

Cadiovascular System-1

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Clinical Problem

A 54 years old man seen in the cardiology clinic complaining of severe weakness, fatigue, dry cough, weight gain and difficulty in breathing. He feels severe shortness of breath while walking up stairs of his second floor apartment. He still complains of lesser severity of symptoms at rest. He states he often awakens at night feeling like he was suffocating. He is now sleeping with three pillows under his head. Lately he has taken to fall asleep while he is sitting watching T.V. He also complains of having to urinate 3-4 times per night. He was hospitalized with heart problem two months ago and was told that the efficiency of his heart is less than 30% and he needs ?? and has to wait until??. On examination his weight is 95Kg, height is 165 cm, blood pressure was 140/85 mmHg, his heart rate 90 beats/min and regular, his resp. rate is 28/min and labored.

Auscultation of the heart reveals abnormal heart sounds

Objectives:

- Introduction to the CVS physiology
- Review the anatomy of the CVS.
- List the functions of the CVS
- Comprehend the pump nature of the heart

University of Jordan
Cardiovascular Physiology for *Medical Students*
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Textbook: Textbook of Medical Physiology
By: Arthur C. Guyton & John E. Hall 12th Edition 2011

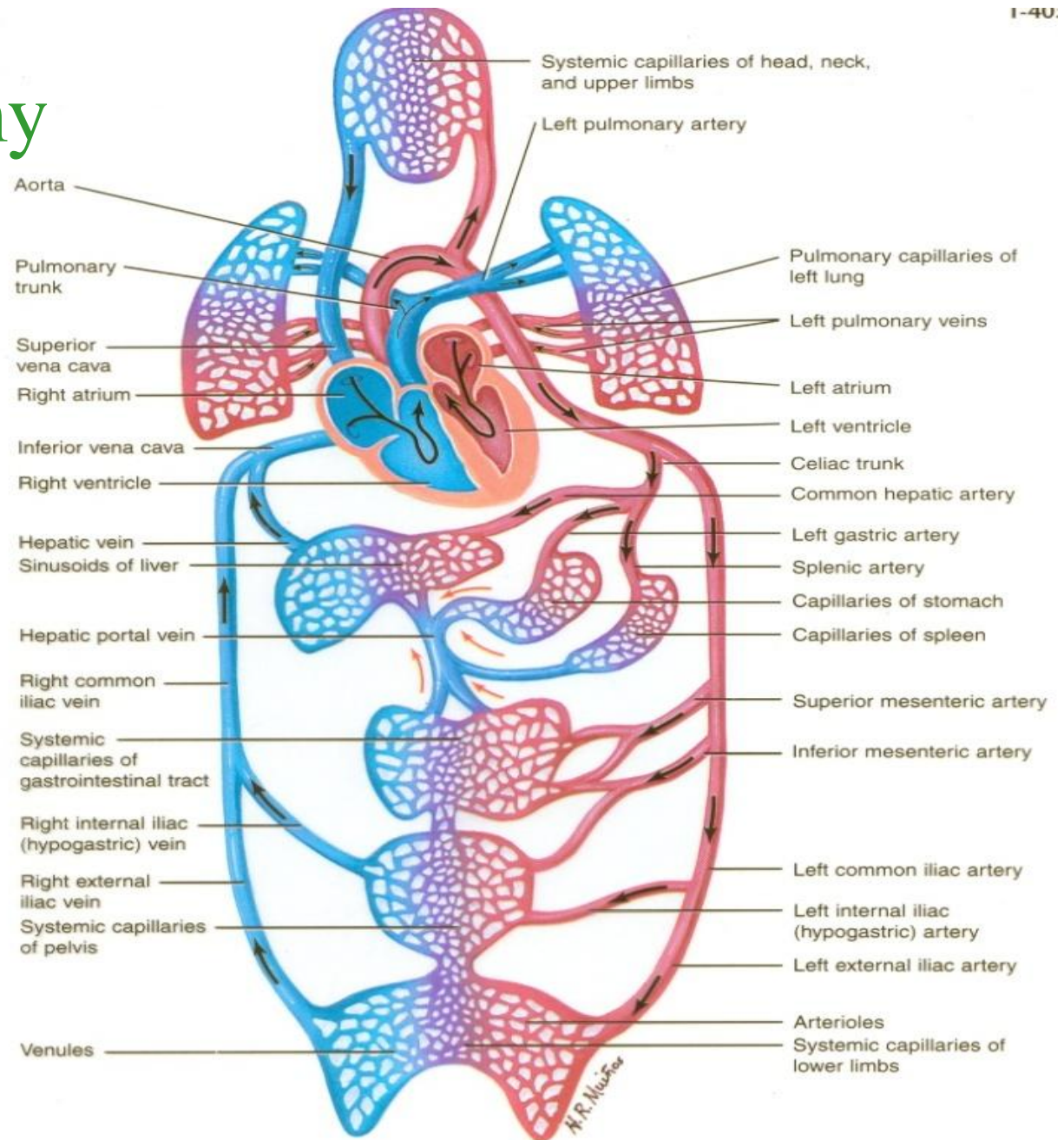
<u>Lecture Topics</u>	<u>Guyton 11th</u>	<u>Guyton 12th</u>
1. Introduction	57-71,103-106	57-69, 101-104
2. Cardiac mm. Physiology		
3. Cardiac mm. Physiology	103-106	101-104
4. Conduction System of the heart	116-121	115-120
5. Electrocardiography	123-130	121-127
6. Electrocardiography	131-138	129-136
7. Electrocardiography	147-157	143-153
8. Electrocardiography		
9. Heart as a pump and cardiac cycle	106-115	104-113
10. Heart as a pump and cardiac cycle		
11. Heart as a pump and cardiac cycle		
12. Cardiac output and venous return	232-245	229-241
13. Cardiac output and venous return		
14. Circulation / systemic	161-163	157-158, 168-175
15. Circulation / Haemodynamics	164-180	159-166, 167-168
16. Arterial System/Regulation of arterial blood pressure	204-215	201-211
17. Arterial System/ Regulation of ABP.	216-231	213-228
18. Blood flow / Tissues and its control	195-203	
19. Microcirculation (capillary exchange)	181-194	177-189
20. Special circulations (coronary Muscle blood flow and exercise	246-253	243-253

