

11

PART A

The Cardiovascular System Day One!

PowerPoint® Lecture Slide Presentation by Jerry L. Cook, Sam Houston University



ESSENTIALS OF HUMAN ANATOMY & PHYSIOLOGY

EIGHTH EDITION

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The Cardiovascular System

- A closed system of the heart and blood vessels
 - The heart pumps blood
 - Blood vessels allow blood to circulate to all parts of the body
- The function of the cardiovascular system is to deliver oxygen and nutrients and to remove carbon dioxide and other waste products

The Heart

- Location
 - Thorax between the lungs
 - Pointed apex directed toward left hip
- About the size of your fist

The Heart

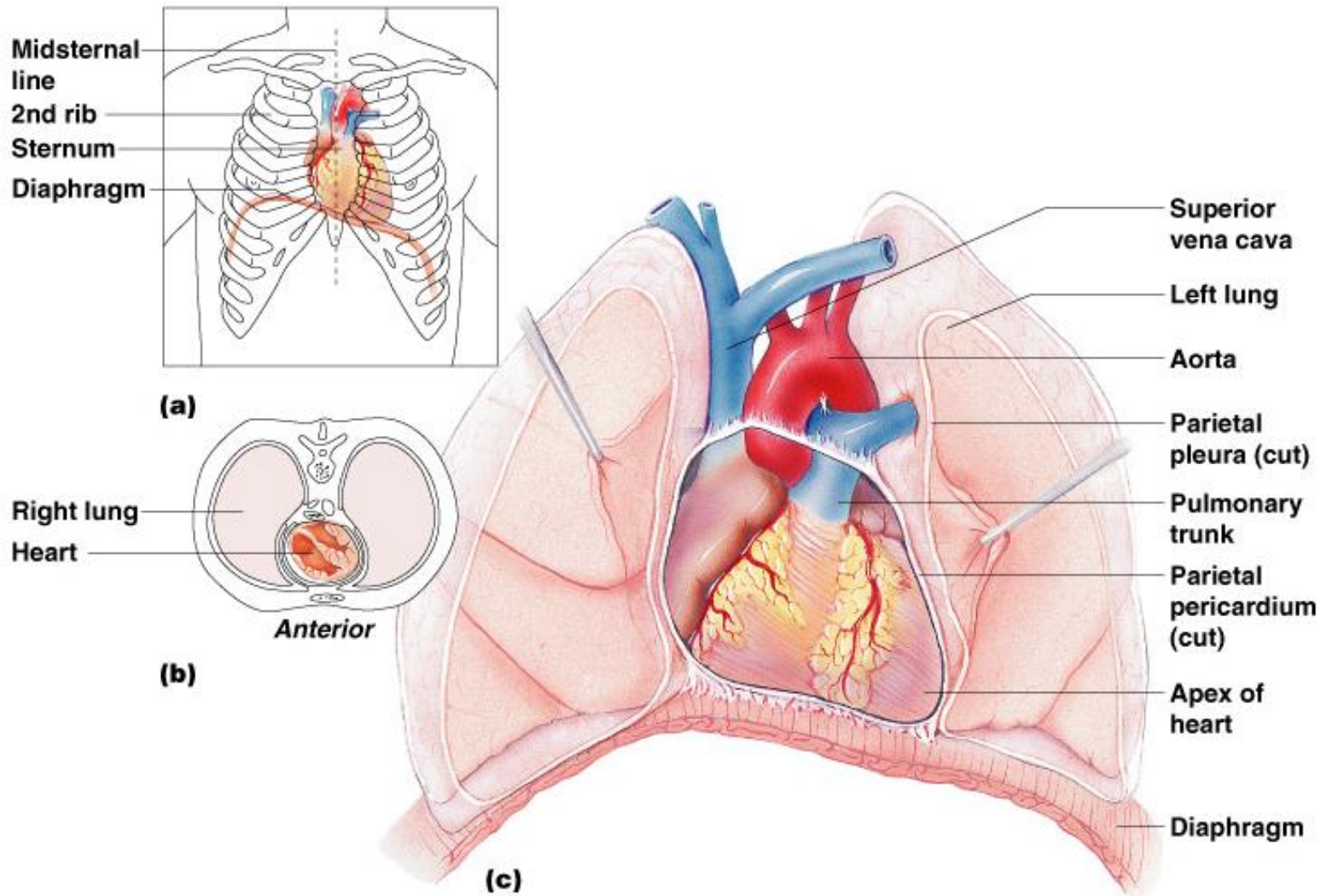


Figure 11.1

The Heart: Coverings

- Pericardium – a double serous membrane
 - Visceral pericardium (Next to heart/part of heart wall)
 - Parietal pericardium (Outside layer)
- Serous fluid fills the space between the layers of pericardium (reduces friction)

