurs. As the left ventricle contract the oxygenated blood is pumped through the aorta to all parts of body. Similarly with the contraction of right ventricle the impure blood is pump to the lungs through the pulmonary aorta for purification or oxygenation.

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* Heartbeat :-

The rythemic contraction and relaxation of heart muscle is called Heartbeat. The contraction and relaxation of different parts of heart takes place in definite order. The auricle and ventricle never contract at same time. Auricle contract first which is followed by ventricle contraction. The heart beat is complete in three stages:-

a) Atrial Systole :-

It is the contraction of both auricle when the blood is pass from auricle to ventricle ~~at~~ atrial systole take place. This process last for 0.1 sec.

b) Ventricular systole :-

It is the contraction of both ventricle as result blood is forced into aorta and pulmonary trunk. During this process auricles are releaxed. This process last for 0.3 sec.

c) Joint Distole :-

During this stage both auricle and ventricle are relaxing. This stage is also ~~called~~ called general pause. During this stage blood enters into auricle from various blood vessels. This process last for 0.4 sec.

So that, total time taken for cardiac cycle or heartbeat of an average person at rest is about 70-80 times per minutes.

* control of heartbeat:-

The rate of heartbeat is controlled by ne

* Blood pressure:-

It is a pressure exerted by blood on the wall of blood vessel through which it flows. It is also called arterial blood pressure. It is measured in mercury scale. The blood pressure is divided into two types:-

1) systolic blood pressure:-

In this type of blood pressure the blood exert on the wall of blood vessel at the end of systolic contraction of ventricle. In a healthy, resting adult man it is about 120 mm Hg It is maximum in arteries because the arteries are always stretched. It indicate the force with which the left ventricle pump the blood in aortic arch. It is called higher limit of arterial blood pressure.

2) Systolic blood pressure:-

It is the pressure, the blood exert on wall of artery when the ventricle is relaxed. In a healthy resting adult human it is about 80 mm Hg. It indicates the elasticity of blood vessel. It is called lower limit of arterial blood pressure.

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* Factor affecting blood pressure:-

1) Exercise:- During the physical exercise, blood pressure is slightly increase.

2) During emotion and excitment blood pressure increase.

3) Blood pressure ~~incre~~ immediately increase after taking meal.

4) When the amount of blood decrease blood pressure also decrease.

5) Contraction of arteries and the capillaries increase the blood pressure.

* Problems relating BP.

1) Hypertention:- In this condition, person has high blood pressure of 150/90 mm Hg. The main factors responsible for Hypertention are tention, fear, exercise, obesity, anxiety and other emotional stresses. It is also caused by intake of Cholestrol rich diet, smoking etc.

2) Hypotention:- In this condition, person has low BP of 100/50 mm Hg. The main factors for hypotention are loss of blood by hemorrhage and failure of pumping action of heart.

3) Pulse:- The wave of distention felt in arteral wall due to contraction of left ventricle. The pulse rate increase during exercise, fever, emotional and physcological ~~development~~ excitment. The arterial pulse can be felt by placing a fingertip on the artery near the wrist.

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Heartrate:- The pulse per minute is heart rate. The normal person, it is about 72 times per minute. The heartrate determine cardiac output.

Cardiac cycle:- The contraction and relaxation of different parts of heart in one heart beat is called cardiac cycle. It complete in 0.8 sec.

Cardiac output:- The amount of blood pump out by each ventricle each minute is cardiac output. It is multiplication of heartrate and stroke volume.

Cardiac output = stroke volume x Heartrate
= 70 ml x 72 = 5040 ml
≈ 5 litre.

