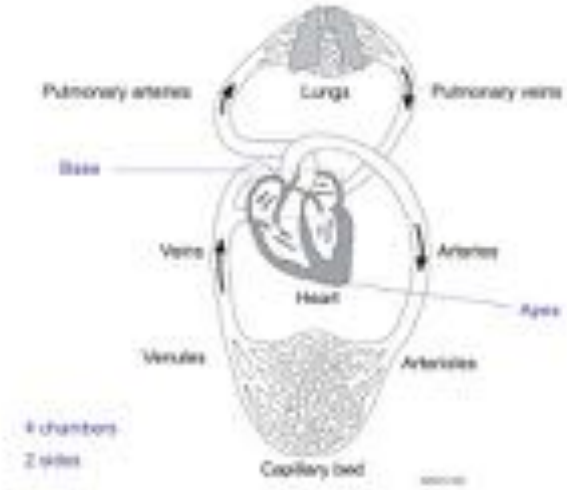
Hiccups

- Quick inspirations
- Spasmodic contractions of the diaphragm
- Irritation of;
    - Neurons in the phrenic nerve
    - The diaphragm itself
    - The respiratory centers in the brainstem

Lecture 5: Heart and Pericardium

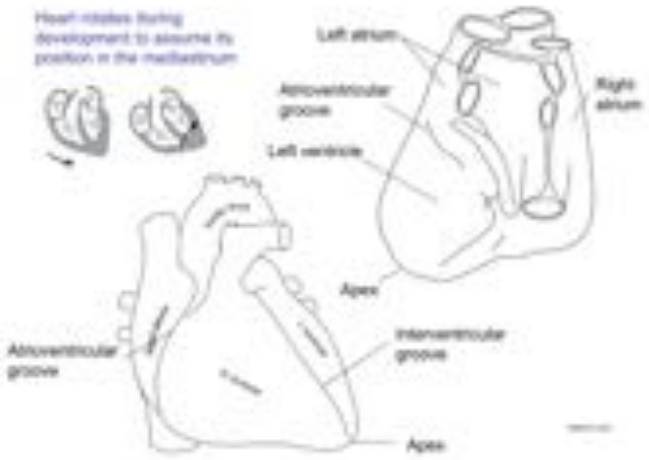
The heart

- Right side receives blood from the systemic circulation
- Atria= receiving chambers
- Ventricles = outflow chambers
    - Right side → pulmonary chambers
    - Left → Systemic
- Apex shifted to the left hand side
- Heart sits on the base, which is formed by the atria (largely the left atria)



Development

- Heart rotates during development to assume its position in the mediastinum
- Developed heart, assumed an off center and rotated position
    - Right side of the heart forward (when you open up the thorax you see most of the right side of the heart)



Number of grooves

- **Atrioventricular grooves:** run between the atrium and the interventricular groove
- **Posterior & Anterior interventricular groove:** between the ventricles

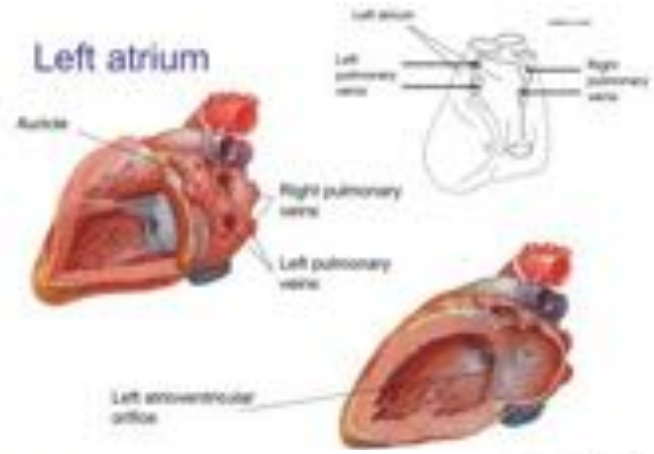
Most of the coronary arteries and veins run through the grooves

Right Atrium

- Receiving chamber of the heart
    - Receives blood from systemic circulation
        - Above: Superior vena cava (head, upper limbs, thorax)
        - Below: Inferior vena cava (below diaphragm)
- Anterior and lateral wall of right atrium to see the inside of the RA
    - Medial wall: smooth walled
    - Anterior: Rough, has muscular pectinati
    - Ridge between rough walled muscular pectinati and smooth wall called crista terminalis

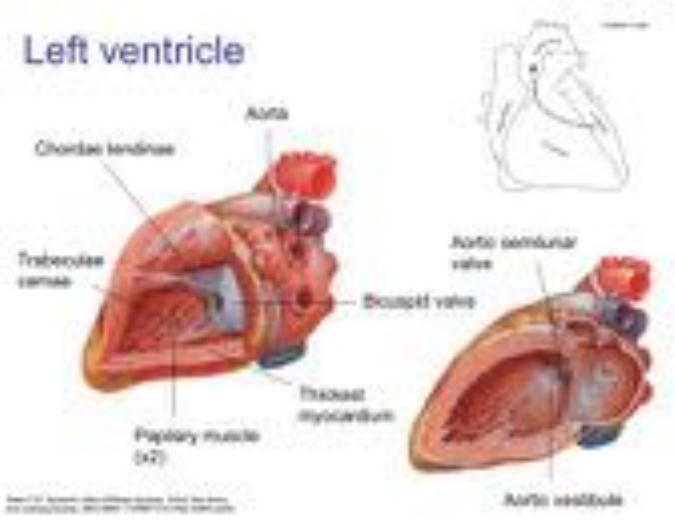
Left atrium

- Most forms the base of the heart
- 2 pulmonary veins coming into the heart
- Returning oxygenated blood into the heart
- Small depression from fossa ovalis
    - Left atrioventricular orifice



Left ventricle

- Left atrioventricular orifice is guarded by bicuspid valve (also referred to as mitral valve)
- Two valves; two papillary muscles and chordae tendineae are attached between the cusps and the papillary muscles
- Outflow tract takes blood out thorough the aorta
    - Leads into the ascending aorta
        - Is guarded by a valve; guarded by semi-lunar valve (aortic valve)
- Functions of the semi lunar valves are essentially the same on both sides of the heart
- Thickest myocardium



Fetal heart and circulation

- In the fetal circulation, you do not need blood to go through the lungs
- 2 features that allow blood to bypass the lungs;
    - Foramen ovale
        - In the area, that adults have fossa ovalis (depression in interatrial septum)
            - Allows blood coming in from the systemic circulation to go straight to the LA and then through the ventricle into circulation
        - Perfectly positioned to receive blood from the IVC
        - As blood starts coming back into LA - you get increased pressure leading to LA closing
    - Ductus arteriosus
        - Between pulmonary trunk and aorta
        - However, blood coming from the SVC finds it difficult to do sharp turn through foramen ovalis and therefore some will end up in RV
        - Ductus arteriosus sits at the very top end of pulmonary trunk and bottom end of aorta
            - Allows any blood to end up in the aorta
        - Remains in adult as ligamentum arteriosus
            - Change at birth; first expansion of lungs results in closure of ductus arteriosus and foramen ovale
                - As the lungs expand they release hormones, which act on smooth muscle to make it constrict and close
                    - This is accompanied by blood, as blood starts coming back into LA you get increased pressure leading to LA closing