Top Chronic Diseases

MALES

- 1. Heart Disease
- 2. Cancer
- 3. Cerebral Vascular Accidents (stroke)
- 4. Chronic Lower Respiratory Diseases
- 5. Diabetes

FEMALES

- 1. Heart Disease
- 2. Cancer
- 3. Cerebral Vascular Accidents
- 4. Chronic Lower Respiratory Diseases
- 5. Alzheimers
- 6. Diabetes

Diet = “way of life,” in Latin

- Genetics
- Smoking
- Obesity
- Nutrition
- Activity level
- Stress
- Sunlight

Contributing Factors…

The Make – Up …

- Cell(s) → Tissue(s) → Organ(s) → Organ System(s) → Organism
- Each has its own function; together, make up overall function for that system
- Goal : maintain ***homeostasis***

- Respiratory System →
  - Contains trachea, bronchi, lungs
  - Each performs a particular function
    - Trachea: transports air btwn throat & bronchi
    - Bronchi: transports air btwn trachea and smaller tubes in lungs
    - Lungs: site of gas diffusion btwn air and bloodstream
  - Together, overall function
    - O_2 from external enviro → bloodstream
    - Removal of waste pdt, CO_2

Example…

Body Systems (11)

- * Integumentary
- Skeletal
- Muscular
- Nervous
- Endocrine
- Cardiovascular
- * Digestive
- Urinary
- Reproductive
- Lymphatic
- * Respiratory

  - **Systems involved with excretion**

Function Words

- Excretion
- Protection
- Regulation
- Communication
- Production/ Formation
- Support
- Breakdown
- Filtration
- (re)Absorption
- Exchange
- Storage
- Movement

Have Chapter 5 read for tomorrow*

HOMEOSTASIS

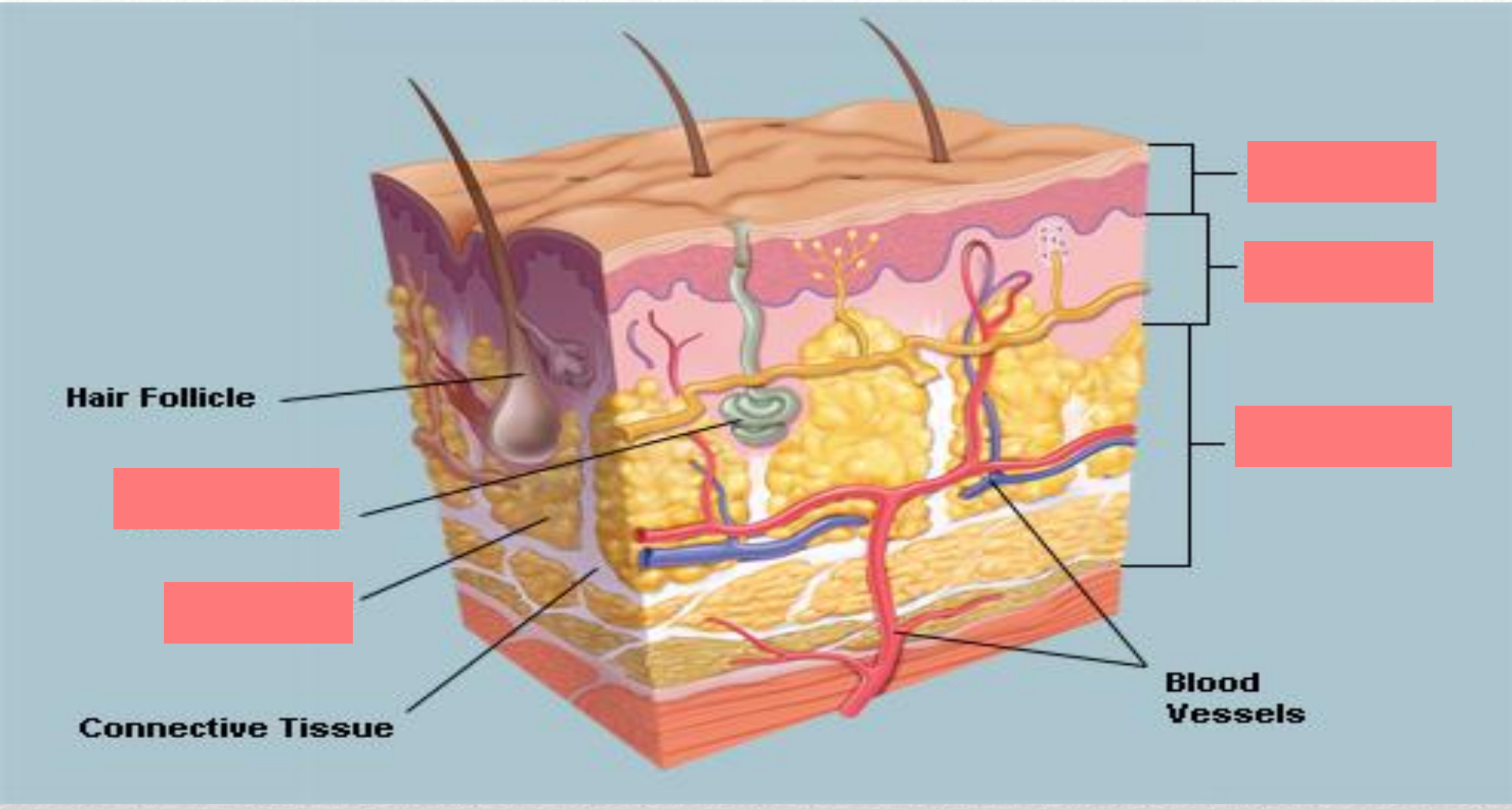
- A condition of equilibrium, or physiological stability, of body systems, in which the internal environment of the body remains relatively constant

Chapter 5:

Body System Overview

Integumentary System

- Primary fxn → **Protection** btwn external & internal environment via a physical barrier for fluid loss, physical injury, UV light, invasion of microbes, etc., **Communication** as sensory receptors allow skin to react to stimuli (heat, cold, touch, pain) and relay info to CNS, **Excretion** of metabolic waste products via sweat/exocrine glands, **Production** of Vitamin D when exposed to UV light, **thermoRegulation** due to acting as an insulating barrier (sweat/freeze)
- Primary organs → skin, accessory organs (sweat/oil glands, blood vessels, receptors)
- *skin = integument or cutaneous membrane
- *epidermis (waxy, prot. coat of dead cells), dermis (supports epi.), hypodermis/subcutaneous (fat layer; insulating blanket, food reserve
- Doctors → dermatologist (derma = skin)