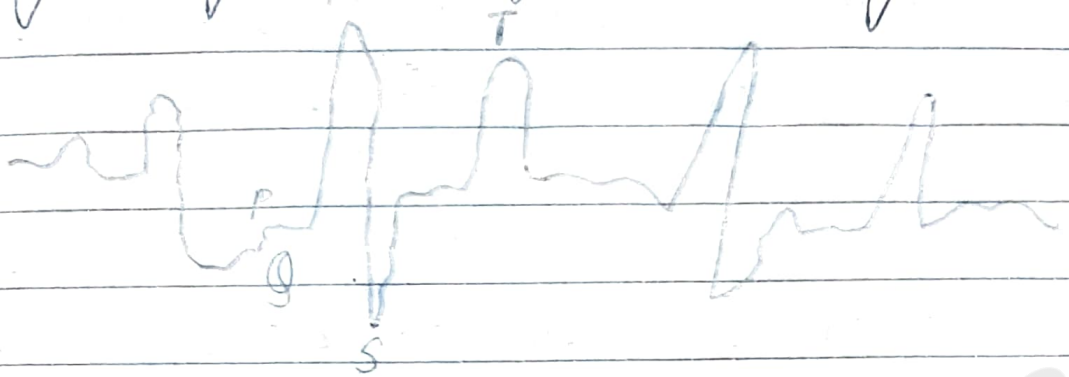
Stroke volume:- It is the volume of blood pumped by ventricle in each heart beat. It is about 70 ml.

Electric cardiac gram (ecg):-

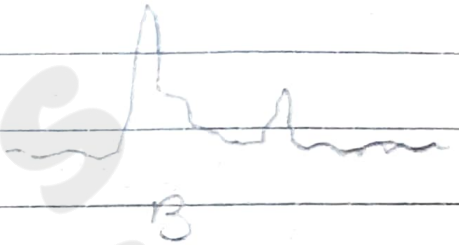
ecg is a graphic record of electrical variation produced by beating of heart. Such method of studying electrical activity of heart is electrocardiography the instrument is discovered by Einthoven (1903).

ecg is recorded by placing metal leads on chest, limbs. The electric current of heart is detected and amplified by machine and transmitted by pen. The cardiang pen draw a wave line called deflection wave (electrocardiogram).

ECG gives accurate information of heart so used as diagnostic tool for determining various heart abo abnormality and give information of heart damage, heart attack etc.



Electrocardiogram Normal



fibrillation.

P → wave indicate auricular contraction.

QRS → Venticular contraction.

T → Venticular relaxation.

* Blood vessels:-

Blood circulate in the body through closed tube like structure called blood vessels. They are of three types:-

a) Arteries:-

Those blood vessel which carry blood away from heart to tissue are called arteries. All artery carry oxygenated blood except pulmonary artery. They contain blood under high pressure so they have thick, muscular and elastic wall with small lumen. They donot have internal valves. They are pink in colour.