Optional Readings:

1. Physiology , latest edition , by : Berne and Levy last edition
2. Physiological Basis of Medical Practice, twelfth edition , by : John B. West 1990.
3. Human physiology from cells to systems, latest edition, by: Lauralee Sherwood. Last edition

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Cardiovascular System Anatomy



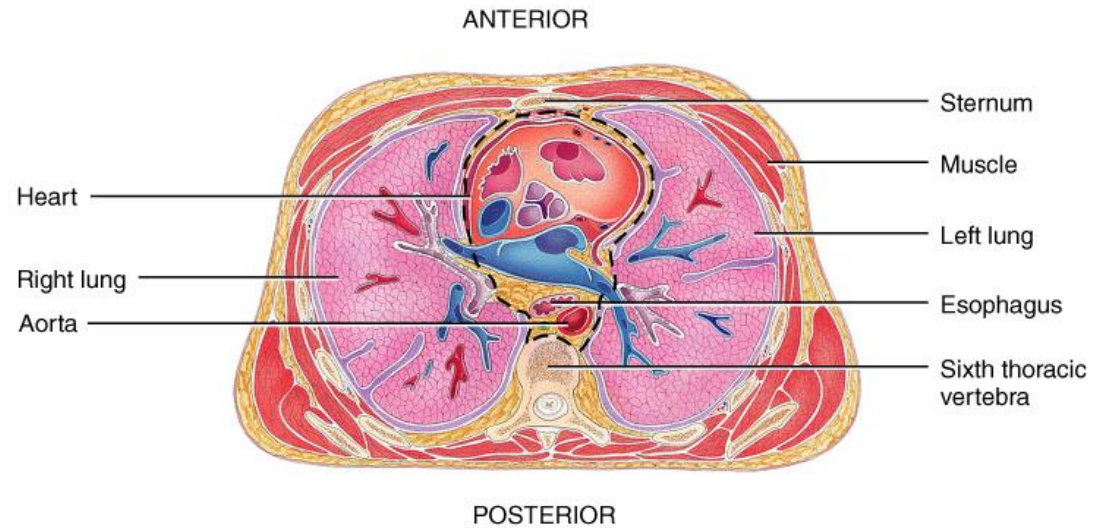
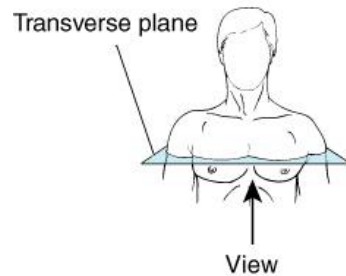
General plan of circulation

History of cardiac Transplant

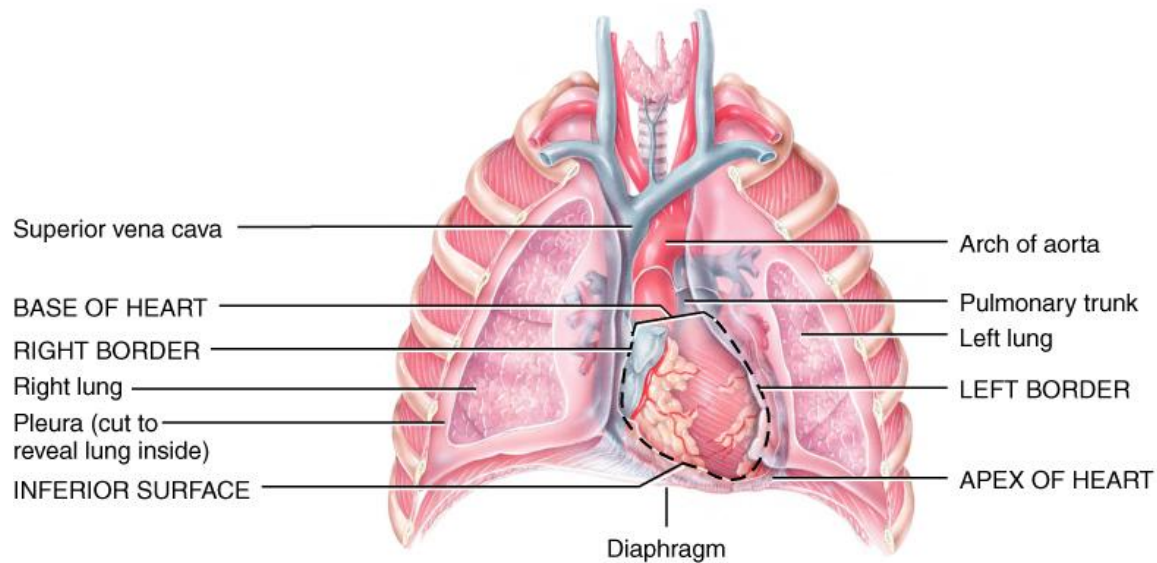
- **In 1967**, Christiaan Barnard in Cape Town, South Africa transplanted the first Human Heart removed from a 25-year-old woman who had died following an auto accident and placed it in the chest of Louis Washkansky, a 55-year-old man dying of heart damage. The patient survived for 18 days. The problem was Rejection- Cyclosporine – immunosuppressant -decreased that.
- **In 1984, the world's first successful pediatric heart transplant** was performed at Columbia on a four-year-old boy. He received a second transplant in 1989 and continues to live a productive life today.