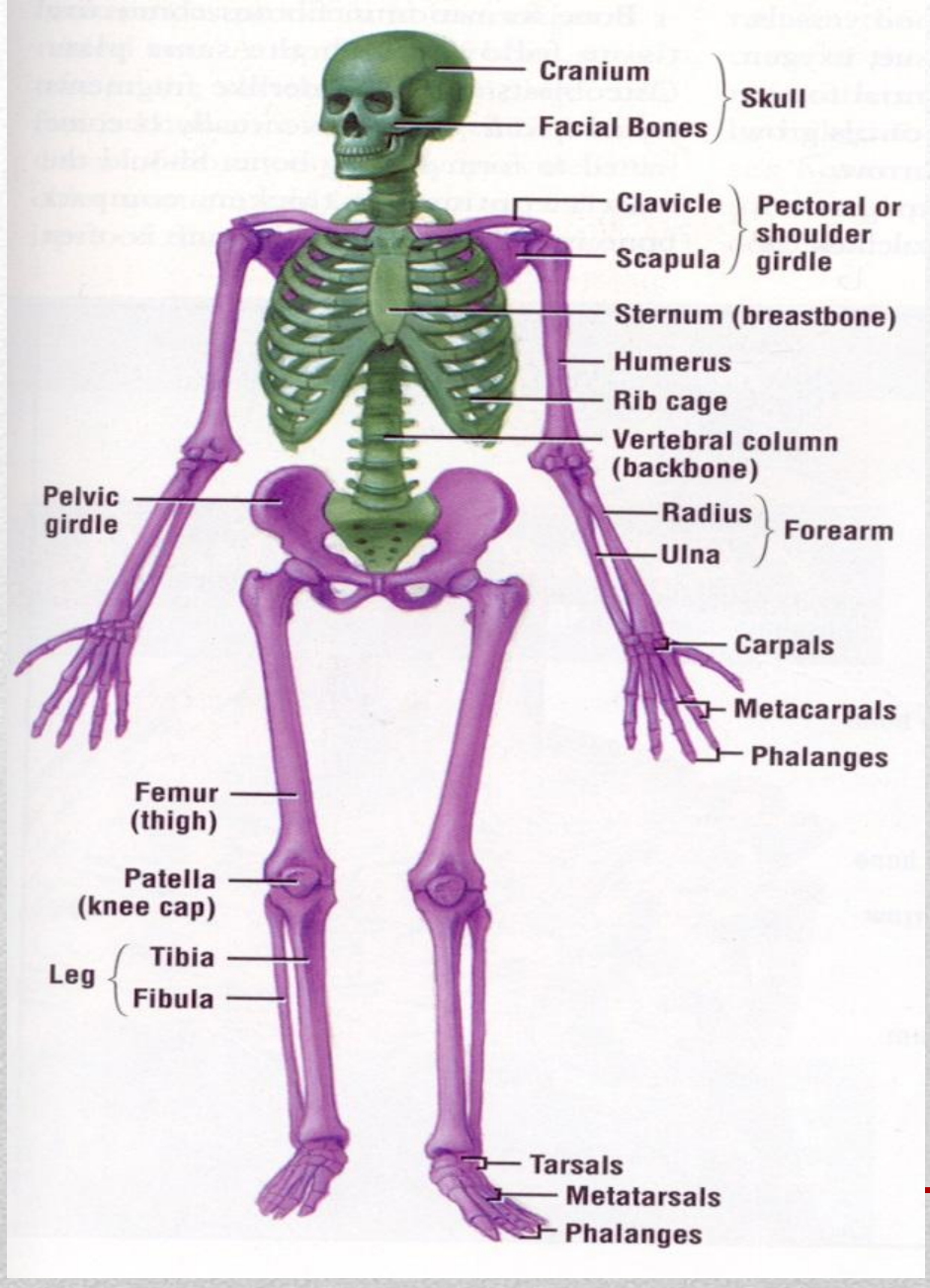
Layers of skin/integument

IN PACKET:

Complete Integumentary System questions 1 – 11, Page 69

Skeletal System

- Primary fxn → **Protection** of internal organs and body structures, **Support** for skeletal muscles as they attach to bones, **Storage** site of calcium/phosphate minerals, **Movement** as bones act as levers for mechanical advantages, **Production** of blood cells within bone marrow
- Primary organs → bones: radius, ulna, femur, tibia, fibula, humerus, sacrum, ribs, etc. (each bone = an organ!)
- *bones, joints, and tissues form supportive frame → *skeleton*
- *206 bones: *axial* (vertical axis – skull, vertebral column, thoracic cage, sacrum) or *appendicular* skeleton (lateral to vertical axis – shoulder girdle, upper limbs, pelvic girdle, lower limbs
- **joints/articulations* = junctions btwn bones ; ligaments extend across joints, connecting bone to bone
- Doctors → orthopaedic (ortho – straight/align ; pedic – children; expanded past children, to all musculoskeleton disorders -- bones, joints, ligaments, tendons, muscles), radiologist, rheumatologist (joints, soft tissues), chiropractor (alignment)



AXIAL:
skull, vertebral column, thoracic cage, sacrum (green)

APPENDICULAR:
shoulder girdle, upper limbs, pelvic girdle, lower limbs (purple)

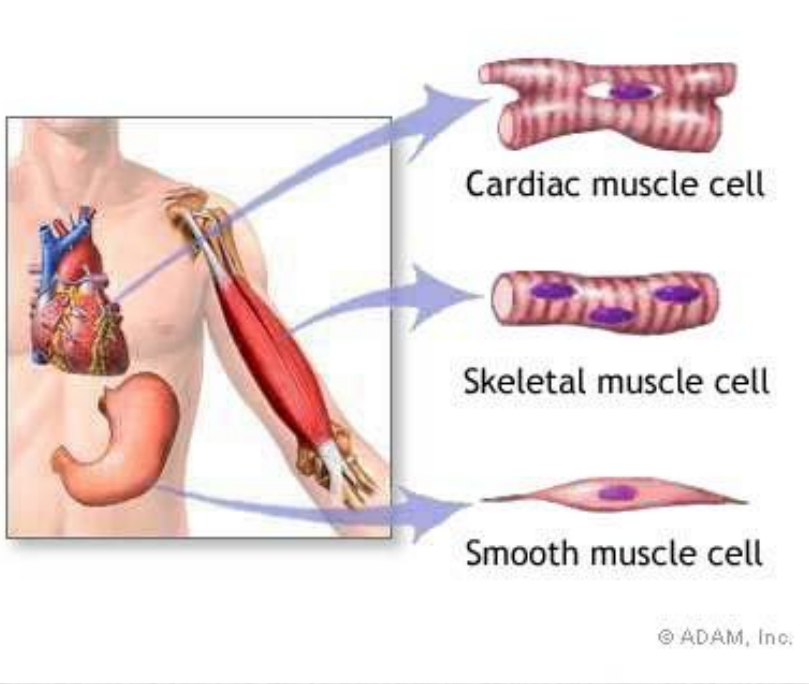
Axial versus Appendicular

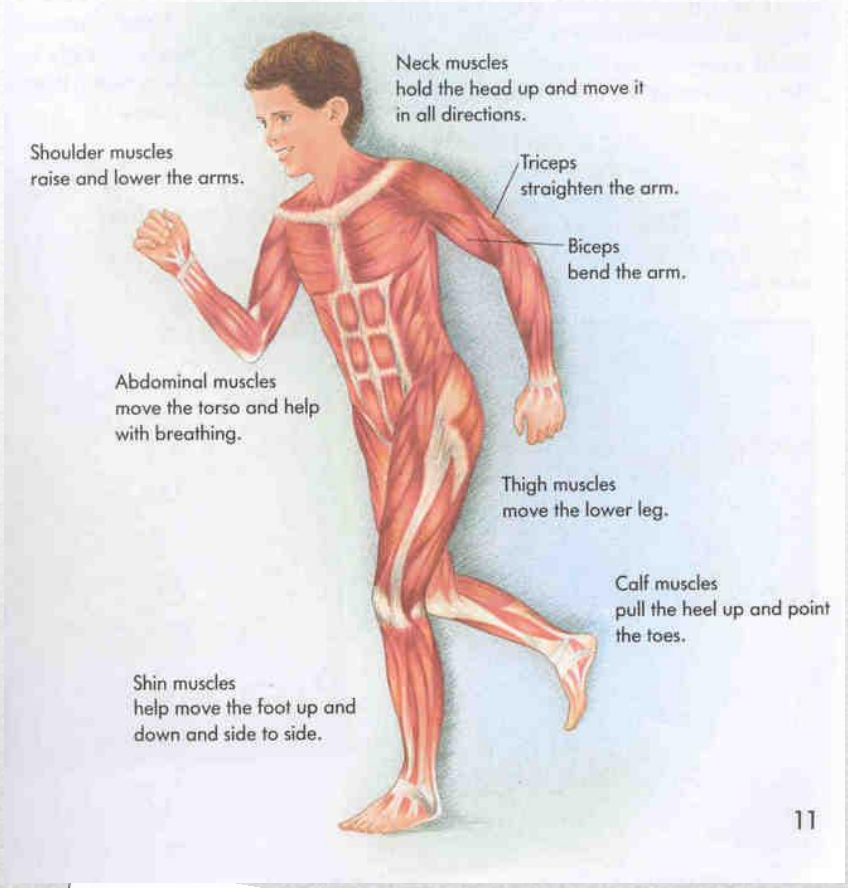
IN PACKET:

Complete Skeletal System questions 12 - 23, Page 70

Muscular System

- Primary fxn → **Movement** of muscles as they contract, shorten, and pull on bones to move body parts, **Production** of heat as a by-product of movement, **Support** to hold body in an upright position due to a rigid connection between skeletal muscles and bones, **Protection** of internal organs
- Primary organs → *muscles that attach to bones (skeletal muscles)* ex: biceps, triceps, glutes, deltoids, etc.
- * +500 muscles, each is a distinct organ
- *single muscle made up of units of cells = bundles; when all bundles shorten, entire muscle contracts
- **tendon* = attach muscle to bone
- Doctors → orthopaedic (ortho – straight ; pedic – children; expanded past children, to all musculoskeleton disorders -- bones, joints, ligaments, tendons, muscles), physical therapist, rheumatologist





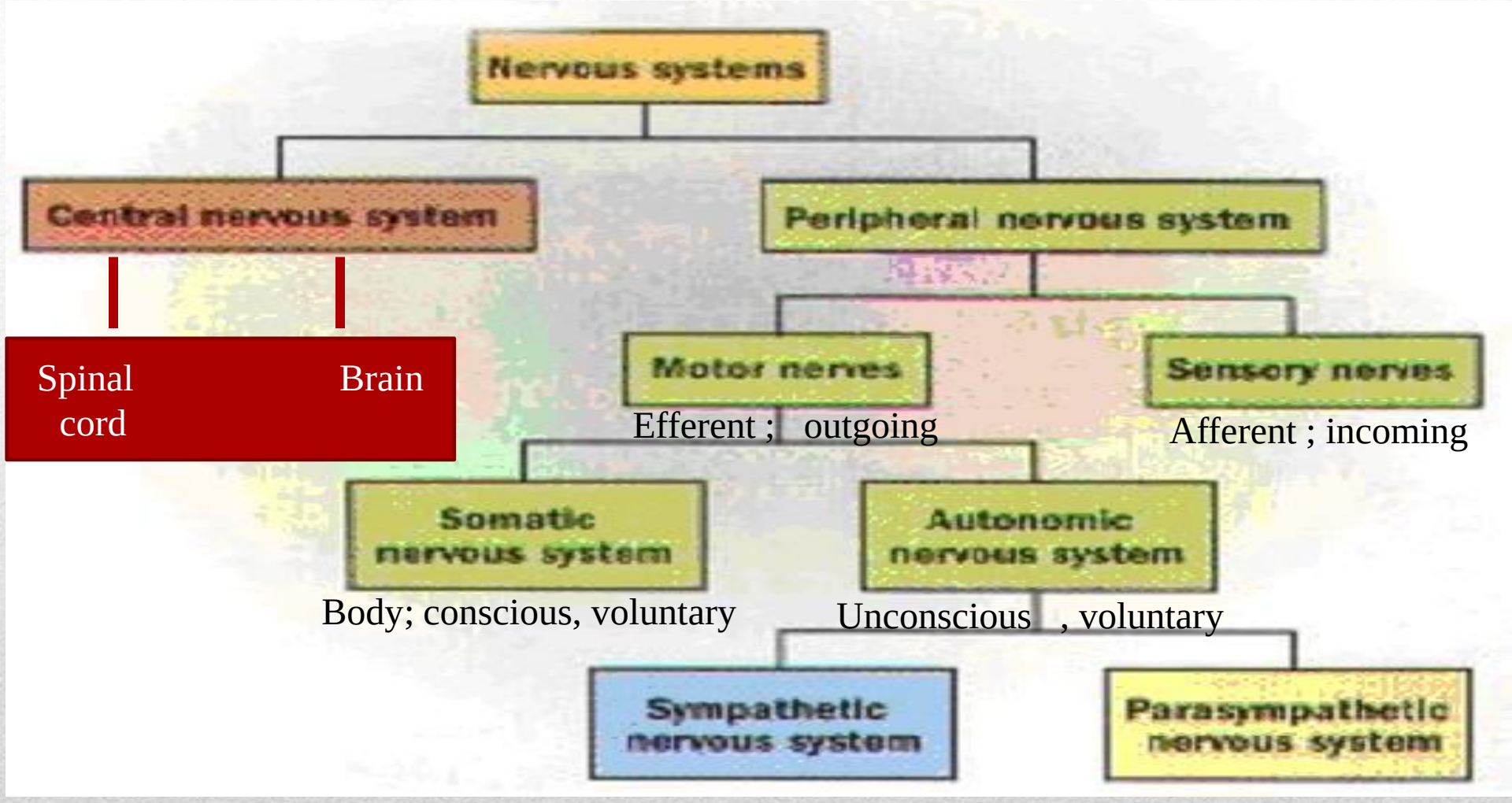
Muscle Types

IN PACKET:

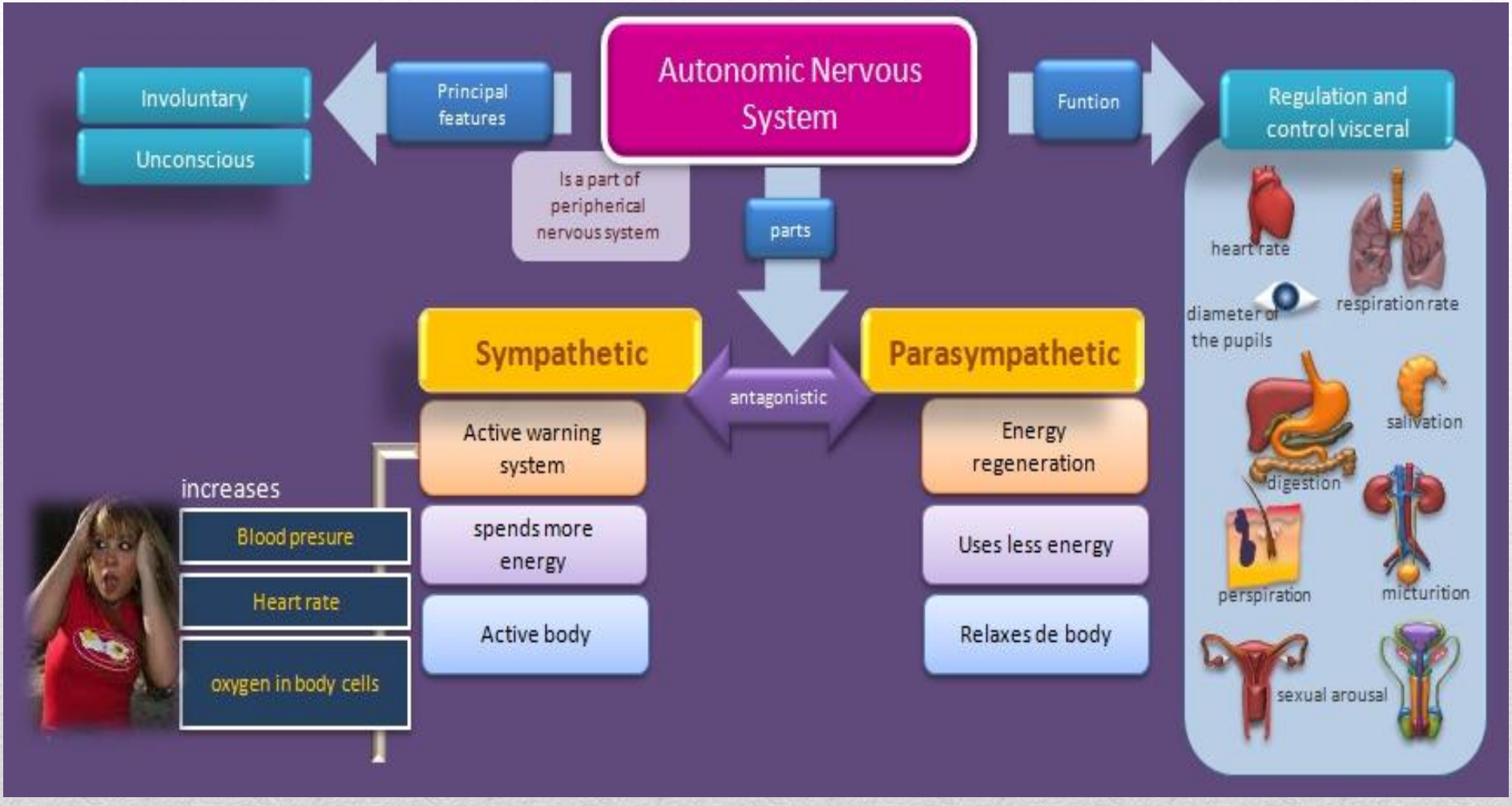
Complete Muscular System questions 24 - 30, Page 71