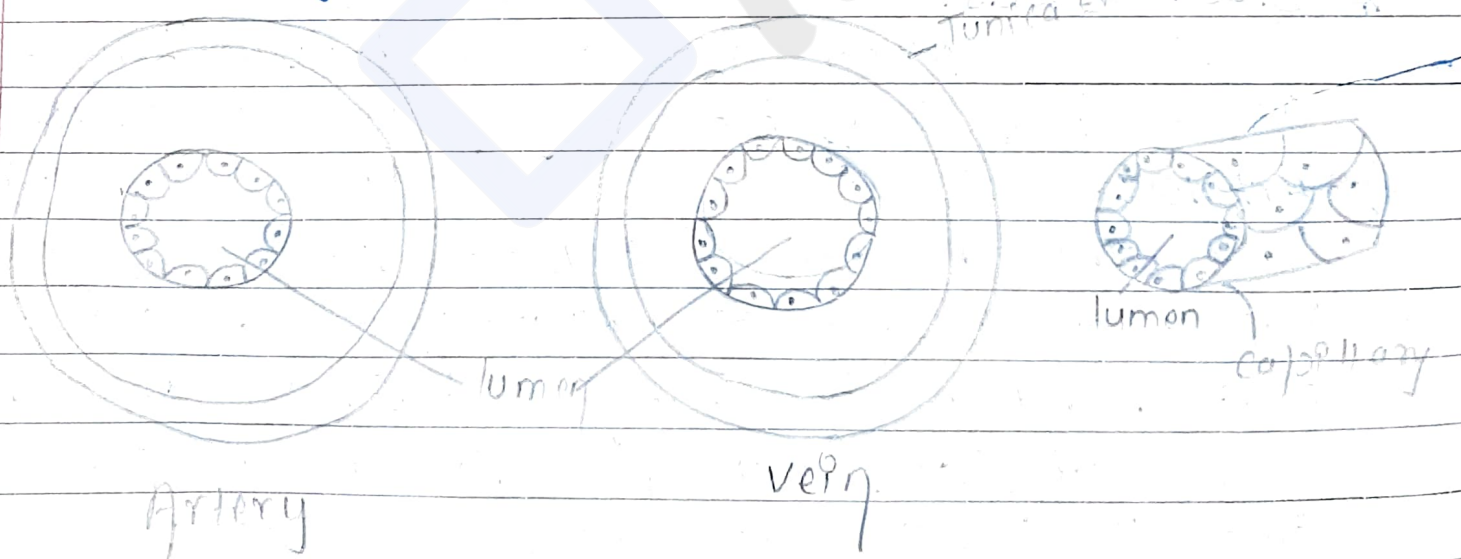
b) Capillaries:-

These are thin walled minute tube forming network. They are composed of single layer of endothelial cells. There wall are so thin so they can exchange food, gas and waste materials. They connect arteries & veins.

c) Veins:-

Those blood vessels which carry blood towards heart from different organ body called veins. All vein carry impure blood except pulmonary vein. They have blood under low pressure. so they are thin walled & collapsable. They are provided with semilunar valve which check back flow of blood. They have large lumen and they are superficially situated. They are dark in color.

* Structure of artery & veins.



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Pace maker:- A small mass of specialized cells found in wall of right auricle near opening of superior venacava is called - pace maker or SA node which initiate and maintain heart beat by rhythmic contraction of heart muscle.

Artificial pacemaker:-

When natural pacemaker is deffected or diseased heartbeat become irregular and so artificial pace maker is used. It generates heartbeat under normal rate. It was 1st ~~implanted~~ implanted by chardack in 1960.

It is an electronic device which generate pulse with electrodes. The pulse generate is ~~set~~ sealed box. contai -n lithium halide cell to generate electrical ~~circuit~~ impulses fo -r more than 10 years. The electric circuit regulate heartbeat rate. The electrode is fine metallic string which is connected to pulse generator and inferior part of heart where impulse to be transmitted. It is placed under collar bone in the upper part of thoracic region by simple operation. It can be replaced or re- ove easily.

Differentiate between SA node & AV node.

Differentiate between Artery and veins.

Arterial blood circulation:-

Those blood vessels which carry blood from heart to different part of body are called arteries. All arteries carry pure blood except pulmonary arteries. Arrangement of arteries in body is called arterial system. This system is formed by Aorta. Arteries and Arterioles.

The arterial system includes two types of circulation:-

a) Pulmonary Circulation.
b) Systematic Circulation.

a) **Pulmonary Circulation:-** The circulation of blood between heart and lung is pulmonary circulation for this superior venacava and inferior venacava collect impure blood from up perand lower part of body and pour into right auricle. When auricle completely filled then heart contract and blood goes to ventrical. After forceful contraction of ventrical, blood is pumped to pulmonary aorta of lungs for purification. The pulmonary aorta divide into two branches:-

- Left pulmonary artery carry deoxygenated blood to left lung
- Right pulmonary artery carry deoxygenated blood to right lung.

) **Systemic Circulation:-** Circulation of blood between heart to blood organs except lungs is called systemic circulation. After contraction of left auricle, blood pass to left ventricle by bicuspid valve and ventricle contract forcefully, Blood is pumped to systemic aorta. Aorta distributes blood to various

parts of body through arteries and arterioles.

