

## UNIT VI: THE THORACIC VISCERAL SYSTEMS

### Instructional Objectives:

At the completion of this unit the student should be able to:

1. Recognize the derivation of key examples of anatomical terms used in this unit.
2. List the major components of the circulatory system, describing their general functions. (See notes on blood vessels.)
3. Review the constituents of blood and the major functions of each.
4. Identify the histological structures of blood vessels.
5. Describe the layers of the pericardium and the three layers of the heart wall.
6. Identify from a model the important structures of the heart. (See list.)
7. Trace the circulation of the blood through the heart.
8. Identify the major arteries and veins of the pulmonary and systemic circulations that are connected to the heart. (See list.)
9. Trace the flow of the coronary circulation, both arterial supply and venous drainage. (See list.)
10. List the structural components and describe the path of electrical excitation through the conductive tissue of the heart.
11. Locate and identify the major arteries supplying the extremities, thoracic and abdominopelvic walls, head and neck, and the major organs of the thoracic and abdominal visceral systems. (See list.)
12. Locate and identify the major veins draining the extremities, thoracic and abdominopelvic walls, head and neck, and the major organs of the thoracic and abdominal visceral systems. (See list.)
13. Identify the major arteries supplying the brain, including the circle of Willis with component arteries identified. (See list.)
14. Describe the role of dural sinuses and their relationship to veins draining the brain.
15. Identify from a model the important cardiovascular structures of the fetus. (See list.)
16. Describe the general structure of the parts of the lymphatic system, including lymphatic capillaries, lymphatic ducts, nodes and lymphoid organs. (See notes on lymph vessels.)
17. Describe the lymphatic drainage and location of major lymph nodes of the extremities, the body wall, the head and neck and visceral systems.
18. Describe the basic functions of the respiratory system.

19. Trace the route of air through the conducting division from nasal cavity to the terminal bronchioles, and into the respiratory division of alveolar ducts, sacs and alveoli to the capillaries of the pulmonary circulation.
20. Identify the layers and the general functions of the pleurae.
21. Explain the mechanics of breathing.
22. Identify from a model the important structures of the respiratory system. (See list.)

### LIST

#### Objectives 6 and 8

#### CARDIOVASCULAR STRUCTURES

atrium/atria (2)  
 ventricles (2)  
 auricles (2)  
 interatrial septum  
 interventricular septum  
 superior vena cava  
     brachiocephalic veins (2)  
     azygos vein  
 inferior vena cava  
 pectinate muscle  
 fossa ovalis  
 right atrioventricular valve (tricuspid)  
 chordae tendineae  
 papillary muscles  
 trabeculae carneae  
 pulmonary semilunar valve  
 pulmonary trunk  
     left pulmonary artery  
     right pulmonary artery  
 pulmonary veins (4)  
 left atrioventricular valve (bicuspid, mitral)  
 aortic semilunar valve  
 aorta  
     brachiocephalic trunk  
     left common carotid artery  
     left subclavian artery  
 ligamentum arteriosum

## Objective 9

### CORONARY CIRCULATION

right coronary artery  
    right marginal artery  
    posterior interventricular artery  
left coronary artery (**not visible on heart model**)  
    circumflex artery  
    anterior interventricular artery  
small cardiac vein  
great cardiac vein  
middle cardiac vein  
coronary sinus

## Objectives 11-13

### Arteries

aorta  
brachiocephalic trunk  
subclavian artery  
axillary artery  
brachial artery  
radial artery  
ulnar artery  
superficial palmar arches  
digital arteries  
common carotid artery  
external carotid artery  
internal carotid artery  
vertebral artery  
basilar artery  
cerebral arterial circle (circle of Willis)  
    posterior cerebral artery  
    internal carotid artery  
    posterior communicating artery  
    anterior cerebral artery  
    anterior communicating artery

abdominal aorta

celiac artery/trunk

superior mesenteric artery

renal artery

gonadal artery

inferior mesenteric artery

common iliac artery

internal iliac artery

external iliac artery

femoral artery

popliteal artery

anterior tibial artery

posterior tibial artery

fibular artery

### Veins

cephalic vein

subclavian vein

internal jugular vein

external jugular vein

brachiocephalic vein

superior vena cava

azygos vein

hemiazzygos vein

accessory hemiazzygos vein

small saphenous vein

popliteal vein

great saphenous vein

femoral vein

external iliac vein

internal iliac vein

common iliac vein

inferior vena cava

gonadal vein

renal vein

### Objective 15

#### FETAL STRUCTURES

ductus arteriosus

foramen ovale

umbilical vein

umbilical arteries

## Objective 22

### RESPIRATORY SYSTEM

pharynx

nasopharynx

oropharynx

laryngopharynx

larynx

thyroid cartilage

cricoid cartilage

epiglottis

vestibular ligaments

vocal ligaments

trachea

primary bronchi

lungs

lobes (superior, middle, inferior)

costal surface

mediastinal surface

cardiac notch

## NOTES – VESSELS

### Arteries

1. Always carry blood away from the heart
2. Usually carry oxygen (exceptions: pulmonary arteries carry carbon dioxide to the lungs; umbilical arteries carry carbon dioxide to placenta)
3. Thicker muscle wall with elastic connective tissue
  - a. Withstand high pressure of blood that results from each contraction of ventricles
  - b. Stretchy, to accommodate each surge of blood
  - c. Pulse is what is felt as an artery stretches to accommodate the increased blood pressure from ventricle contractions
  - d. The lumen – round and smaller in diameter than similarly sized vein

### Veins

1. Always carry blood toward the heart
2. Usually carry carbon dioxide (exceptions: pulmonary veins carry oxygen from the lungs to the heart; umbilical veins carry oxygen to the fetus)
3. Thinner muscle wall, little to no elastic connective tissue
  - a. Low blood pressure
  - b. Blood movement depends on skeletal muscle contractions squeezing the veins
  - c. Valves, flaps of tissue from the inner layer of cells, close behind the blood as it moves through a vein so the blood will not backflow
  - d. The lumen – flattened and larger in diameter than similarly sized artery

### Capillaries

1. Between arteries and veins, linking them to deliver oxygen and nutrients to cells and remove carbon dioxide and wastes from the cells
2. Only one cell layer thick, for efficient exchange between the capillary and cells
3. Form capillary beds, a network of capillaries close to body cells

### Lymph Vessels

1. A system of vessels separate from the cardiovascular system
2. Built like veins, depend on muscle contractions to move contents
3. Functions
  - a. Originate near body cells to collect tissue fluid that leaked out of capillaries; within the lymph vessels now the fluid is called lymph
  - b. Return lymph to the bloodstream by connecting to veins near the heart; now the lymph is called plasma again
  - c. Lymph nodes along the vessels contain large phagocytes to clean the lymph before it is returned to the blood
  - d. Collect digested fats from the villi of the small intestine and take them to the bloodstream for circulation to the liver for processing or to other body cells
  - e. Help in general defense with phagocytes in the nodes and circulating in the vessels
  - f. Help in immunity with lymphocytes (B- and T-cells) in vessels and lymphoid tissues: lymph nodes, spleen, tonsils; thymus gland (in children matures the first T-cells)
4. Named ducts/parts
  - a. Thoracic duct  
Cisterna chyli
  - b. Right lymphatic duct