Nervous System

- Primary fxn → **Communication** between the external environment and the body via nerve impulses
- Primary organs → brain, spinal cord, nerves, special sense organs
  - 2 categories: ***CNS*** (spinal cord and brain), ***PNS*** (nerves btwn CNS and structure in which they terminate/begin)
  - PNS → afferent/sensory (TO) *or* efferent/motor portions (FROM)
    - w/in efferent → somatic (conscious ctrl) & autonomic (unconscious ctrl)
- Opposite of endocrine → * fast transport of nerve impulses/electrochemical signals via neurons; * lead to short term results
- Doctors → neurologist (neuro – nerve)



NERVOUS SYSTEM



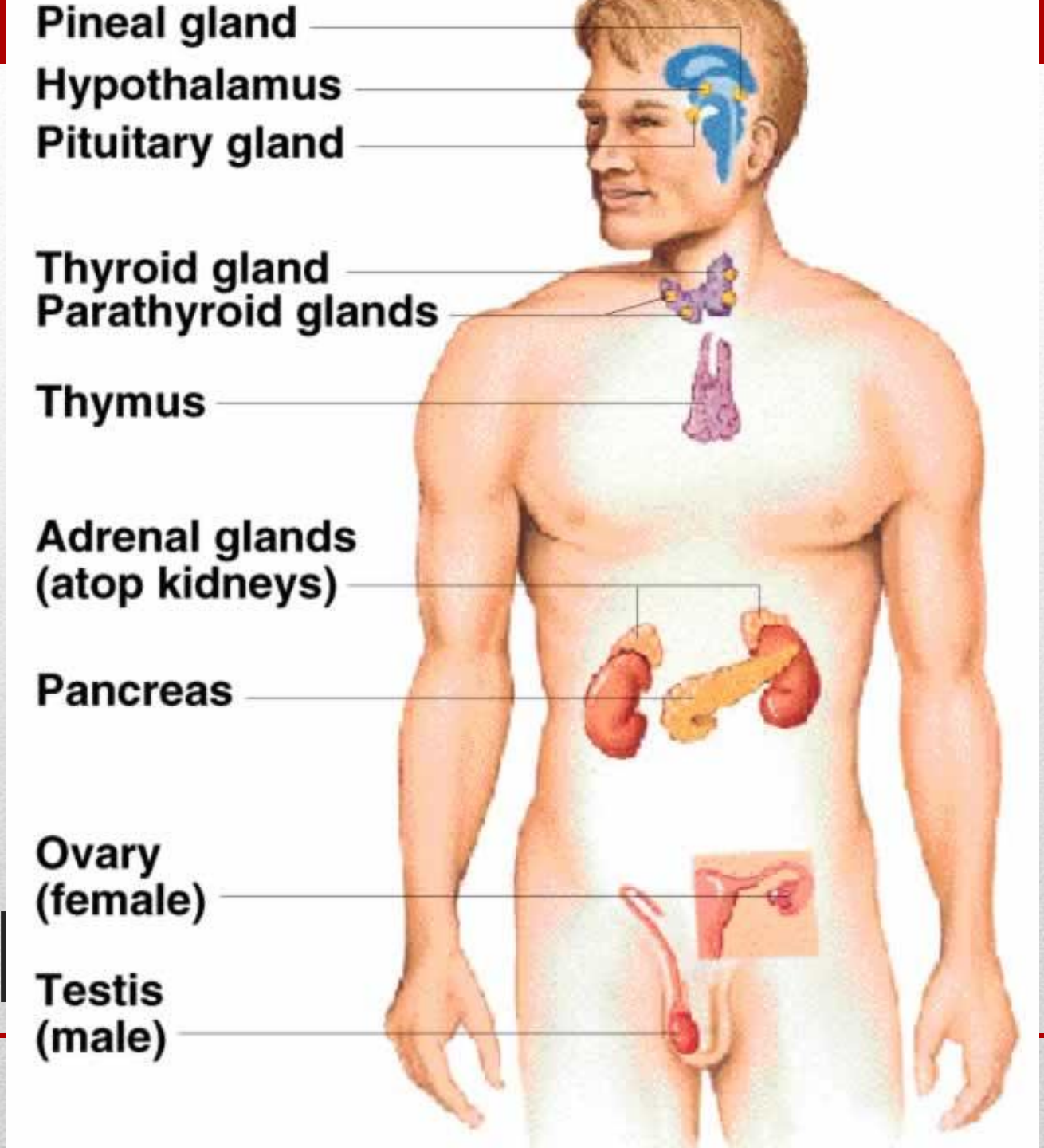
NERVOUS SYSTEM

IN PACKET:

Complete Nervous System questions 31 - 38,
Page 71-72

Endocrine System

- Primary fxn →**Communication** via chemical messengers that are released/secreted
- *endocrine – glands w/o ducts (vs. exocrine – w/ducts; sweat glands)
- Pdts secreted: *hormones* ; via diffusion into bloodstream ; come in contact w/specific cell(s) (AKA "*target*")w/in which they react w/ – results in change in body fxn
- Diff. glands release diff. hormones (p.120 for ex's)
- Primary organs → pituitary gland, thyroid gland, adrenal, pancreas, gonads (sex glands), thymus, pineal, stomach, kidneys
- Opposite of nervous → * slow transport of hormones ; * long-lasting results
- Doctors →endocrinologist (endo – within; deals with hormones, secretions, growth/development – i.e. thyroid gland – regulates metabolic rate, diabetes – insulin levels in pancreas)


Pineal gland
Hypothalamus
Pituitary gland
Thyroid gland
Parathyroid glands
Thymus
Adrenal glands
(atop kidneys)
Pancreas
Ovary
(female)
Testis
(male)