As the aorta emerges from heart, it give off two coronary arteries that supply blood to heart muscles.

The aortic arch give three branches that supply blood to upper or region of heart.

These branches are:-

1) Right Brachiocephalic artery.
2) Left common carotid artery.
3) Sub clavian artery.

(1) Right Brachiocephalic artery:-

It is the 1st branch arise from right side of aorta. It supply blood to head, neck and fore limb by two branches.

(a) Right Common Carotid:- It run upward along with trachea and supply blood to the right part of head by two branches.

- External carotid artery:- supply blood to right side of head and face.
- Internal carotid artery:- supply blood to brain, eye, nose & fore head.

(b) Right subclavian artery:- It supply blood to right part of neck and forearm with the help of right vertebral artery, Right axillary artery and Right branchial artery. These artery supply blood to neck, scapular and arm region respectively.

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(2) Left common carotid artery:- It is the second and middle branch of aortic arch. It distribute blood to the right part of head. It is divided into left external carotid and left internal carotid which supply blood to the left side of head and face.

(3) Left subclavian artery:- It is the 3rd branch arise from left side of aortic arch. It supply blood to the left arm. It gave rise to vertebral artery for neck, axillary artery for left shoulder and bronchial artery for lower part of arms.

The aortic arch bend downward and supply blood to the posterior part of body with the help of following major arteries:-

(a) Inferior phrenic artery:- supply blood to lower surface of diaphragm.

(b) Coeliac artery:- supply blood to stomach & liver.

(c) Superior mesenteric artery:- supply blood to various part of small intestine and proximal half of layer intenstine such as caecum & colon.

(d) Renal artery:- It supply blood to kidney.

(e) Suprarenal artery:- It sopply blood to adrenal gland.

(f) Genital artery:- It supply blood to artery (in female) and to testis (in male).

(g) Lumbar artery:- It supply blood to posterior body wall and Vertebrae of posterior abdominal cavity.

(h) Inferior mesenteric artery:- It supply blood to parts of large intestine.

(i) Common iliac artery:- It supply blood to leg.