History of cardiac Transplant...cont

- **In 1984**, in Linda Loma, California, Leonard Bailey, implanted a baboon heart into a 12-day-old girl, she survived for twenty days.
- **In 1982** in University of Utah, the first Total Artificial Heart was implanted in the chest a dentist Barney Clark by William DeVries. Clark survived for 112 days-The problem was blood clotting.

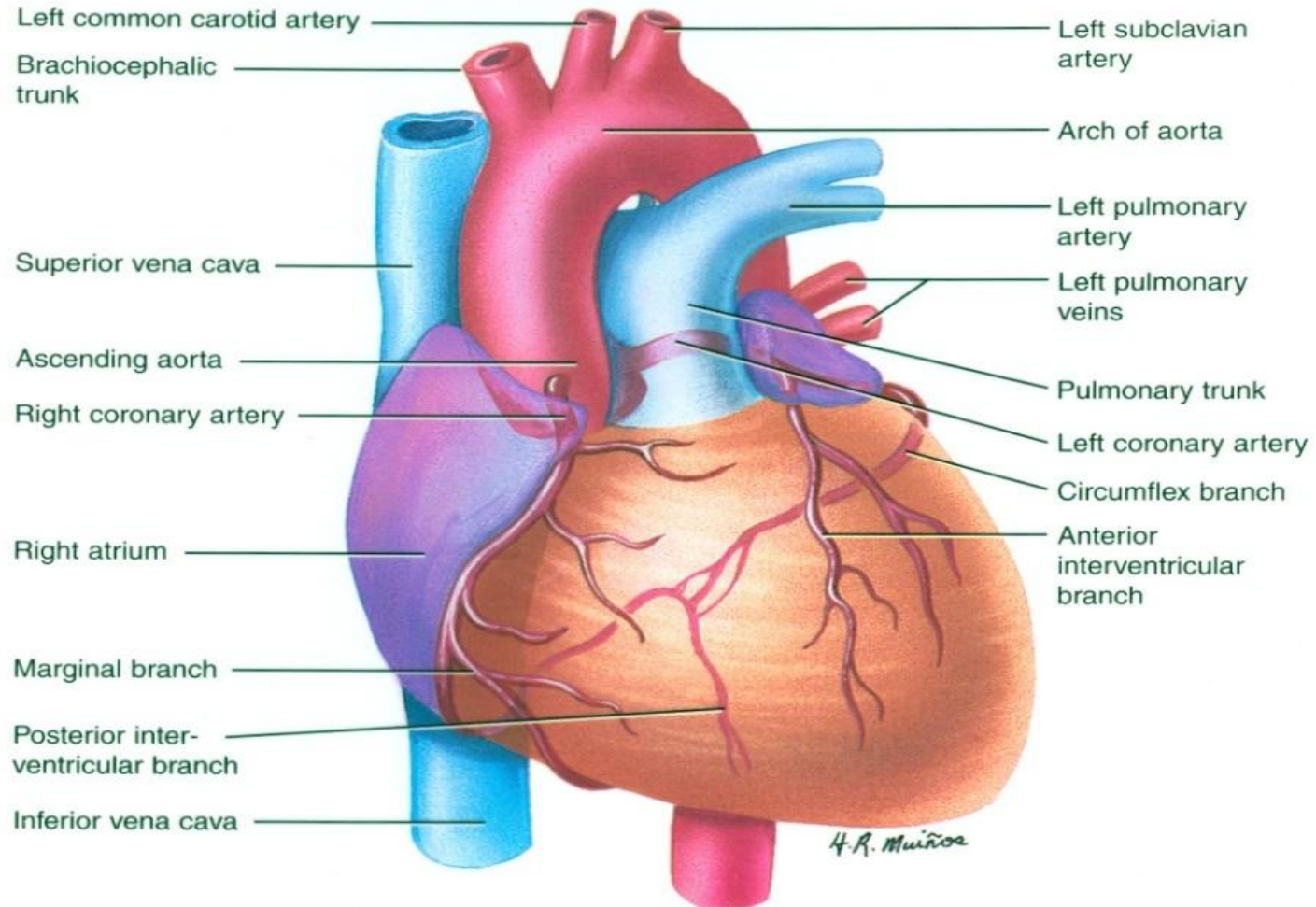


(a) Inferior view of transverse section of thoracic cavity showing the heart in the mediastinum

