Physiology

Lecture 5

Circulatory system

By

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Circulatory System

It is an organ system that allows blood to circulate and transport nutrients, oxygen, carbon dioxide, hormones, and blood cells to and from cells in the body; This is to provide it with nourishment, help fight disease, stabilize temperature and pH, and maintain homeostasis

Function of circulatory system

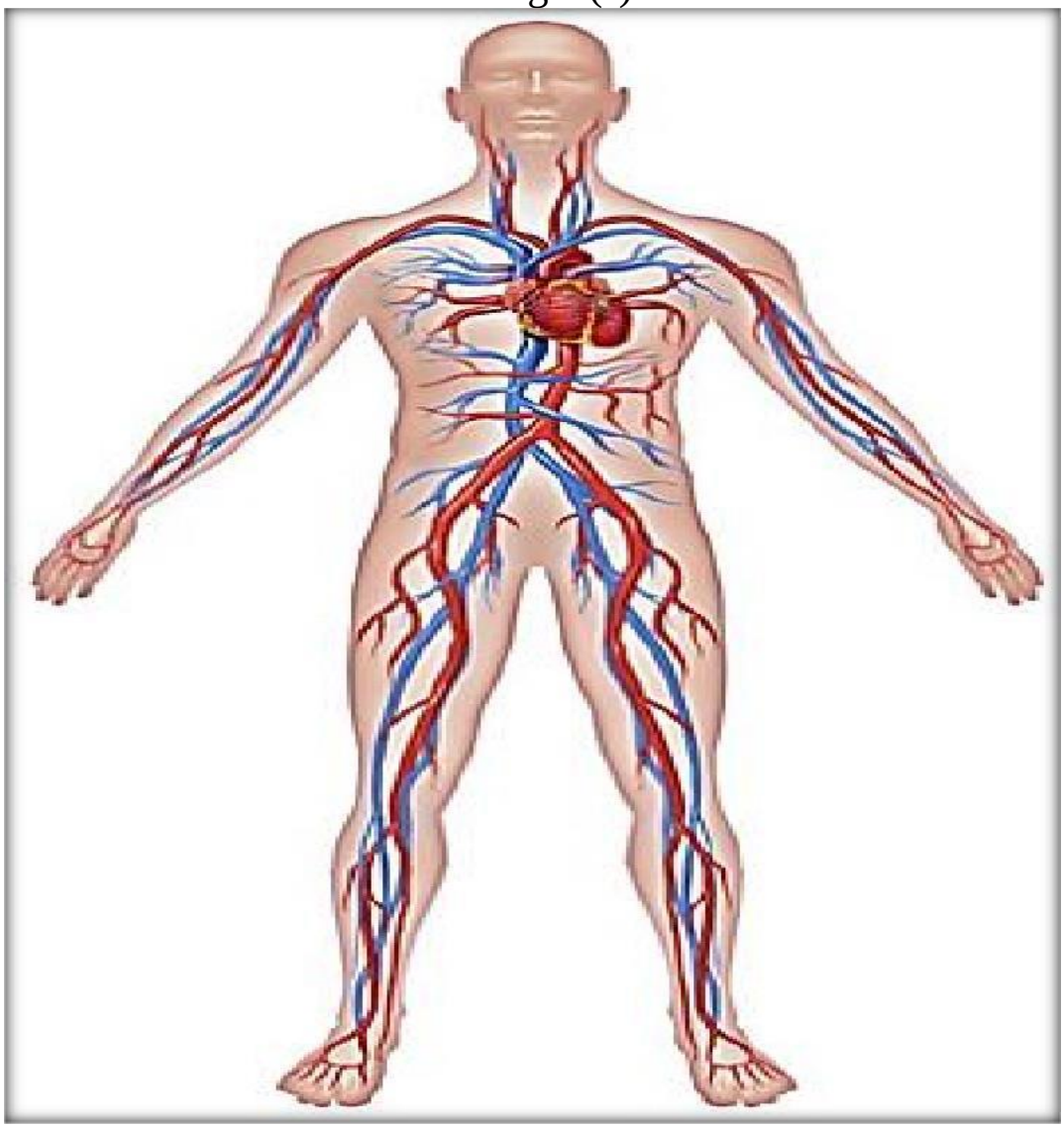
1. To carry nutrients to all body cells

E.g. glucose, amino acids, oxygen

2. To carry wastes away from all body cells

E.g. ammonia, carbon dioxide

3. Circulating fluid called blood flows through flexible pipe-like structures called vessels and organ(s) to move the blood.



Human Circulatory System Consists of :

1- Heart-Pumps the blood

2- Blood vessel- conduits through which blood flows

3- Blood-substance which carries the materials being transported.