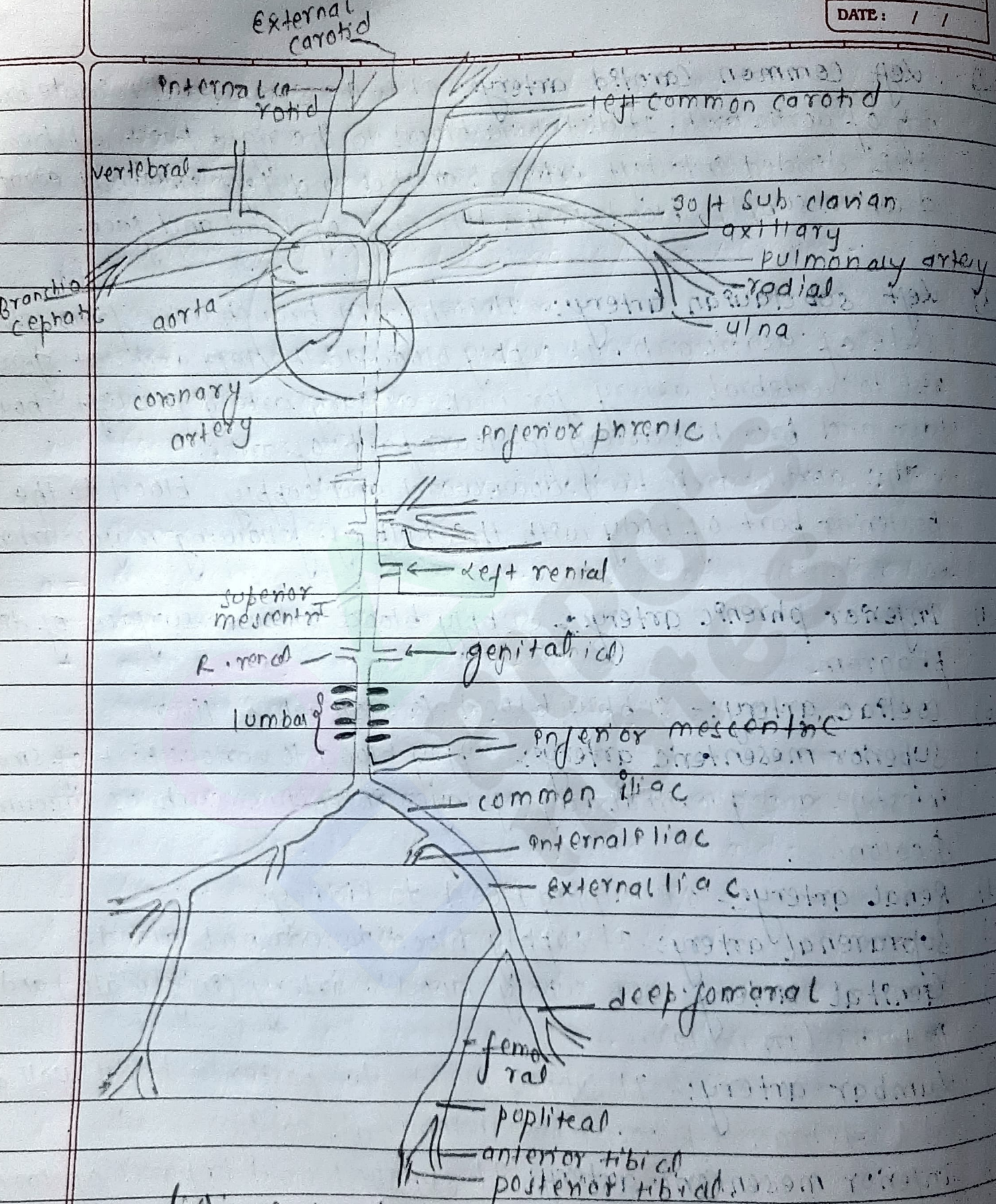

fig - Arterial system

Venous Blood circulat

Venous Blood circulation

The arrangement of vein in body is called venous system. Veins are those blood vessels which carry blood towards heart from different body part. All vein carry impure blood from various parts of body except pulmonary vein. Human heart receive pulmonary veins, coronary vein and caval vein. The following are principal veins in human body.

A) Blood returning from lungs

It is the circulation from lungs to heart. Two pulmonary veins from each lung collect deoxygenated blood.

- Left pulmonary vein collect oxygenated blood from lung to left auricle.
- Right pulmonary vein collect oxygenated blood from right lung to left auricle.

B) Venous blood returning from different parts of body:

The impure blood is collect into right auricle from different part of body through two venacava.

a) Venous blood from superior venacava:

superior venacava collect deoxygenated blood from anterior region and open into right auricles. superior venacava is formed by union of two veins

- Right Brachiocaphalic vein.
- Left Brachio caphalic vein.

Each brachilo cephalic vein is formed by union of three veins.

- External jugular vein: It collect blood from mouth, face and buccal cavity.

- Internal jugular vein :- It collect blood from brain, eye and ear.
- Subclavian vein : It collect blood from shoulder and limbs with help of axillary vein and cephalic vein.

b) Venous blood collected through inferior venacava :-

Inferior vendcava collects the deoxygenated blood from posterior parts of body and open into right auricle. It is formed by following major veins.

(a) Common iliac veins :-

Each common iliac vein on each side is formed by Union of two veins.

i) – External iliac vein : It collect blood from outerside of leg and parts of pelvis.

– Internal iliac vein : It collect blood from rectum, ureter, urinary bladder, uterus, vagina, penis, prostate gland, seminal vesicle.

ii)

i) Lumbar veins : It collect blood from lumbar region.

iii) Krential veins : It collect blood from Gonads.

iv) Renal veins : It collect blood from kidneys.

v) Supraranial veins : they drain impure blood from supraranal glands.

vi) Hepatic veins : They drain blood from liver into venacava.

vii) Inferior phrenic veins : they drain blood from lower surface of diaphragm.

