

Doc John's Class on Tuesday November 20, 2007

Levels of Organization-An Overview (Test on (Page 2-3) in Blue book): The body is made up of millions of individual units called cells. Cells are the smallest living part of the body.....

Chemical -

Cellular – Cells are the smallest living part of the body.

Tissue – A collection of cells having the same function.

Organ – Different tissues that are grouped together and perform the same function.

Systemic – Organs that perform certain functions are grouped together as systems

Organism -

The Holistic Approach: - What happens to one tissue effects the whole body and what happens to the body affects all of its parts.

Effects: The result produced by an action

Affects: A Freudian term for the feeling of pleasantness or unpleasantness evoked by a stimulus.

It is the holistic concept that alternative/complementary therapy, of which massage is one, adopts. To extend this further, the manipulation of the soft tissue in one are potentially affects the whole body.

Homeostasis:

Traditionally, the body has been divided into many systems, according to specific functions.

The ultimate purpose of every system, however, is to maintain a constant cell environment, enabling each cell to live.

Extracellular Fluid: the name given to the fluid outside of the cell.

Intracellular Fluid: the name given to the fluid inside of the cell.

Note: the Extracellular fluid inside the blood vessel is known as the Intravascular Fluid, or Plasma.

Note: the fluid outside of the cells and the blood vessel is known as

Note: because interstitial fluid surrounds the cells, it is known as the Internal Environment.

The condition of constancy in the internal environment is called Homeostasis.

Each system continuously alters its active state to maintain homeostasis.

Feedback System: Need this

Negative Feedback: Need This

Systems of the Body (Know these! Pages 5-9 of Blue Book)

1. **Integumentary** (Skin) includes the skin and all of its structures, such as sweat glands, nails and hair
2. **Skeletal** (Bones)
3. **Muscular**
4. **Nervous**
5. **Endocrine (hormones)**
6. **Cardiovascular (aka circulatory)**
7. **Lymphatic**
8. **Respiratory**
9. **Digestive**
10. **Urinary**
11. **Reproductive**

Characteristics of a living Organism (Be familiar with)

- A. Movement
 - B. Responsiveness
 - C. Growth
 - D. Reproduction
 - E. Respiration
 - F. Digestion
 - G. Absorption
 - H. Circulation
 - I. Assimilation
 - J. Excretion
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Systems of the Body Expanded

1. **Integumentary (Skin):**
 - a. **Includes** the skin and all of its structures, such as sweat glands, nails and hair
 - b. **Major Function:** to protect the body from environmental hazards and to maintain core temperature.
 - i. The skin possesses sensors (nerve receptors) that detect temperature change.
 - ii. Rise in temperature detected, network of blood vessels in the skin, aided by the nervous system, dilate and more blood reaches, closer.....
 - iii. Missed this one.....
 - c. **Other Skin Functions** include manufacturing vitamin D and eliminating waste products
2. **Skeletal** (Bones)
 - a. Comprises the bones, bone marrow and joints of the body.
 - b. **Major Function** - Support the body:
 - i. Provide an area for muscle attachment (bones)
 - ii. Allow movement in various planes)joints)

- iii. Protects tissues and Organs, IE Ribs, Pelvic
- iv. Different parts of the bones manufacture blood cells.

3. Muscular System:

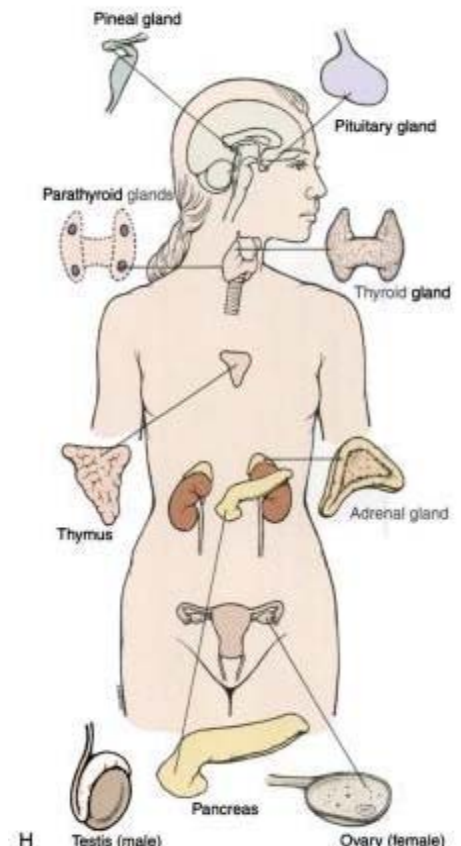
- a. Includes all tge muscle tissue of the body. Responsible for any type of movement.
- b. Includes origins, insertions and actions of the muscles
- c. Muscle Tissue:
 - i. Cardiac
 - ii. Skeletal
 - iii. Smooth Muscle
- d. This system allows the organism to move in the external environment
 - i. Internal muscles help move blood inside the body (heart)
 - ii. The blood volume can be altered by muscle contraction.
 - iii. Muscle contraction produces heat and helps maintain body temperature.