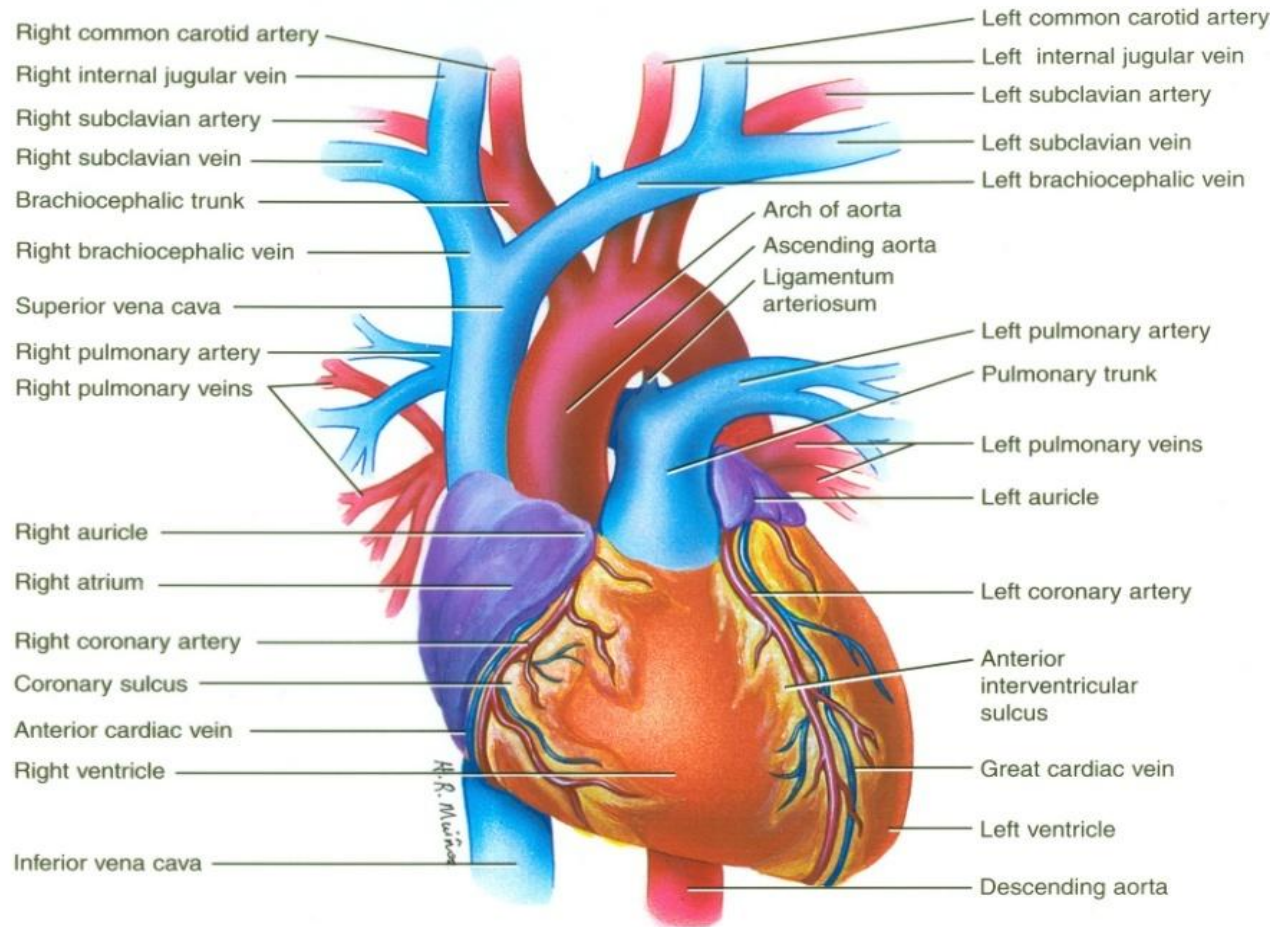


(b) Anterior view of the heart in the mediastinum

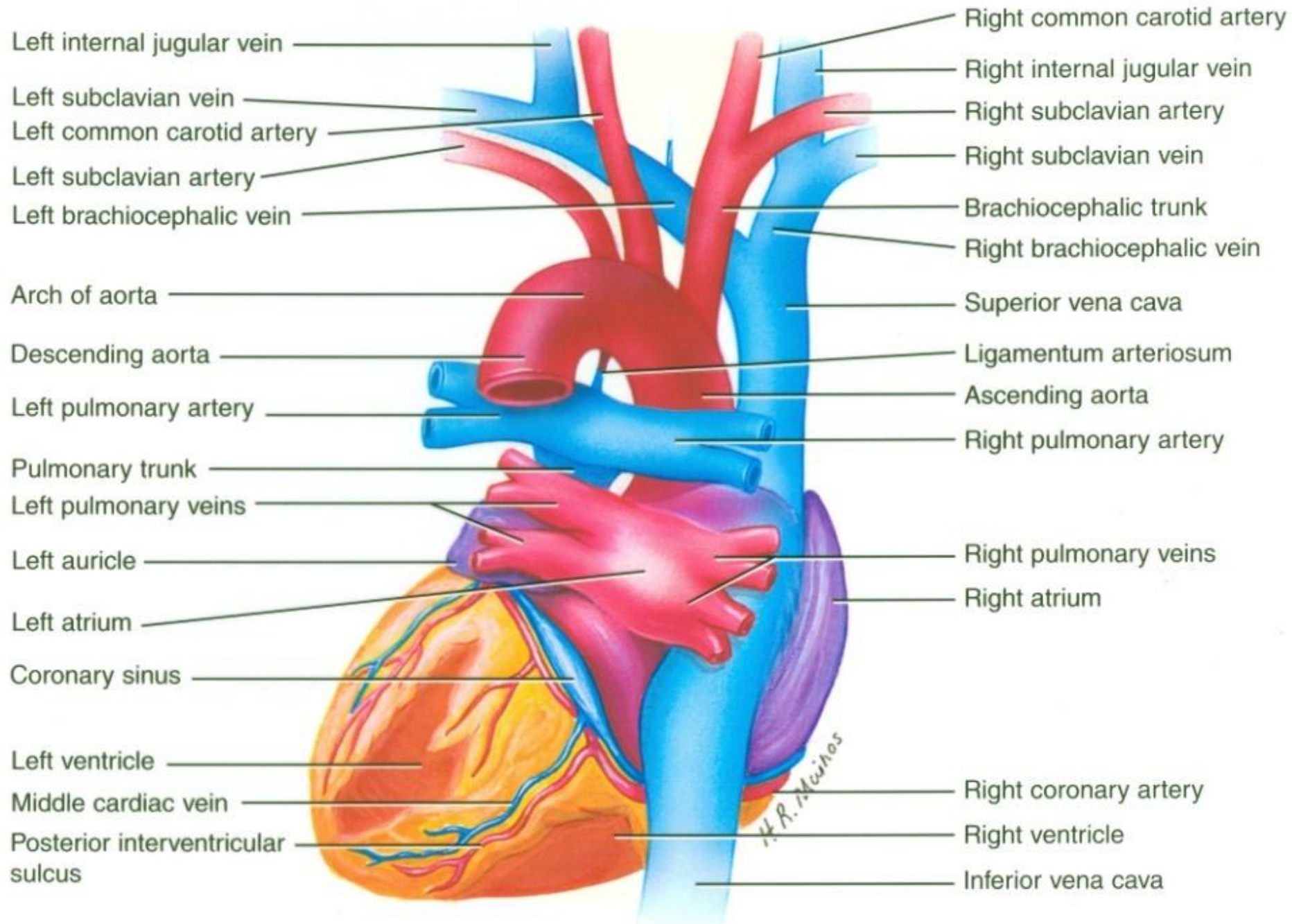
Anatomy of the heart



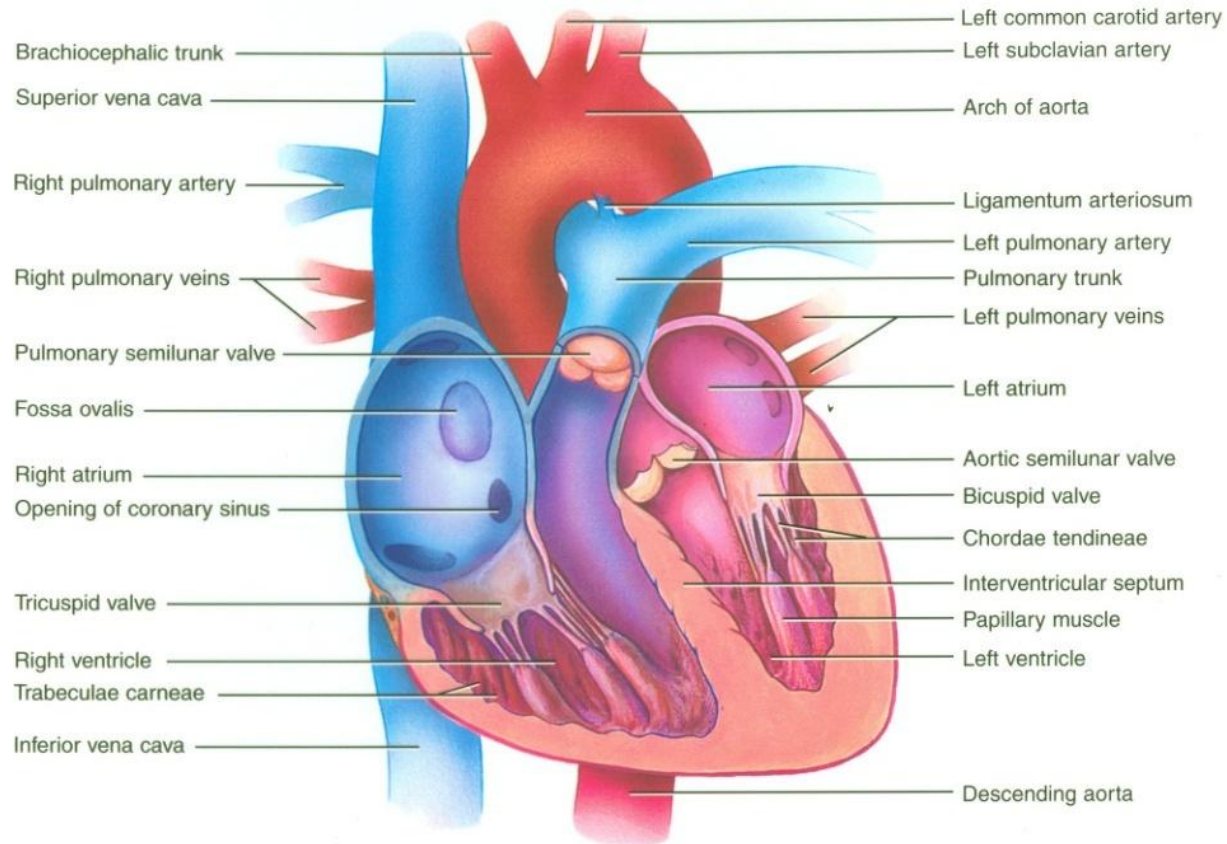
Anatomy of the heart