The Heart: Heart Wall

- Three layers
 - Epicardium
 - Outside layer
 - This layer is the visceral pericardium
 - Connective tissue layer
 - Myocardium
 - Middle layer
 - Mostly cardiac muscle
 - Endocardium
 - Inner layer
 - Endothelium

External Heart Anatomy

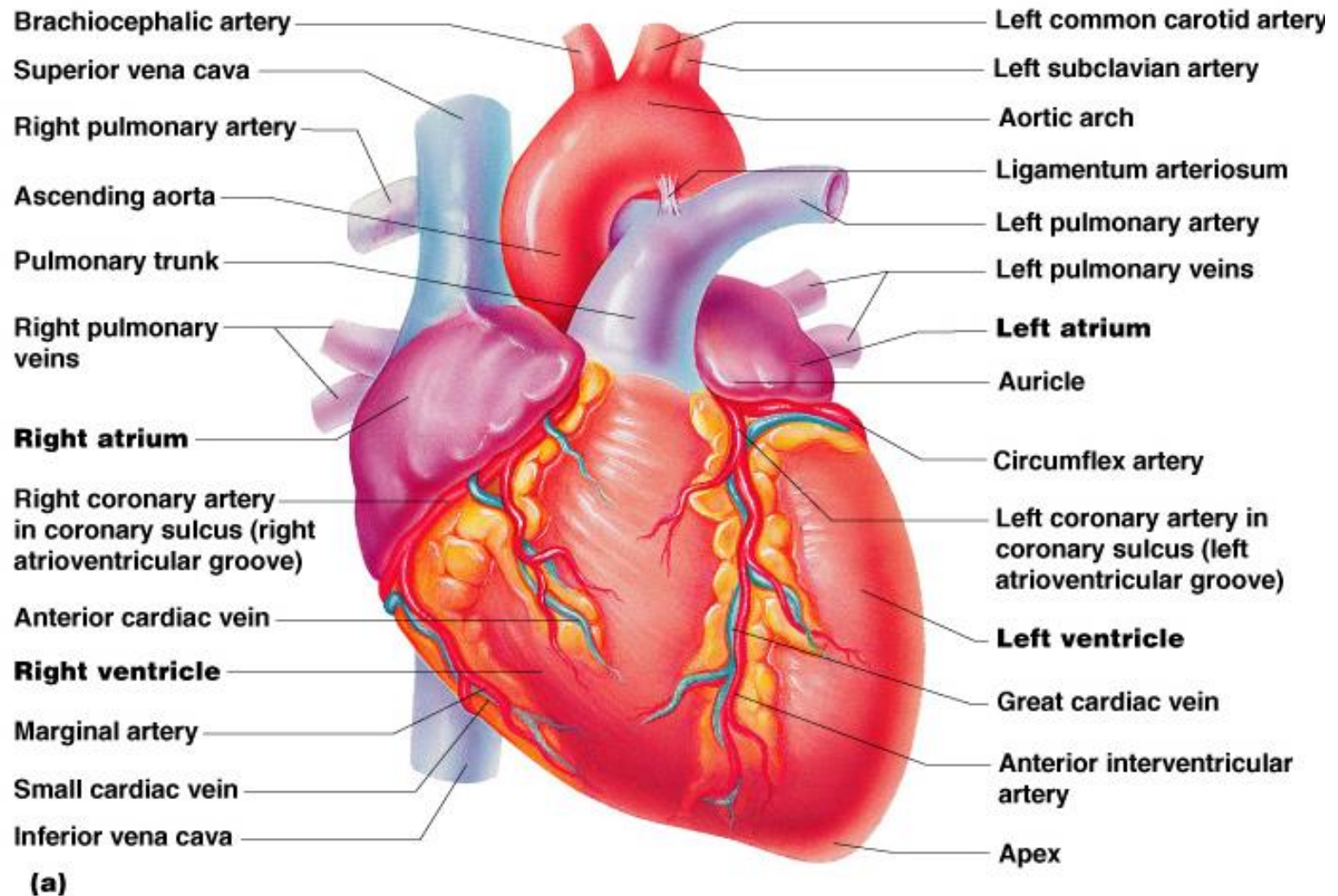


Figure 11.2a

The Heart: Chambers

- Right and left sides act as separate pumps
- Four chambers
 - Atria
 - Receiving chambers
 - Right atrium
 - Left atrium
 - Ventricles
 - Discharging chambers
 - Right ventricle
 - Left ventricle