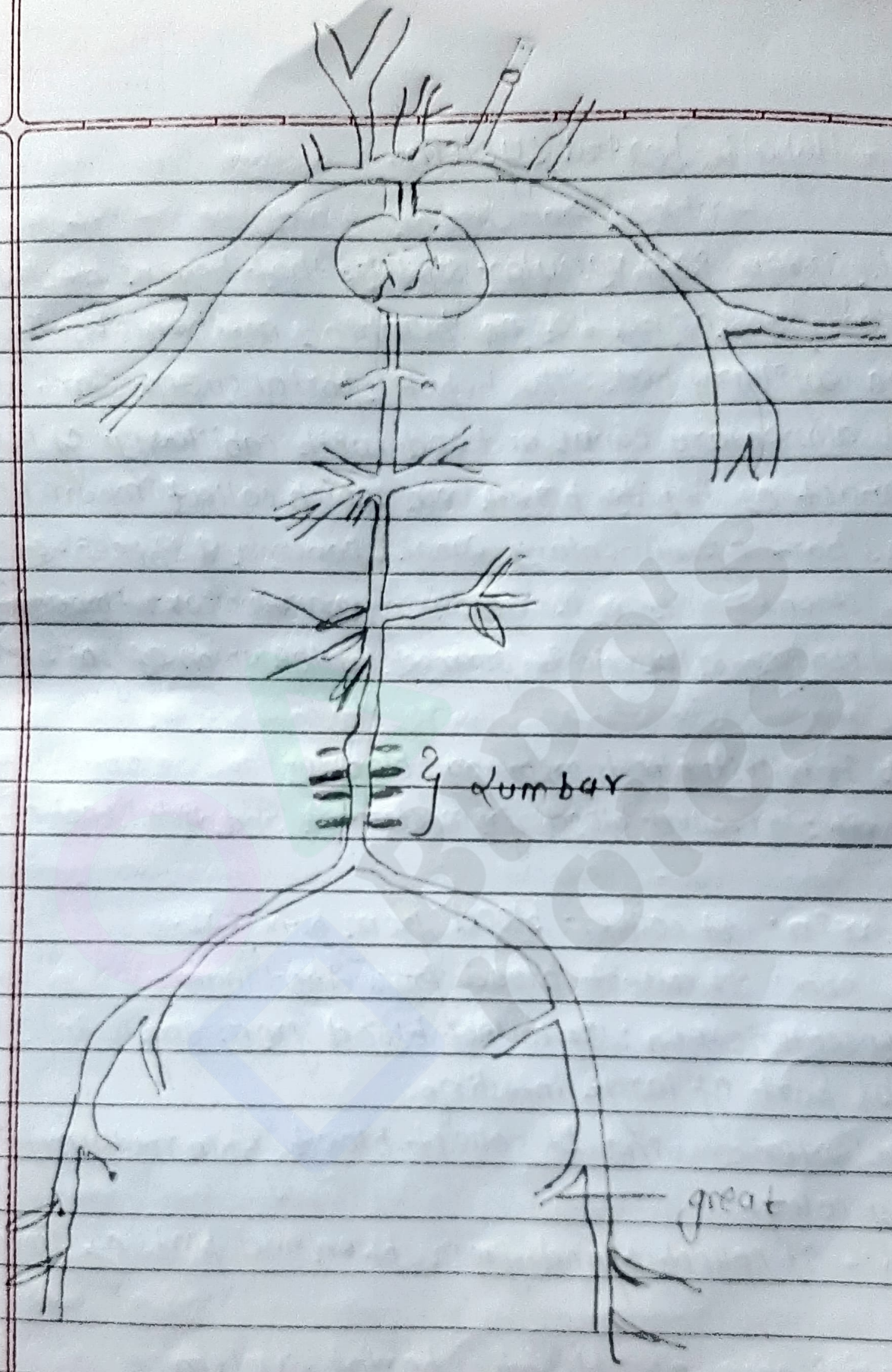

fig:- venous system

Hepatic portal system.

