

HEART

revised 01March2016

S~ p. ~89-, Martini's 4th: 673-705, Martini's 5th: 654-689 Martini's 6th: 683-716, 7th: 670-703, 8th: 681-694, 9th: 670-703, 10th: 684-720

Circulatory system is "closed," lined with endothelium

"leakage" constitutes lymph, returned via lymphatic system (see previous lecture.)

Draw: 2 circuits, pulmonary & systemic: thus the two pumps of heart. (p 685)

EMBRYOLOGY: future heart first pulsating tubule, pumps **back to front**

5th week, shaped like S, divides:

anterior: aorta and pulmonary trunk

posterior: superior and inferior VC

By seventh **week**, partitions develop: four chambers result

ANATOMY: occupies space between lungs, **mediastinum**. (P 687)

Base (vessel end) behind sternum, level with 2nd intercostal space

Apex (point) down to L, reaches 5th intercostal space with R ventricle resting upon diaphragm

COVERINGS: pericardium: double walled sac, lined with serous membrane, folds back on self at large vessels

p 689 **Parietal** pericardium, two layers: **fibrous** outer and **serous** inner

Pericarditis, serous layers roughened, pain when rub against each other

LAYERS OF THE WALLS: p 689

Epicardium **visceral** pericardium

Myocardium thickest, muscular layer, folds and bridges: **trabeculae carneae** (little beams of flesh)

Endocardium connective tissue covered with squamous cells continuous with lining of blood vessels foldings of endocardium form valves (atrioventricular and semilunar valves)

TO DRAW: 1) valves in a diagonal row: pulm, aortic semi, tricuspid

2) place mitral to immediate L of tricuspid.

in order: 3) draw pulmonary trunk first (front, up to R), then aorta behind

p 676 4) lining of the ventricles, septum

5) lining of atria (include vena cavae)

5) papillary muscles, chordae tendonae to AV valves

6) outer muscular walls, L ventricle *thicker*

7) vena cavae, coronary sinus opening

8) pulmonary veins into L atrium

Chambers: Atria entrance way, (also auricle) thin walls, load blood into ventricles.

ventricles little belly, major pumper, R has thin wall, L thick (draw cross section) p 693

coronary sulcus where atria and ventricles join (coronary artery lies here)

Vessels: Right side: superior and inferior vena cava, pulmonary trunk, divides to R & L pulm. arteries

Left side: four **pulmonary veins, aorta** (lifting, heaving)

L walls thicker, force needed is greater to circulate around body but volume pumped by two halves must be same.

If not, **congestive heart failure:** weak L side: **pulmonary edema** lungs fill with fluid

weak R side: **systemic edema** ankles swell, liver, high diastolic pressure

SKELETON OF HEART: p 694: **fibrous trigones:** fibrous rings support valves, separates atria from ventricles, insulates.

VALVES:

tricuspid

pulmonary semilunar

bicuspid (mitral)

aortic semilunar

Papillary muscles

Skeleton of the heart (fibrous trigone):

between R atrium and R ventricle

between R ventricle and pulmonary trunk

between L atrium and L ventricle

between L ventricle and ascending aorta

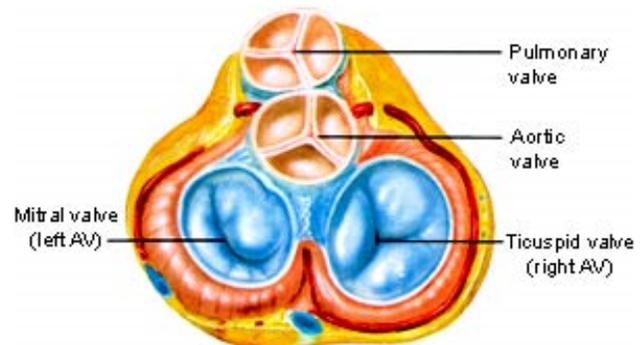
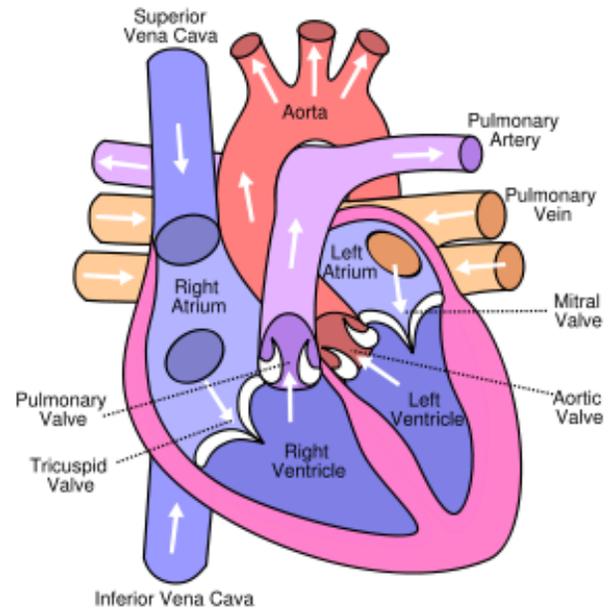
connect via **chordae tendineae** to AV valve cusps, position valves

CARDIAC CIRCULATION (P 696)

Coronary vessels **R and L coronary arteries** exit just above aortic semilunar, circle in AV groove, form **circumflex**

Coronary Veins **coronary sinus** drains into R atrium

Anterior interventricular artery: "heart attack artery"



FUNCTION: Automatic contraction, inherent rhythm, all or none contraction long refractory period. (no tensing of heart muscle)