Anterior External View of Structure of Heart, Fig# 20.4a

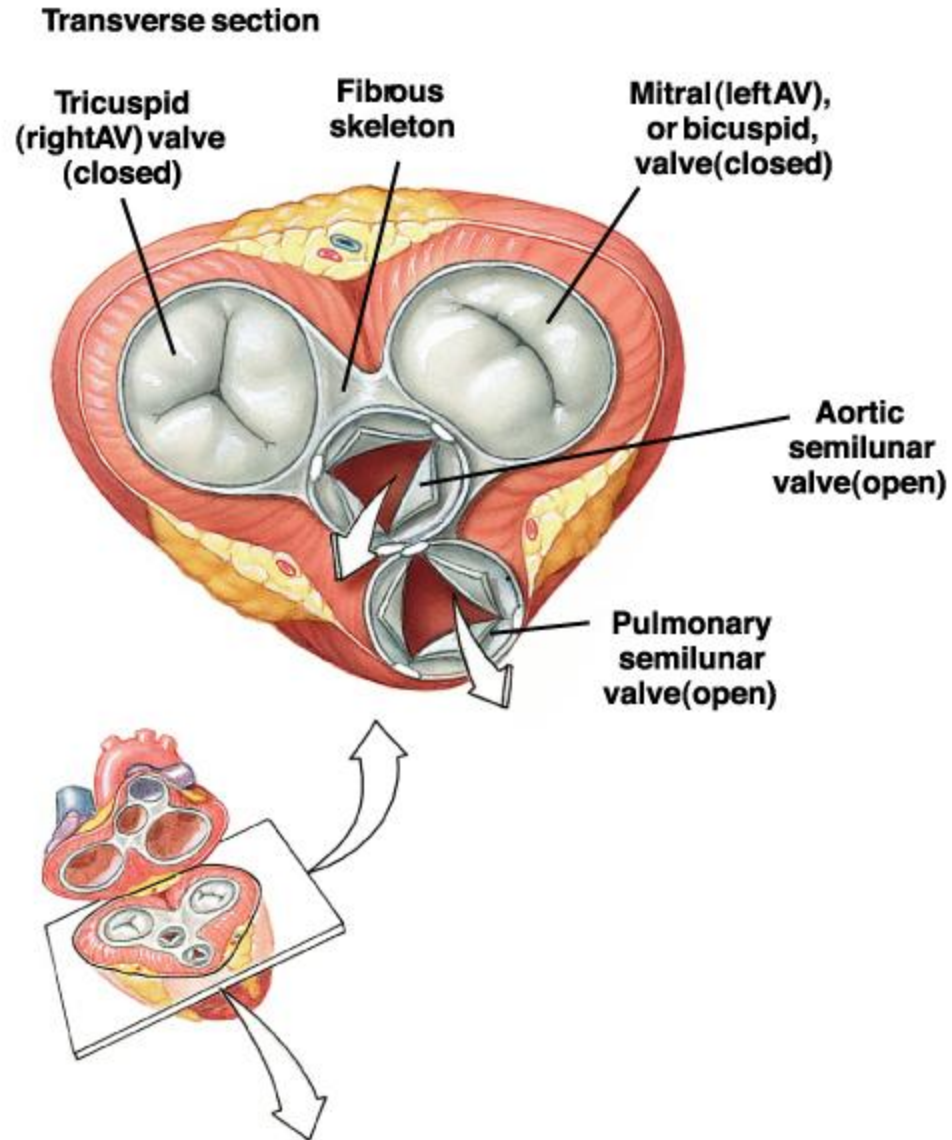


Cardiac valves

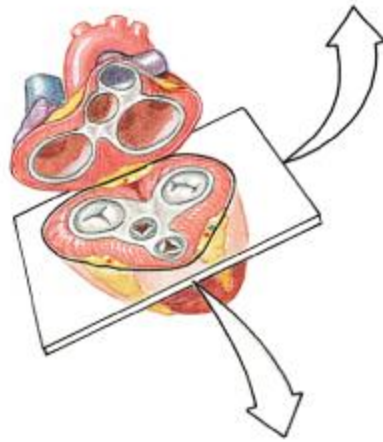


Anterior View of Frontal Section of Structure of Heart, Fig# 20.4d

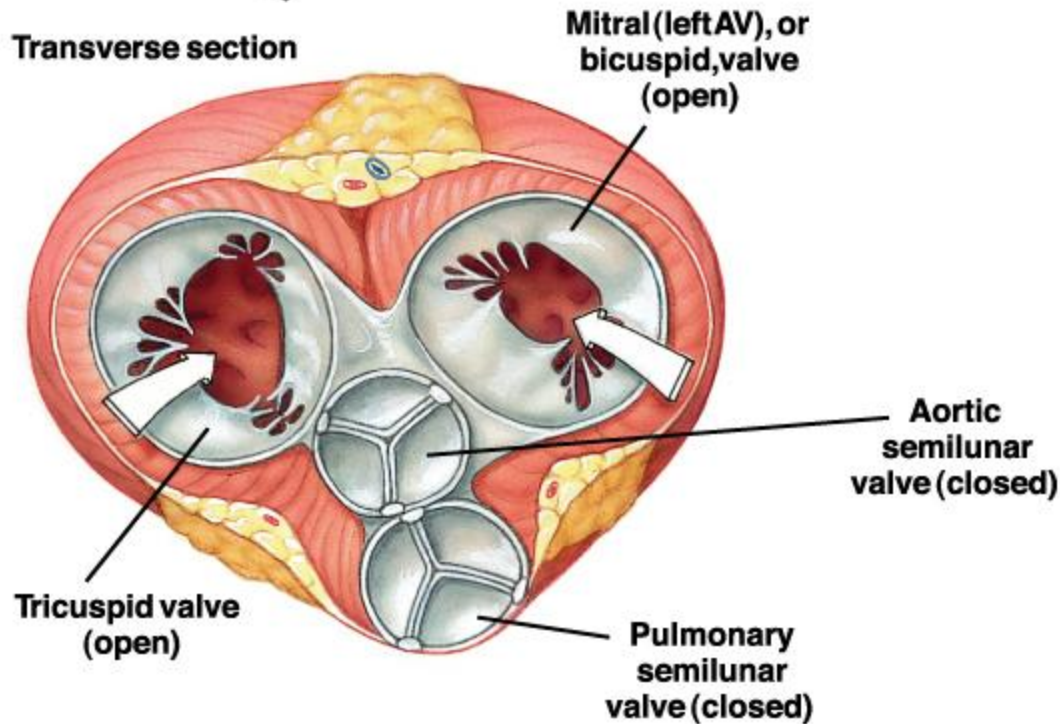
