

## The Cardiovascular System: The Heart

### 1. Introduction

#### A. Location

- i. Thorax
- ii. Mediastinum

#### B. Anatomical Landmarks

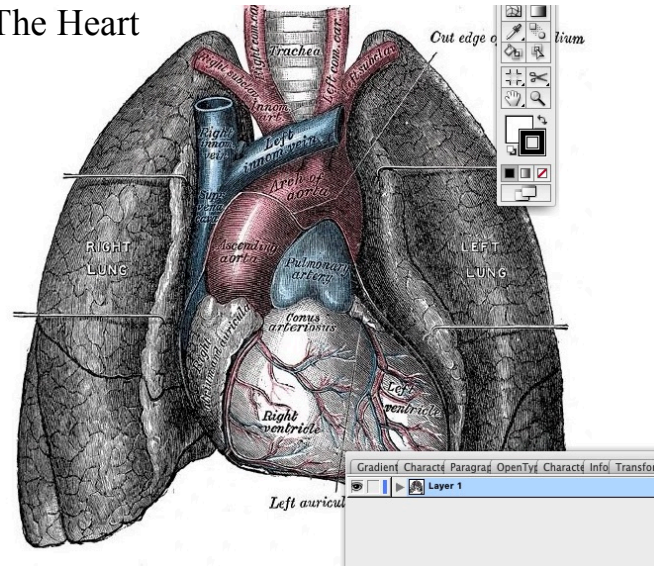
- i. Apex and Base
- ii. Anterior Interventricular Sulcus
- iii. Posterior Interventricular Sulcus
  - a. Interventricular Septum
- iv. Coronary Sulcus

#### C. Pericardium - *(See "Body Cavities" handout {you may have had it in A&P I})*

- i. Fibrous pericardium
- ii. Serous Pericardium
  - a. Pericardial Cavity
    - Parietal Layer
    - Visceral Layer (Epicardium)
    - Pericardial Fluid

#### D. Wall of the Heart

- i. Epicardium
- ii. Myocardium
- iii. Endocardium
  - Endothelium



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E. Cardiac Skeleton (See image on Web Support)

2. Functional Anatomy

A. Double Pump

- i. Right Heart
- ii. Left Heart
- iii. Septum

B. Atria

- i. Auricle
- ii. Atrioventricular Orifices
- iii. Fossa Ovalis
- iv. Pectinate Muscles

C. Ventricles

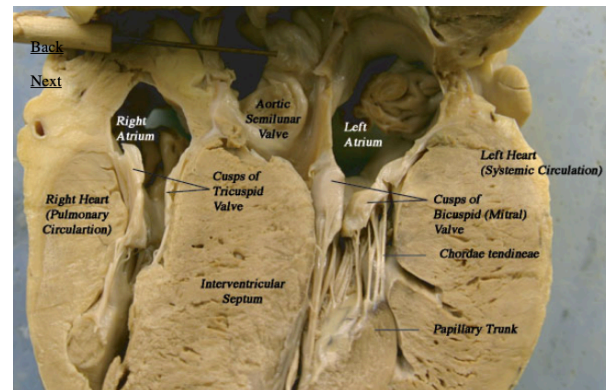
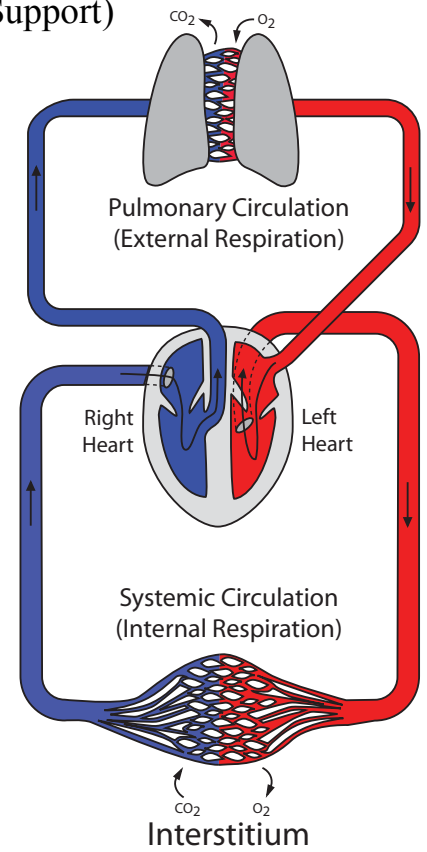
- i. Trabeculae Carneae
- ii. Chordae Tendineae