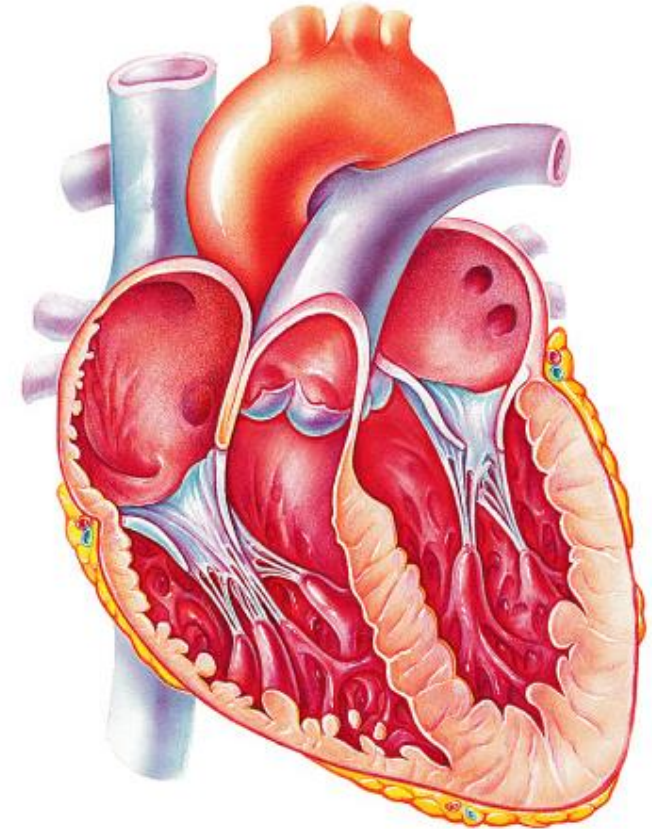


Figure 11.2c

Blood Circulation

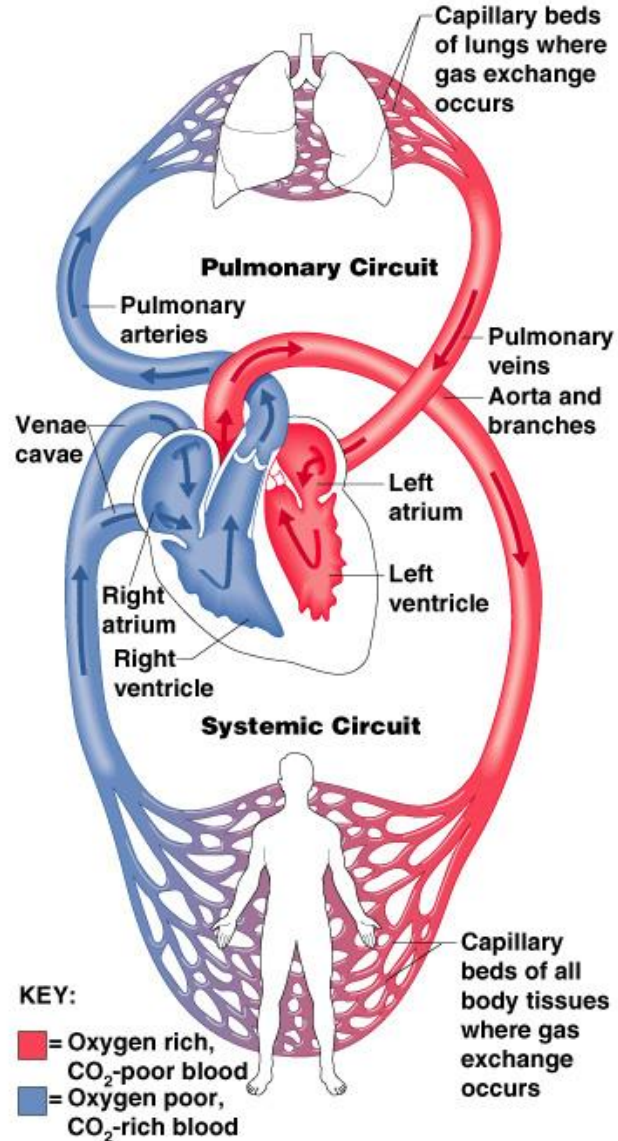


Figure 11.3

The Heart: Valves

- Allow blood to flow in only one direction
- Four valves
 - Atrioventricular (AV) valves – between atria and ventricles
 - Bicuspid/mitral valve (left)
 - Tricuspid valve (right)
 - Semilunar valves between ventricle and artery leaving heart
 - Pulmonary semilunar valve
 - Aortic semilunar valve