4. Nervous System

- a. Consists of structures that respond to stimuli from inside and outside of the body, integrating the sensed stimuli and producing an appropriate response.
- b. Includes
 - i. Brain
 - ii. Spinal cord
 - iii. Nerves
 - iv. Supporting Tissue
 - v. Note: this system coordinates the activities of all other organ systems.
- c. CNS -
- d. PNS -

5. Endocrine (hormones) (Diagram H on page 10 will be on test)

- a. Works closely with the nervous system. Through the use of hormones it produces long term changes in various organs and.....
- b. Includes
 - i. Pituitary
 - ii. Thyroid
 - iii. Parathyroid
 - iv. Adrenal glands
 - v. Endocrine part of the
 - 1. Pancreas
 - 2. Ovary
 - 3. Testis
- c. Hormones are the chemicals secreted by the organs of the endocrine system.



6. Cardiovascular (aka circulatory)

- a. Responsibility: Circulation of Blood
- b. Includes
 - i. Heart
 - ii. Blood Vessels
 - iii. Blood

- c. Transports oxygen nutrients and hormones throughout the body to various tissues, according to the needs of the tissue

7. Lymphatic

a. Includes

- i. Lymph Vessels
- ii. Lymph Nodes
- iii. Lymphoid Tissue
 - 1. Tonsils
 - 2. Spleen
 - 3. Thymus

- b. Responsible for defense against infection and disease and to help remove excess water from the tissue spaces

8. Respiratory System

- a. Brings oxygen to the site where exchange can take place (between air and blood). Also brings carbon dioxide, a byproduct of metabolism, to be released in the air.

b. Includes

- i. Nose
- ii. Nasal Cavity
- iii. Pharynx
- iv. Larynx
- v. Traches
- vi. Bronchial Tubes
- vii. Lungs

9. Digestive Test Question= One long tube

- a. Responsible for breaking down the food eaten, into a form that can utilized by the body.

b. Includes

- i. Mouth (lips, teeth, soft and hard palette...)
- ii. Pharynx
- iii. Esophagus
- iv. Stomach
- v. Small intestine
- vi. Large intestine

10. Urinary

- a. Function – Eliminates excess water, salts and waste products.
- b. Helps conserve water and salt if dehydrated
- c. Helps maintain the body fluid PH along with the respiratory system.

d. Includes

- i. Kidney
- ii. Ureter
- iii. Urinary Bladder
- iv. Urethra

11. Reproductive – Propagation of species

a. Includes

- i. Ovary -Fallopian tubes in women

ii. Testis -

Planes of Reference

3 planes

- a. **Sagittal Plane**: Divide body front to back into Left and Right parts.
- b. **Frontal plane (Coronal)**: runs from Left to Right, dividing the body into front and back portions.
- c. **Transverse or Horizontal Plane**; runs across (Missed This).....

Directional References

- a. **Superior/cranial or Cephalic**: toward the head.
- b. **Inferior or Caudal**: toward the bottom or away from the head.
- c. **Anterior or Ventral**: a structure lying in front of another.
- d. **Posterior or Dorsal**: a structure lying behind another
- e. **Medial**: structures lying closer to an imaginary line passing through the middle of the body in the Sagittal plane
- f. **Lateral**: Away from the middle
- g. **Deep or Internal**: structure lying away from the surface of the body
- h. **Superior or External**: Structures close to the surface
- i. **Proximal**: Structures closer to the surface
- j. **Distal**: Structures away from the trunk.

Body Regions (Pages 12-13 of Blue Book)

Major Body Regions

- a. Head
- b. Neck
- c. Trunk
- d. Upper extremity
- e. Lower extremity

Head and Neck

- a. **Head**
 - a. Facial region
 - i. Eyes
 - ii. Nose
 - iii. Mouth
 - b. Cranial Region
 - i. Top of head
 - ii. Back of head
 - c. Neck (cervical region)
 - d. Frontal forehead region
 - e. Orbital (eye)
 - f. Otic (ear)
 - g. Buccal (cheek)
 - h. Nasal (nose)
 - i. Oral (mouth)
 - j. Mental (chin)

Trunk: (refers to the combination of the chest and abdomen)

1. **Chest, Thorax or Thoracic Region:**
 - a. Mammary area (region around the nipples)
 - b. Sternal Region (region between the mammary area)
 - c. Axillary region (arm pit area)
 - d. Vertebral region (posteriorly)
 - e. Scapular region (Shoulder blade)

2. **Abdomen Region:** Region below the chest
 - a. Umbilicus (belly button, naval)
 - b. Pelvic Region (lower most part)
 - i. Pubic
 - ii. Perineum (contains external genitalia and anus)
 - c. Lumbar Region (lower back area)
 - d. Buttock or Gluteal region (large hip area)
 - e. Sacral (lower most central region of the back)