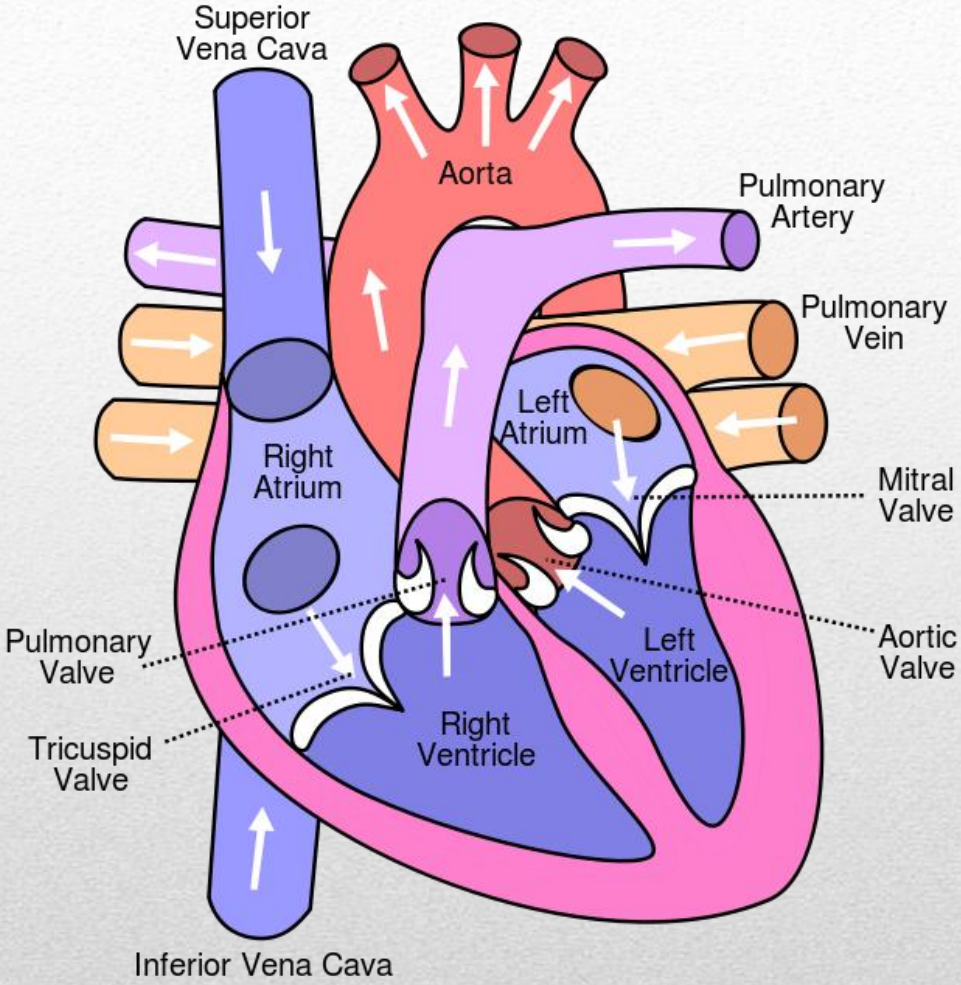
IN PACKET:

Complete Endocrine System questions 39 - 52, Page 73

Cardiovascular System

- Primary fxn → **Movement** of blood throughout body so every cell can obtain oxygen and nutrients (and removal of carbon dioxide and water), **Storage** of interstitial fluid in capillaries
- Primary organs (**blood circulation pathway**) → heart, blood vessels
  - *Arteries* (AWAY) – become smaller in diameter, branch more (*capillaries*) *site of gas exchange w/bloodstream
  - *Veins* (TO) – become larger and fewer
  - Heart → 4 chambers: upper *atria* (collect blood) lower *ventricles* (exiting blood)
- Similar to lymphatic → system of tubes carry liquid containing materials that are propelled by muscular organ (heart) to/from all body parts
- Doctors → cardiologist (cardio – heart)

- *lymphatic + cardiovascular = circulatory system

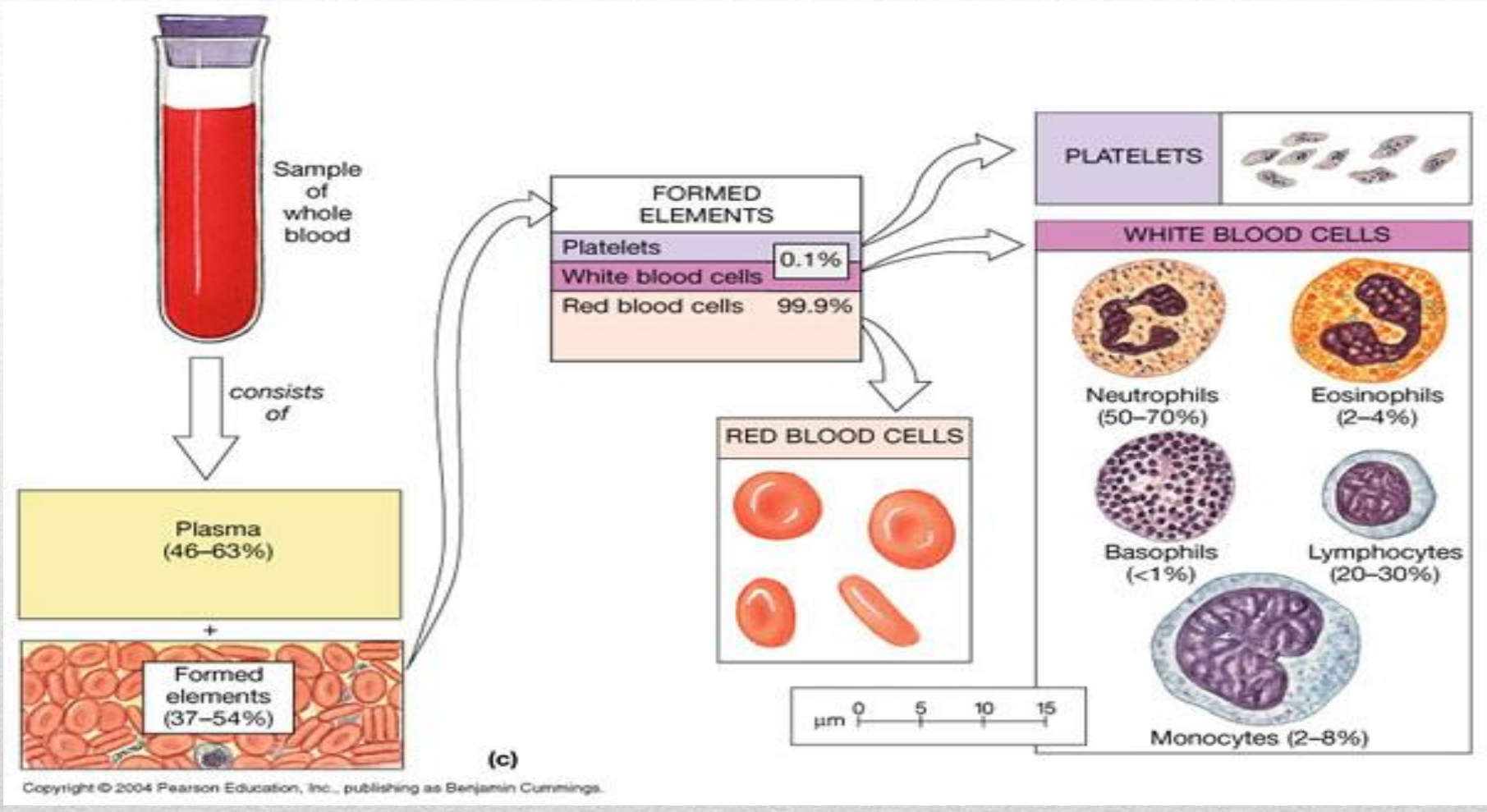


Pathway of Blood Circulation

Cardiovascular System (continued)

- ***Blood*** – formed elements suspended in liquid (plasma)
- 3 types of formed elements →
  - RBC , **erythrocytes**, transport O2/CO2 gases
  - WBC, **leukocytes**, protect body from infection and disease
  - Platelets, **thrombocytes**, help form blood clots for minimizing fluid loss during an injury