A portal system is a vascular system that begins and end with capillary beds and has no pumping mechanism like heart between two capillary beds. The hepatic portal system start with c- apillaries of alimentary canal and end with capillary of liver. Th is system consist of hepatic portal vein which collect impure blood from various part of alimentary canal, pancreas & spleen. such im pure blood ist enter onto liver than in inferior vena cava through hepatic veins. The hepatic portal vein is formed by the union of following veins.

- cystic vein: It collect blood from gall bladder.
- gastric
- ~~pancreatic~~ vein: It collect blood from stomach and distal end of Oeso phagus.
- pancreatic vein: It collect blood from pancreas.
- Duodenal vein: It collect blood from duodenum.
- Superior mesenteric vein: It collect blood from small intestine and proximal part of large intestine.
- Inferior mesenteric vein: It collect blood from rectum, pelvic & decending colon.
- Splenic vein:- It collect blood from spleen and parts of stomach.

Significance of Hepatic portal system.

i) Liver store excess glucose in the form of glycogen. this process is called glycogenesis where there is deficency of glucose, the glyco
ii) gen is broken into glucose (glycogenolysis) which is released into blood.

ii) kupffer cells remove germs and other debris from blood and keep fat cells.

iii) Liver detoxify certain poisonous substance.

iv) It also help in excretion of unwanted substance like ammonia which is converted to Urea.

Blood grouping in Human

In 1900 Karl land stepner discovered three types of blood groups (A, B and O) in human beings. Later on, 4th blood group (AB) was reported by Decastello and stur in 1902.

Blood contain two types of proteins

- Antigen in RBC.
- Antibody in plasma.

the antigen are designed by english alphabets - A and B. Depending on the presence and absence of antigen and antibodies four blood groups have been classified. They are designated as A, B, AB and O blood groups. It is called ABO blood system.

The following table represent the antigen and antibodies present in person of different blood groups.

Blood Group	Antigen in RBC	Antibody in plasma
A	A	Anti :- B ib.
B	B	Anti - A, a.
AB	A and B	None
O	None	Anti - A+B, a+b

Blood Transfusion:-

For blood transfusion, blood should not be clumped. For this before transfusion blood group should be matched.

Blood group	can donate to	can receive from
A	A and AB	A, O
B	B & AB	B, O
O	A, B, O & AB	O
AB	AB	A, B, O & AB.

Blood group AB has no antibody in plasma so people with AB Blood group can receive any type of blood. So AB is universal acceptor & blood group has no antigen in RBC so blood group O can donate blood to all type of blood, hence called universal donar but it can receive blood any only from blood group O.

Blood group determination:-

In order to determine the blood group of person, a little of his blood is mixed separetly with serum from group A and group B.

If the blood cell clump in serum A. Blood group is B.

If the blood cell clump in serum B blood group is A.

Clumping in both serum A and B indicates blood group AB.

If the blood cell donot clump in both serum A and B indicate the blood group O.

Blood group	serum A	serum B
A	−	+
B	+	−
AB	+	+
O	−	−

(−) No clumping
(+) clumping

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Inheritance of blood group.

Bernstein (1924) discovered that ABO blood grouping is an inherited characteristics which involve multiple allelism. Three allelic gene I^A, I^B and I^O control inheritance of blood group and determine antigen. Both I^A and I^B are dominant and I^O is recessive. I^A has antigen A, I^B has antigen B & I^O has no antigen and AB and both A and B antigen. A person naturally have only 2 allelic gene out of three.