Cardiac valves



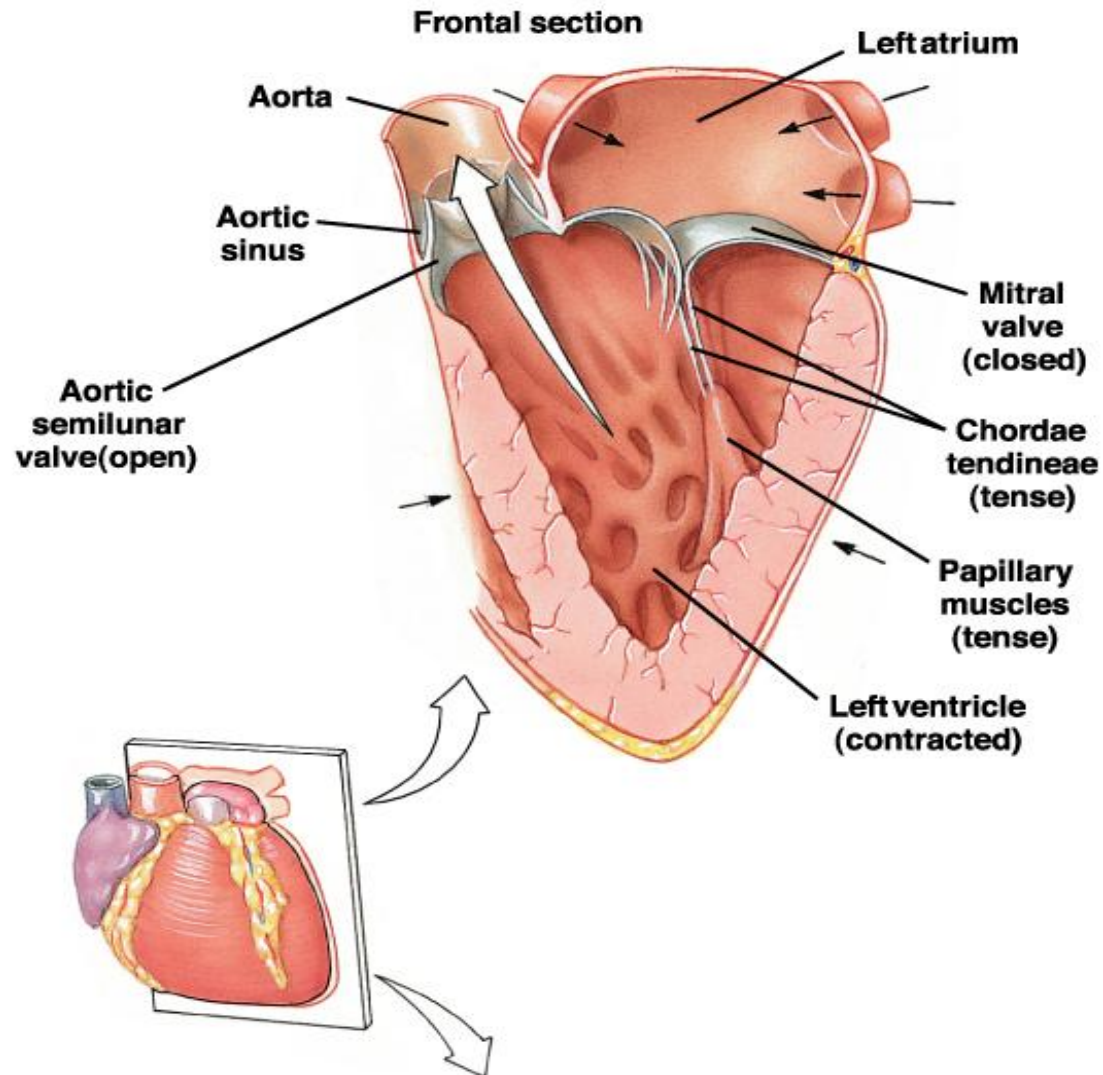
Cardiac Valves Open and Close Passively



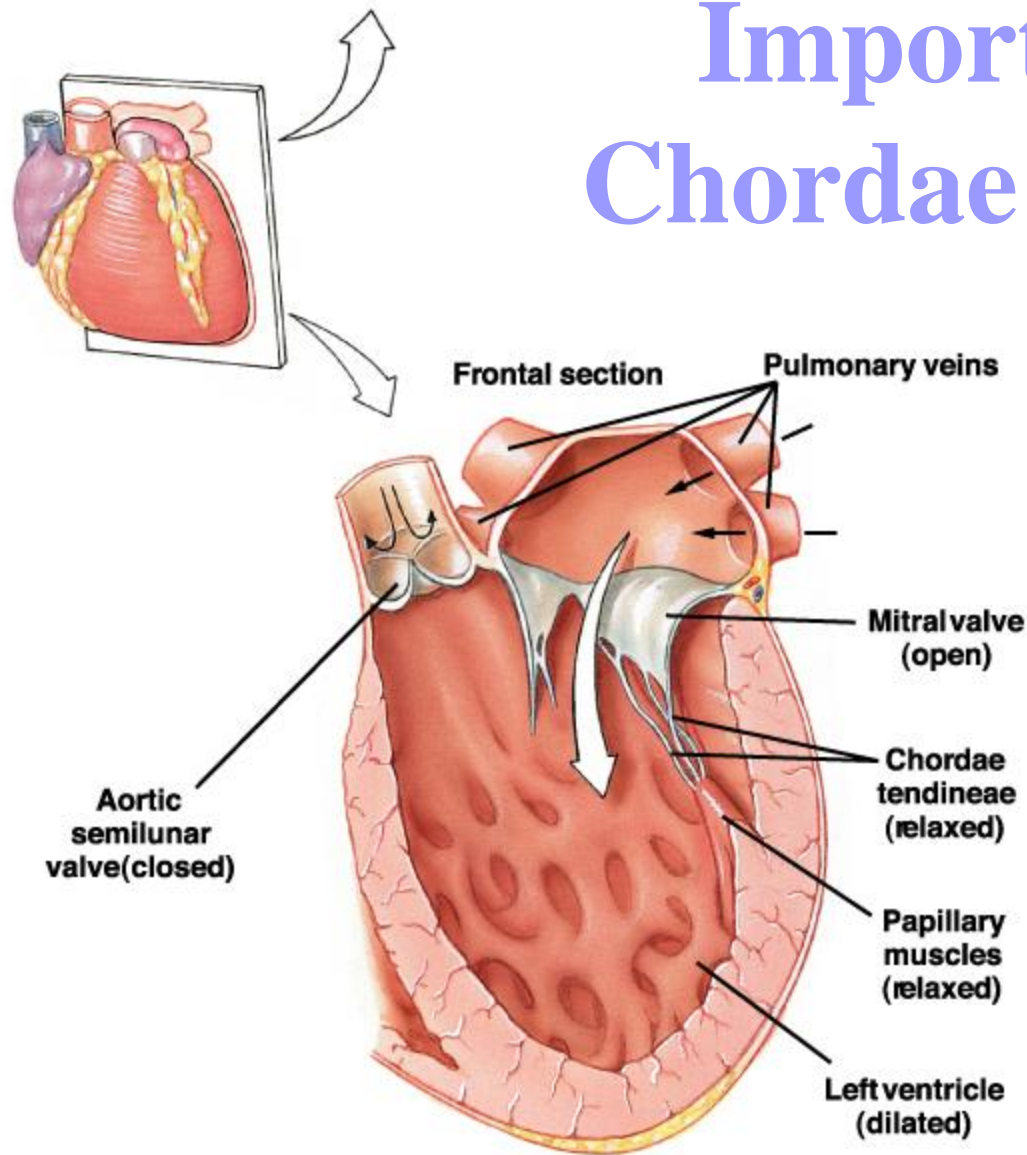
Transverse section



Importance of Chordae Tendineae

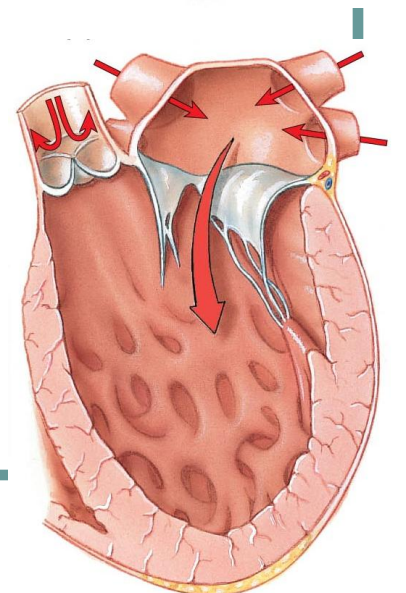