*_plasma_ = clearish/yellow -- mostly water w/proteins, nutrients, gases, enzymes, hormones suspended within



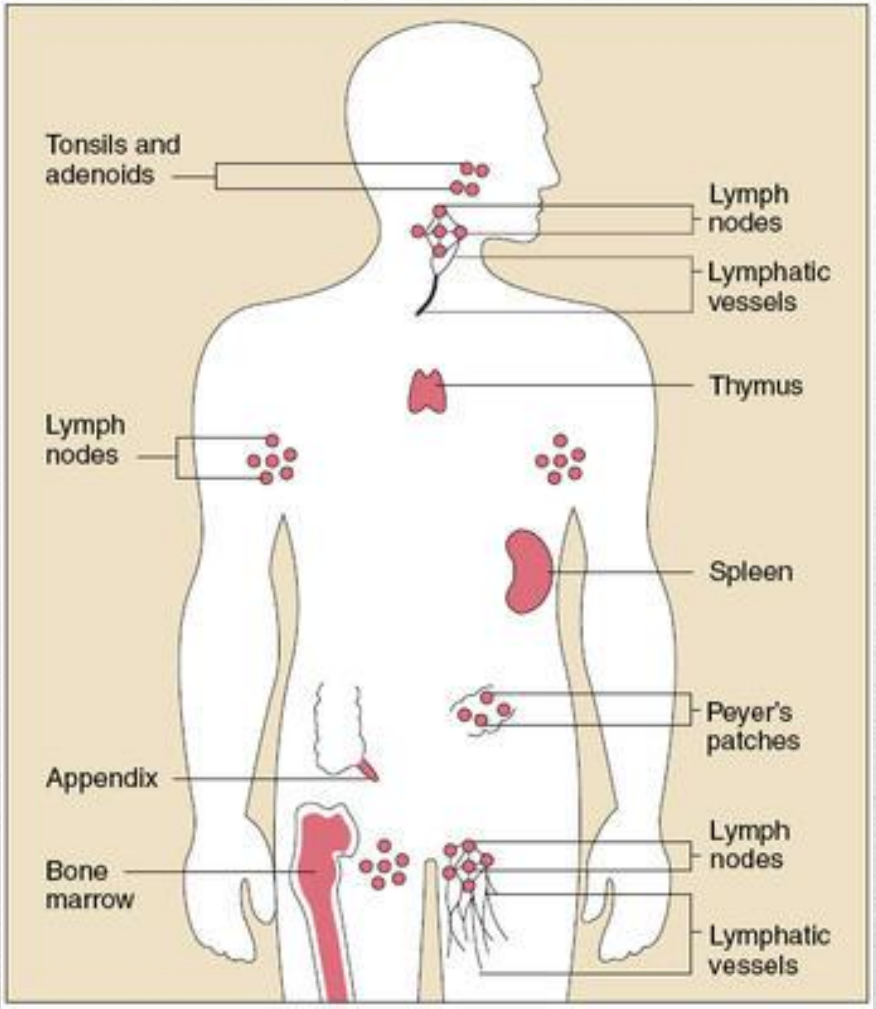
Formed Elements (of Blood)

IN PACKET:

Complete Cardiovascular System questions 53 - 68, Page 74

Lymphatic System

- Primary fxn →**Protection** against disease, foreign particles, toxins, etc., **Excretion** of worn out/damaged cells
- Similar to cardio → system of tubes carrying fluid/**lymph** via body (***to*** heart)
  - Lymph – contains no RBC or platelets
- Primary organs → lymphatic vessels, lymph nodes, spleen, thymus, tonsils
- Nodes located along lymph. vessel rte. – made of lymphoid tissue – make WBC (monocytes, lymphocytes)
- Fxn performed in 2 ways: *stationary cells* (filter harmful material out of lymph as passes to heart OR by *cells traveling* through bloodstream and lymph
- Doctors →Hematologist (hemato – blood) , Immunologist (immuno – immunity/immune system)



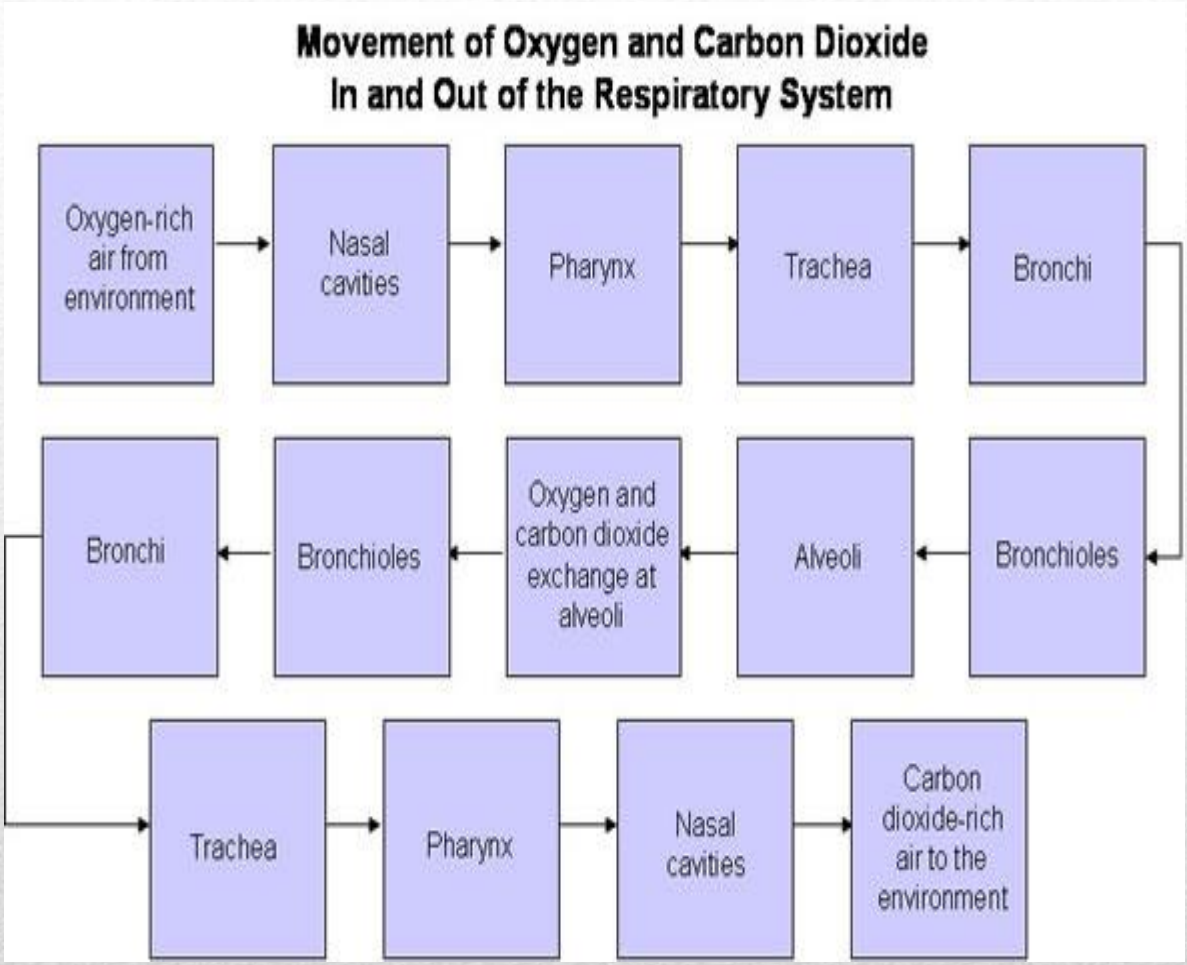
Organs of the Lymphatic System

IN PACKET:

