CARDIOVASCULAR SYSTEM:
THE HEART
In Anatomy Today
The Heart

- 4 chambers
  - Atria (atrium, singular)
  - Ventricles

- Valves
  - Atrioventricular
  - Semilunar

- Creates pressure to pump blood through 2 circuits
  - Pulmonary
  - Systemic
Circuits of Blood Flow

PULMONARY CIRCUIT
- Pulmonary arteries
- Pulmonary veins

SYSTEMIC CIRCUIT
- Systemic arteries
- Systemic veins

Capillaries in lungs
Right atrium
Right ventricle
Capillaries in trunk and lower limbs
Capillaries in head, neck, upper limbs
Left atrium
Left ventricle
Structures of the Heart Wall

- **Pericardium**
  - Visceral pericardium
  - Serous membrane
  - Supporting layer of areolar CT

- **Myocardium**
  - Layers of cardiac muscle tissue
  - CT, blood vessels, nerves

- **Endocardium**
  - Simple squamous epithelium
  - Continuous with mesothelium of blood vessels
Cardiac Muscle Tissue

- Striated
- Branched
- Interdigitated
- Centrally located nucleus
- Intercalated discs
- Fibrous skeleton
  - Collagen, elastin
  - Stabilizes cells
  - Provides support to valves
  - Distributes force of contraction
Superficial Anatomy of the Heart
Superficial Anatomy of the Heart

- Left common carotid artery
- Brachiocephalic trunk
- Ascending aorta
- Superior vena cava
- Auricle of right atrium
- Fat in coronary sulcus
- Right atrium
- Right ventricle
- Fat in anterior interventricular sulcus
- Left subclavian artery
- Arch of aorta
- Ligamentum arteriosum
- Descending aorta
- Left pulmonary artery
- Pulmonary trunk
- Auricle of left atrium

(a) Anterior (sternocostal) surface

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Superficial Anatomy of the Heart
Internal Anatomy of the Heart
Atria

- Thin wall
- Receiving chambers
- Derived from veins
- Auricles
  - folded extensions of the atria
  - increase volume
- Pectinate muscle
  - atrial muscle, “honeycomb” appearance
Ventricles

- Thick wall
- Pumping chambers
- Derived from arteries
- Trabeculae = “crossbars of flesh”

- **R ventricle**
  - thinner wall
  - pumps to lungs
  - moderator bands control the volume of the RV

- **L ventricle**
  - 2-3 X’s thicker than the RV
  - pumps to systemic circuit
Relaxed Ventricles

(a) Relaxed ventricles
Coronary Blood Vessels

- Left subclavian artery
- Left coronary artery (LCA)
- LEFT ATRIUM
- Circumflex branch of LCA
- Anterior interventricular branch of LCA
- Diagonal branch of LCA
- Great cardiac vein
- RIGHT ATRIUM
- Right coronary artery (RCA)
- Atrial branches of RCA
- Small cardiac vein
- Anterior cardiac veins
- Marginal branch of RCA

(a) Anterior view
Coronary Blood Vessels

- Circumflex branch of LCA
- Atrial branch of LCA
- Great cardiac vein
- Marginal branch of LCA
- Posterior vein of left ventricle
- Posterior left ventricular branch of LCA
- Coronary sinus
- Small cardiac vein
- Right coronary artery (RCA)
- Right marginal branch of RCA
- Middle cardiac vein

(b) Posterior view