D. Blood Volume

- Equal Volume
- Thick Left Ventricle

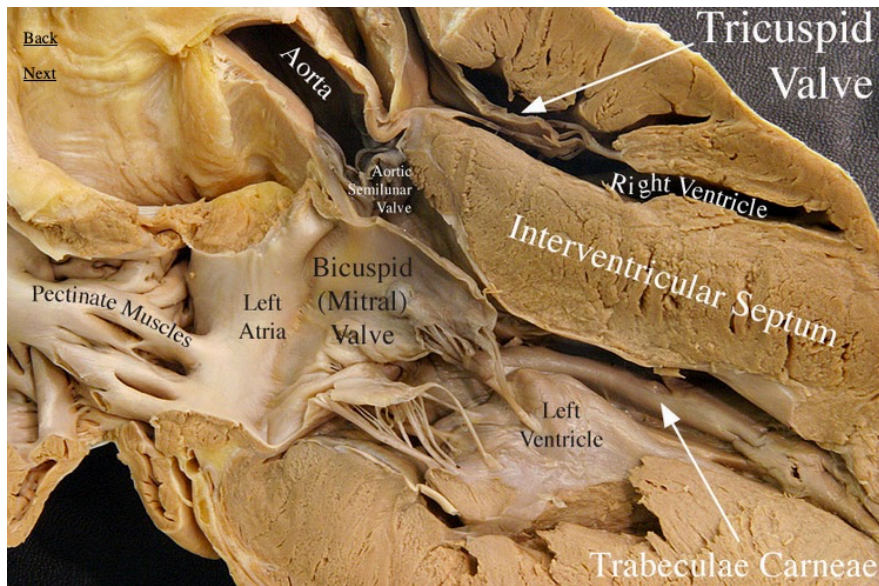
E. General Heart Valve Anatomy

- i. Atrioventricular valves
  - a. Tricuspid Valve
  - b. Bicuspid Valve
  - c. Cusps
  - d. Chordae Tendineae
  - e. Papillary Muscles
  - f. Valve Mechanics and Pressure
    - First Heart Sound “Lub”



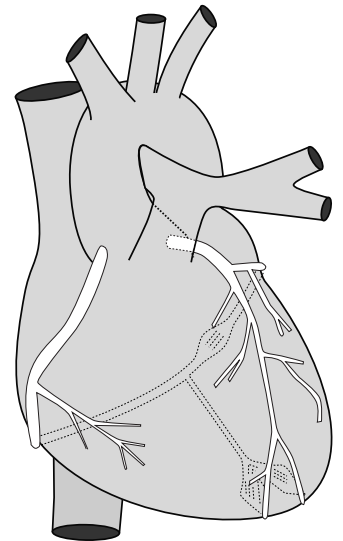
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- ii. Semilunar valves
  - a. Aortic Semilunar Valve
  - b. Pulmonary Semilunar Valve
  - c. Valve Mechanics and Pressure
    - Second Heart Sound “Dub”



3. Great Vessels of the Heart

- A. Pulmonary Arteries
- B. Pulmonary Veins
- C. Superior Vena Cava
- D. Inferior Vena Cava
- E. Aorta
  - i. Ascending aorta
  - ii. Aortic Arch
  - iii. Descending Aorta



4. Blood Supply to the Heart

- A. Coronary Arteries (Know the following seven (7), use diagram on web)
  - i. Right Coronary Artery
  - ii. Left & Right Marginal Arteries
  - iii. Left Coronary Artery
  - iv. Left Coronary Artery
  - v. Circumflex Artery

- iii. Posterior Interventricular Art.      vi      Ant. Interventricular Artery

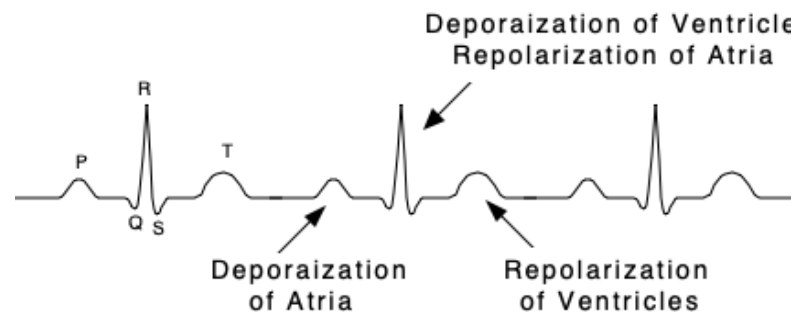
5. Histological Considerations

- A. Intercalated Disks
- B. Gap Junctions
- C. Desmosomes
- D. Syncytium
- E. Myoglobin

6. Conduction System of the Heart

- A. Sinoatrial Node (SA Node)
- B. Internodal Tracts
- C. Atrioventricular Node (AV Node)
- D. Atrioventricular Bundle
- F. Perkinji Fibers
- G. Electrocardiogram

- i. P Wave
- ii. QRS Complex
- iii. T wave



7. **Cardiac Cycle** (ESSAY: Use Text as reference as well as lecture. The points listed below should be used more as a “Check List (✓)” for essay preparation. It is not be a strict guide to the lecture sequence at this point!)

- Systole
- Diastole

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- A. Systolic and Diastolic Events
    - i. Atrial Systole
    - ii. Ventricular Systole
    - iii. Atrial Diastole
    - iv. Ventricular Diastole
  - B. Path of Blood through the Heart (*Several animations are available*)
    - i. Blood enters the Atria
      - a. Superior Vena Cava
      - b. Inferior Vena Cava
      - c. Pulmonary Veins
    - ii. Blood is pumped into the Ventricles
    - iii. Ventricular Hesitation
    - iv. Ventricular Contraction
      - a. Systemic Circulation
      - b. Pulmonary Circulation.
8. Events of the Cardiac Cycle
- A. Contraction
    - i. Ventricular Diastole (Atrial Systole)
    - ii. Isovolumetric Ventricular Contraction
    - iii. Ventricular Ejection
    - iv. Isovolumetric Ventricular Relaxation
  - B. Heart Sounds
    - i. First Heart Sound
    - ii. Second Heart Sound
  - C. Electrocardiogram

9. Beta Oxidation (*pull out handout on “Energy and Cardiac Muscle Contraction”*)
  
10. Autonomic NS Control of the Heart (*pull out downloadable handout on “Cardiac Control”*)
  - Baroreceptors
  - Chemoreceptors
  
  - A. Cardioregulatory Center
    - i. Cardioacceleratory Center (CAC)
      - Sympathetic Fibers
      - Norepinephrine
    - ii. Cardioinhibitory Center (CIC)
      - Parasympathetic Fibers
      - Acetylcholine
  
  - B. Endocrine Control of the Heart (see “Cardiac Control” handout)
    - i. Adrenal Medulla
      - Epinephrine
      - Norepinephrine