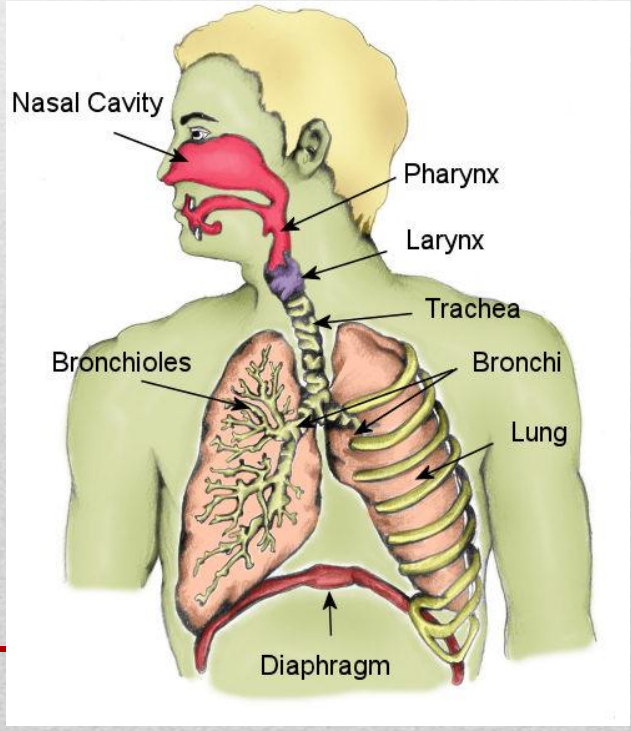
Complete Lymphatic System questions 69 - 76, Page 75

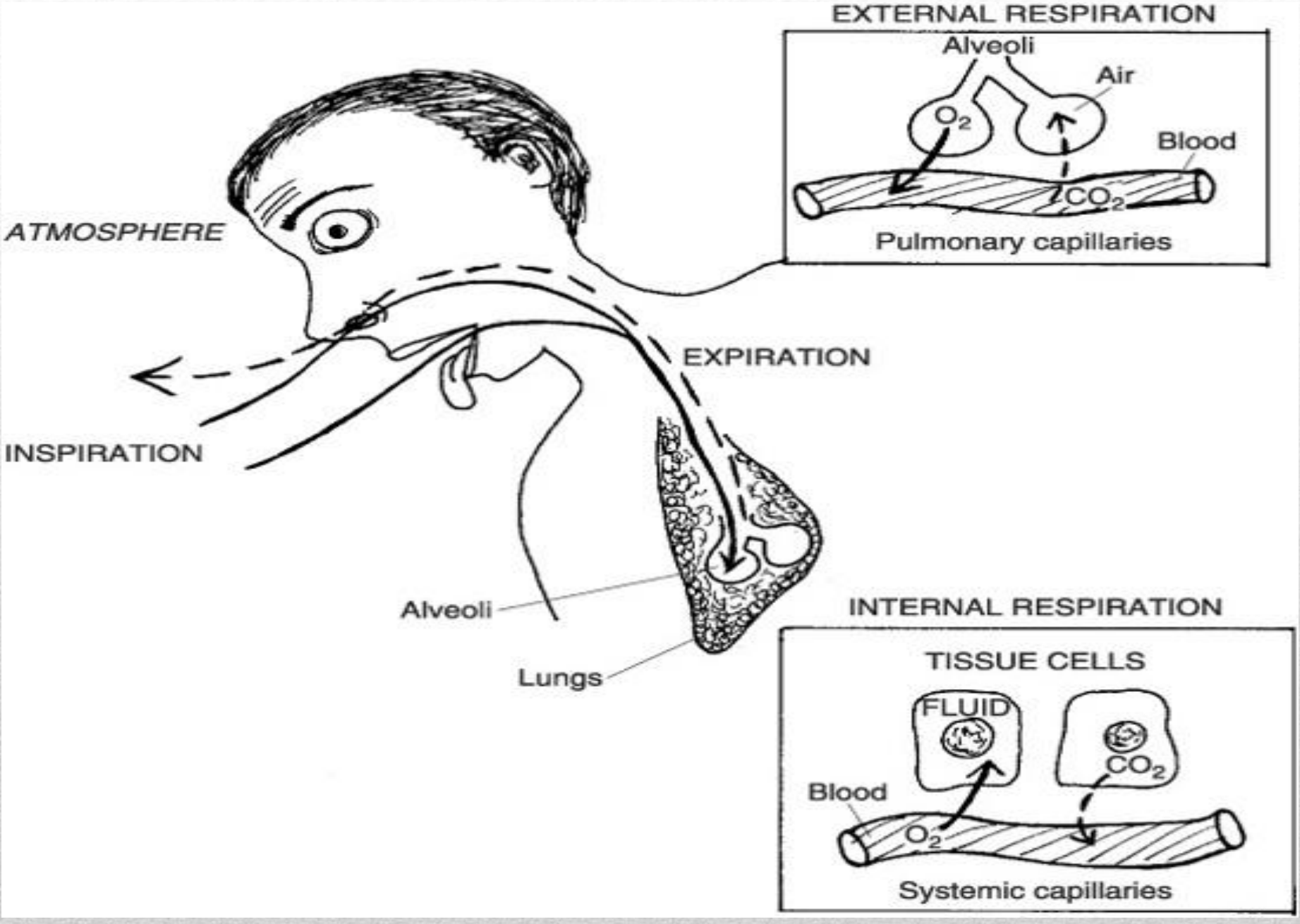
Respiratory System

- Primary fxn →**Regulation** of body temp. by increase/decrease amount of warm, moist air released during ventilation, **Regulation** of pH levels of blood by eliminating excess CO2, **Exchange** of gases between atmosphere and bloodstream (O2 in, CO2 out), **Excretion** of metabolic wastes, such as CO2 and H20
- *2 parts → *conducting zone* & *respiratory zone* (lungs – diffusion occurs btwn air supply and bloodstream)
- **Pathway of organs → nose, throat/pharynx, voicebox/larynx, windpipe/trachea, bronchi, lungs (alveoli & capillaries for gas exchange)**
- Doctors →pulmonologist (pulmonis – lung), otorhinolarynologist (oto – ear, rhis – nose, larunx – larynx, upper part of windpipe --- ENT)