1- Heart

- Located near center of your chest
- 4 chambers

Atrium:

- ✓ upper chambers of the heart
- ✓ Receives blood Ventricle:
- ✓ lower chambers of the heart
- ✓ Pumps blood

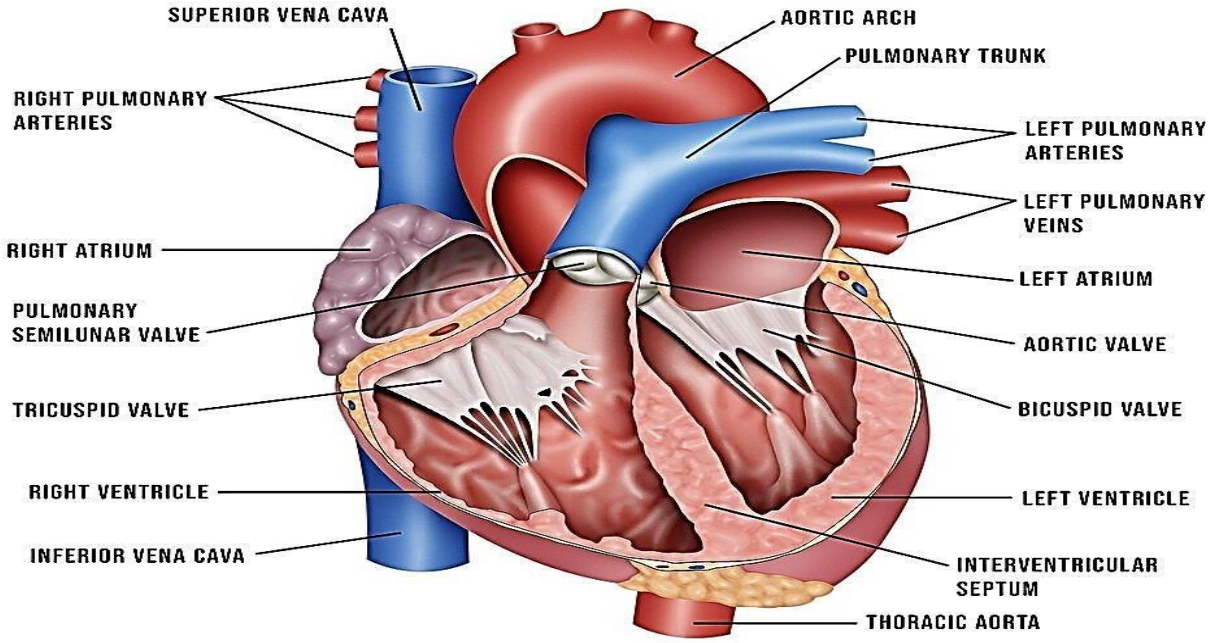
Heart functions

- **Right side**

pumps blood from the heart to the lungs (pulmonary circulation) In lungs CO2 leaves blood and O2 is absorbed.

- **Left side**

pumps blood from the heart to the rest of the body.



2- Blood Vessels

Three types of blood vessels

✓ **Arteries**

 Carry blood away from the heart

 except for the pulmonary arteries all arteries carry oxygen rich blood

 thick walls that help withstand pressure produced when heart contracts and pushes blood

 artery walls contain connective tissue, smooth muscle and endothelium

✓ **Veins**

 Carry blood toward heart

 Carry oxygen-poor blood

 Walls contain connective tissue and smooth muscle

 Valves in vein to keep blood moving toward heart

– Many veins located near skeletal muscles (contractions help push blood thru veins)

✓ **Capillaries**

 Connect arteries and veins.

 Smallest of blood vessels.

 Walls only one cell thick.

 Very narrow blood cells must pass thru single file.

 Where gases are passed to/from tissue.

Blood Pressure

Blood pressure regulated 2 ways:

1. Neurotransmitters cause smooth muscles in blood vessels to contract or relax

2. Kidneys remove water from blood when blood pressure is too high (this reduces blood volume and lowers blood pressure)

Diseases of the Circulatory System

Hypertension

- ✓ Forces the heart to work harder, may weaken or damage the heart muscle and blood vessels
- ✓ More likely to develop coronary heart disease
- ✓ Increases the risk of heart attack or stroke

Atherosclerosis

- ✓ Fatty deposits called plaque build up on inner walls of arteries
- ✓ Blocked artery can die from lack of oxygen
- ✓ If enough heart muscle is damaged = heart attack

Blood

is a body fluid in humans and other animals that delivers necessary substances such as nutrients and oxygen to the cells and transports metabolic waste products away from those same cells

<u>COMPOSITION OF BLOOD</u>

- ☒ Plasma

Albumin (the chief protein constituent)
Fibrinogen (responsible, in part, for the clotting of blood)
Globulins (including antibodies).

- ☒ Cellular elements
- ❖ RBCs (erythrocytes):

Transport O2 from lungs to tissues.
Transport CO2from tissues to lungs.

- ❖ WBCs (leucocytes):

Defense against diseases, fungi, parasites and microorganisms

- ❖ Platelets (thrombocytes): Blood clotting