There is six type of genotypic combination so the possibility of blood group after parent mating is shown as;

Blood group of parents	Blood group of offspring possible	Impossible.
O x O	O	A, B, AB.
O x A A x A	O, A	B, AB.
O x B B x B	O, B	A, AB.
A x B	O, A, B, AB	—
O x AB A x AB B x AB AB x AB	A, B, AB	O, AB O

Rh factor

Rh-factor is a kind of antigone (protein) found on surface of RBC which was isolated by K. Landsteiner and weiner in 1940 from blood of Rehesus monkey. If a person contain Rh. antigen is called Rh+ and blood doesnot contain Rh-antigen called Rh- . About 85-1. people has Rh+ blood and only 15%. has Rh- like blood type it is also inherited.

Rh+ and Rh- blood are incompatible and cannot be mixed. Normally Rh-person doesnot contain any antibody. so Rh factor has two great importance.

(i) During blood Transfusion:

If Rh- person receive blood from Rh+ person, there will be no reaction initially but Rh+ factors sensitive the system of Rh- person and evolve antibody formation against Rh+ factor. It is little danger during 1st transfusion but 2nd transfusion is danger or serious even fatal due to patient has already formed antibody against Rh+ blood.

(ii) During pregnancy:-

If Rh+ male mates with Rh- female, female conceive Rh+ foetus in her womb & Rh+ factor passed to the circulatory system of mother through placenta and sensitize Rh antibody formation. At that time 1st body is normally ~~de~~ due to small amount of Rh antibody. Again 2nd conception with Rh+ male & Rh+ foetus is formed but result will be dangerous. Sometime child dies before birth. It is due to already formed Rh antibody in mother which pass to Rh+ foetus from circulation and cause clumping of RBCs. Such disease is calle

Erythroblastosis foetalis.

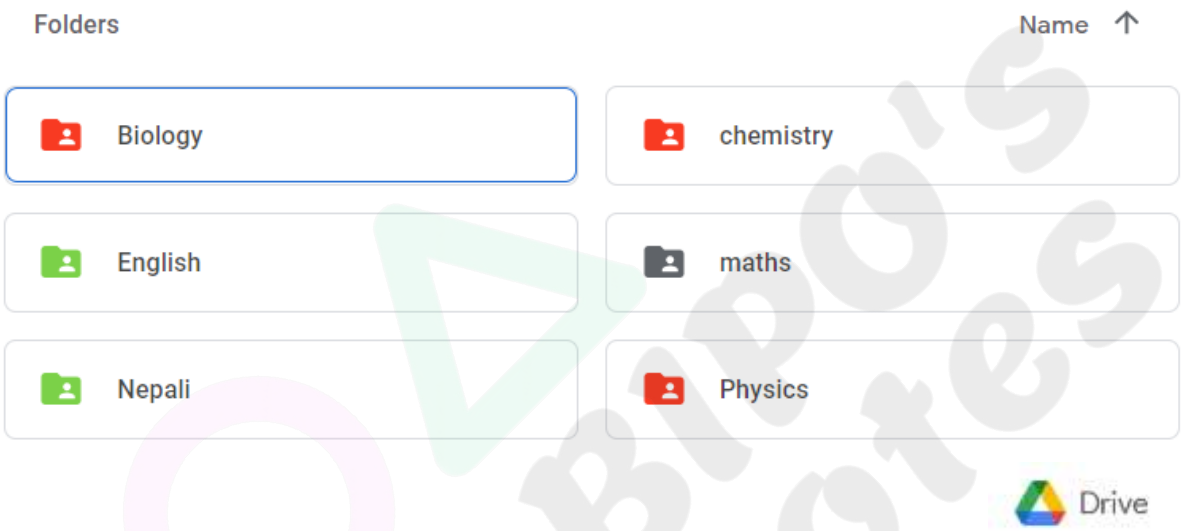
Role of blood grouping

- forensic use.
- Genetic disease.
- blood transfusion.
- Haemolytic disease of new born baby.

Bipin Khatri

(Bipo)

Class 12 complete notes and paper collection.



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