Pathway of Air



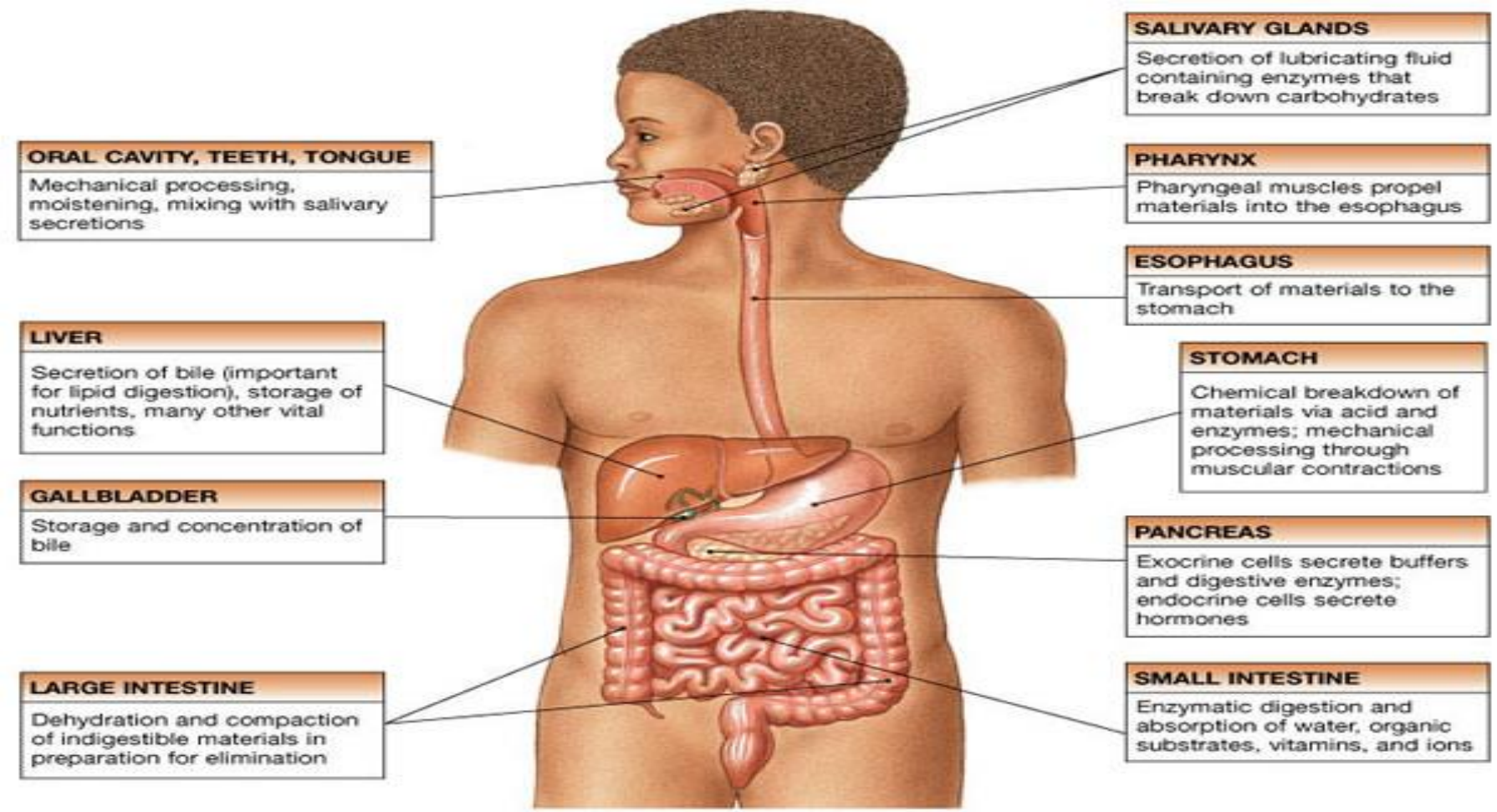

EXTERNAL RESPIRATION
Alveoli
Air
O_2
Blood
CO_2
Pulmonary capillaries
ATMOSPHERE
EXPIRATION
INSPIRATION
Alveoli
Lungs
INTERNAL RESPIRATION
TISSUE CELLS
FLUID
CO_2
Blood
O_2
Systemic capillaries

IN PACKET:

Complete Respiratory System questions 77 – 84, Page 76

Digestive System

- Primary fxn →**Breakdown** of food particles by mechanically and chemically preparing food, **Absorption** of nutrients, ions, etc. from small intestine into the bloodstream, **Excretion** of undigested food from the body
- Pathway of organs → mouth (w/salivary glands) – pharynx – esophagus – stomach *converted into liquid mixture, protein digestion begins – sm. intestine *digestion is completed, *liver and gall bladder provide bile (digestion of fats), *pancreas provides enzymes (digestion of carbs, proteins, fats) *prim. site of nutrient absorb. into bloodstream – lg. intestine *material not absorbed by sm. int. *water removed, returned to bloodstream – anus *solidified waste material eliminated
- Doctors →gastroenterologist (gaster – stomach; entero – inestine), proctologist (procktos – behind/read → dis. of colon, rectum, anus), hepatologist (hepato – liver)



Gastrointestinal Tract

IN PACKET:

Complete Digestive System questions 85 – 96, page 77

Urinary System

- Primary fxn → **Regulation** of water, salt, pH levels in body fluids, **Reabsorption** of needed materials back into bloodstream, **Excretion** of metabolic wastes, toxins, water from body, **Storage** of urine, ***Filtration** of large and small particles by a semi-permeable membrane

- *Transport of urine* → kidney – ureters – urinary bladder – urethra
- Doctors → urologist (UTI), nephrologist (nephro -- kidney)

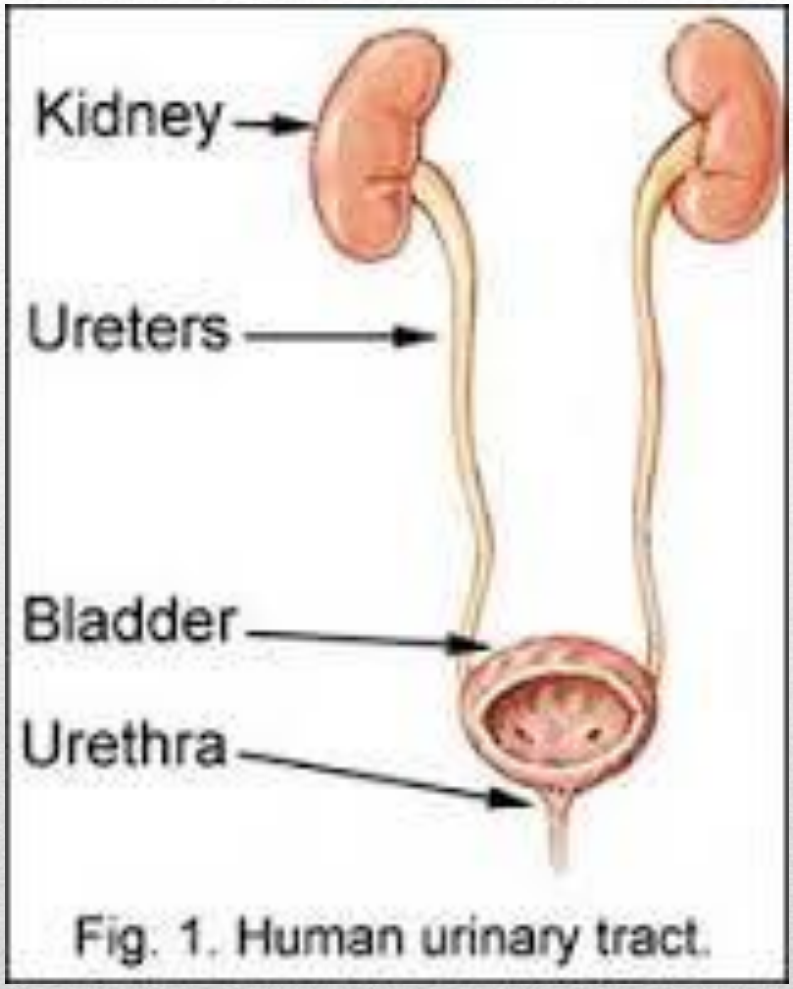


Fig. 1. Human urinary tract.

Urine Pathway

IN PACKET:

Complete Urinary System questions 97 – 102,
Page 78

Reproductive System

- Primary fxn → **procreation** = survival of species
- ***DOES NOT PLAY A ROLE IN HOMEOSTASIS***
- Male & Female – know analogous structures
- M = testosterone ; F = estrogen
- Primary organs →
  - M→ testes – sperm/sex cell production
    - **Travel of sperm: testes -- epididymis – vas deferens – urethra -- penis**
  - F → ovaries – egg/sex cell production ; released @ every 28 days
    → ovum fert. into zygote in fallopian tubes – to uterus
    where embryo develops/location of menstruation
- Doctors → gynecologist (women -- F genital tract/uterus, vag, ovary), obstetrician, urologist (urinary tract, male repro. – prostate cancer,), fertility specialist