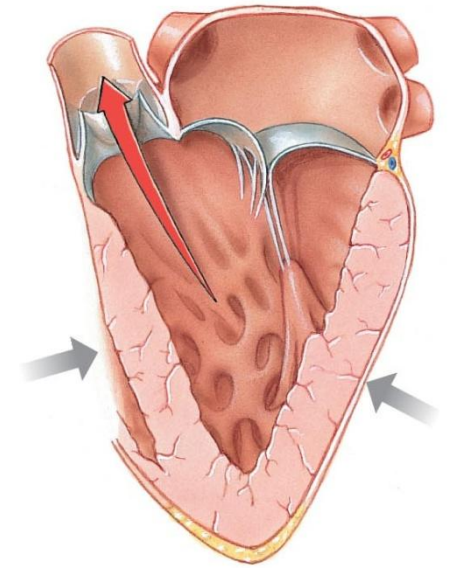


Importance of Chordae Tendineae

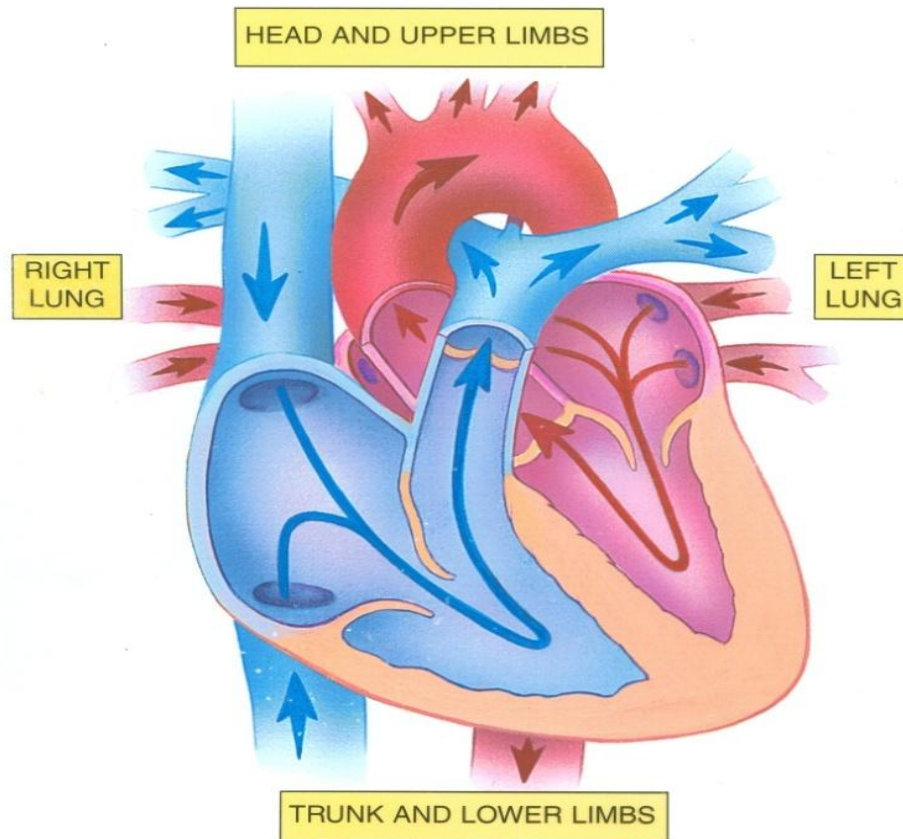


Functional Anatomy of the Heart Valves

- Function is to prevent backflow
 - Atrioventricular Valves
 - Prevent backflow to the atria
 - Prolapse is prevented by the chorda tendinae
 - Tensioned by the papillary muscles
 - Semilunar Valves
 - Prevent backflow into ventricles



Movement of blood in the heart



Blood Flow: Path of Blood Through Heart, Fig# 20.6a

Thank You