The Heart: Valves

- Valves open as blood is pumped through
- Held in place by chordae tendineae (“heart strings”)
- Close to prevent backflow

Operation of Heart Valves

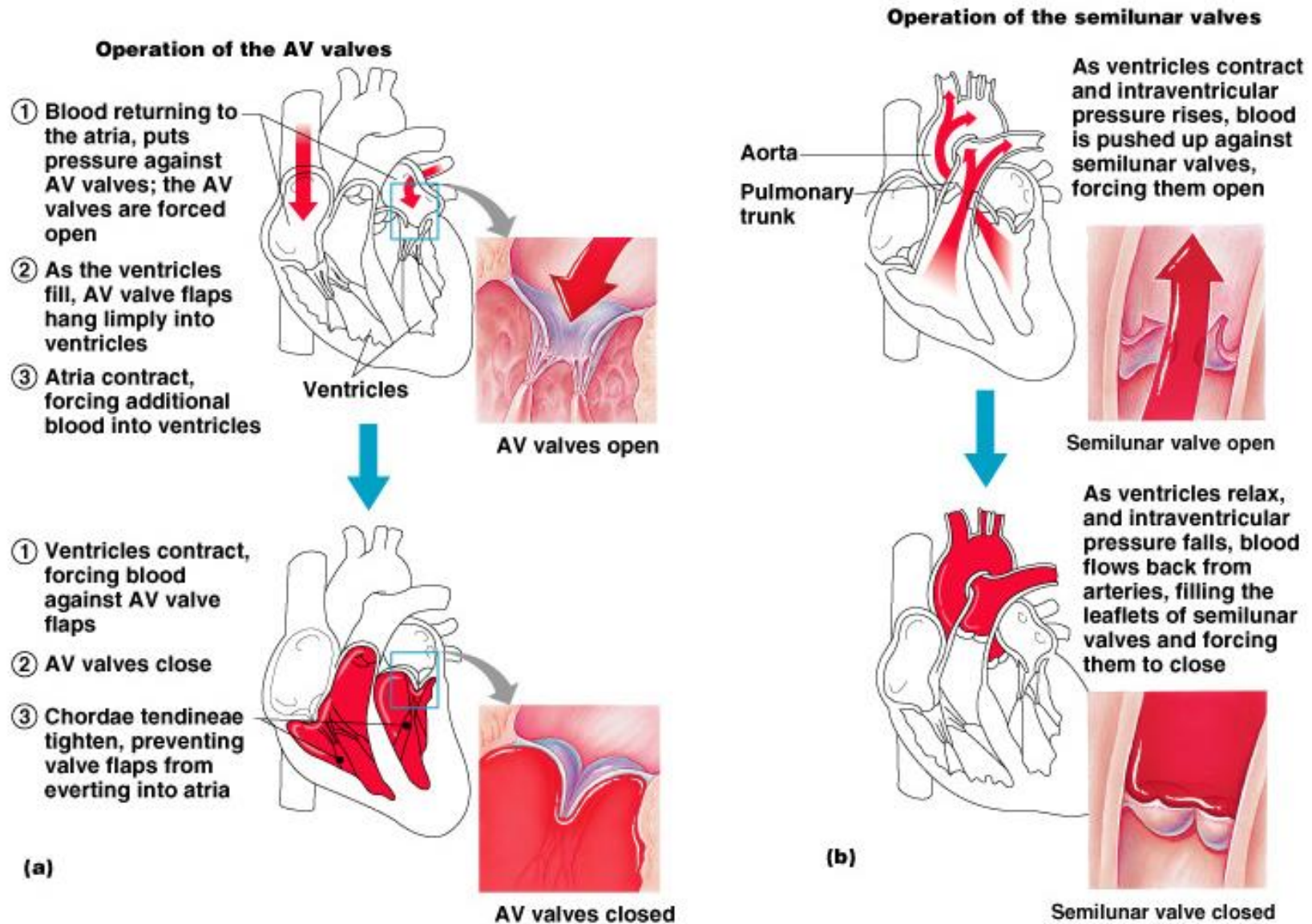


Figure 11.4

The Heart: Associated Great Vessels

- Aorta (artery)
 - Leaves left ventricle (heads out to body)
- Pulmonary arteries
 - Leave right ventricle (heads out to lungs)
- Vena cava (veins)
 - Enters right atrium (coming back from body)
- Pulmonary veins (four)
 - Enter left atrium (coming back from lungs)

Coronary Circulation

- Blood in the heart chambers does not nourish the myocardium
- The heart has its own nourishing circulatory system
 - Coronary arteries
 - Cardiac veins
 - Blood empties into the right atrium via the coronary sinus