3. **Upper Extremity:**
 - a. Deltoid, Acromial or Shoulder Region
 - b. Brachium or upper arm
 - c. Antebrachium or forearm
 - d. Manus or hand regions

Between the upper arm forearm

- a. Elbow or Cubital region
- b. Cubital fossa (front of the elbow) Anticubital
- c. Olecranal region (back of the elbow)
- d. Carpal region (wrist area)
- e. Palm (front of the hand)
- f. Dorsum (back of the hand)
- g. Digital or Phalangeal region (fingers)

Lower Extremity:

1. **Thigh or Femoral**
2. **Knee**
 - a. Patellar region front of knee
 - b. Popliteal Fossa (back of knee)
3. **Leg (know Crural and Sural)**
 - a. Crural Region (anterior part of leg)
 - b. Shin (bony ridge felt in the anterior part of the lower leg)
 - c. Calf or Sural region (post myo of the lower leg)
4. **Foot**
 - a. Ankle (joint between leg and foot)
 - b. Tarsal (tarsal bones, ankle bones)
 - c. Heel or Calcaneal (Posterior part of the foot)
 - d. Sole/Planter Surface (part of the foot that faces the ground)
 - e. Dorsum (superior surface of the foot)
 - f. Digits (digits and toes)

The Abdomen is often divided into 4 regions or quadrants

1. Right Upper (Quadrant)
2. Left Upper (Quadrant)
3. Right Lower (Quadrant)
4. Left Lower (Quadrant)

At times the Abdomen is divided into 9 regions

1. Right Hypochondriac
2. Right Lateral/Lumbar
3. Right Inguinal/Iliac
4. Epigastric
5. Umbilical
6. Hypogastric
7. Left Hypochondriac
8. Left Lateral
9. Left Inguinal/Iliac Regions

Hypochondriac: A person who has hypochondriasis, a disorder characterized by a preoccupation with body functions and the interpretation of normal body sensations (such as sweating) or minor abnormalities (such as minor aches and pains) as portending problems of major medical moment. Reassurance by physicians and others only serves to increase the hypochondriac's persistent anxiety about their health.

But what is the anatomical (region) definition?

Diagram on Page 15 on Test

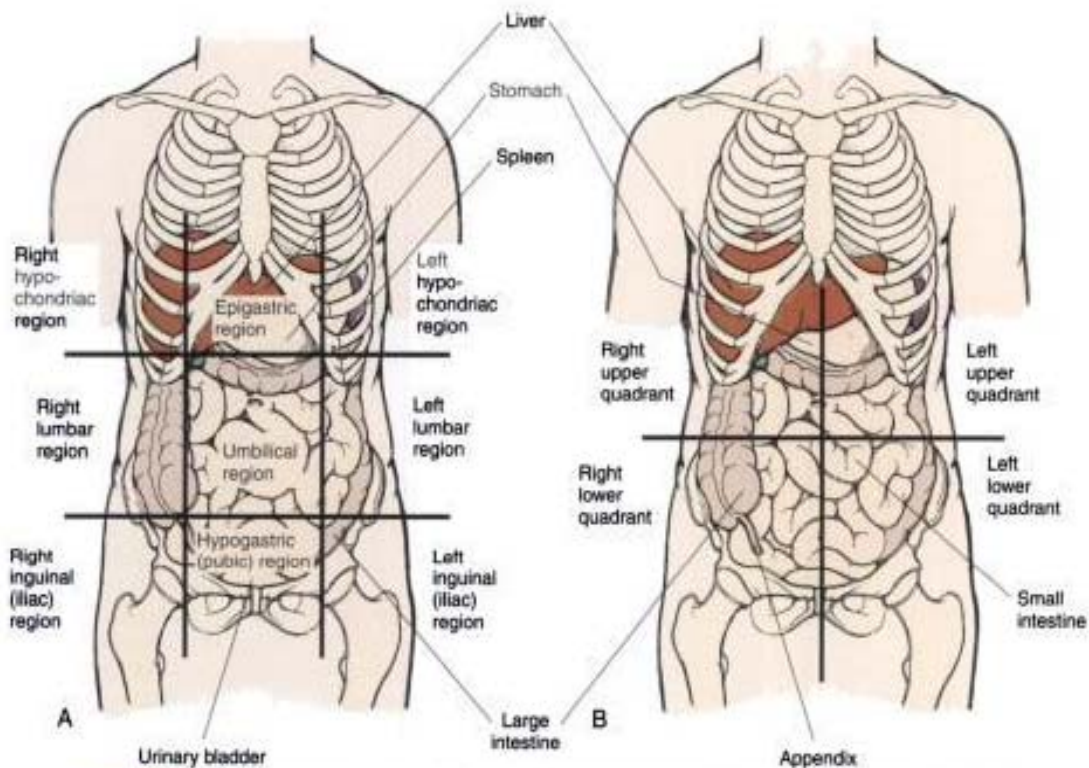


FIGURE 1.8. Abdominal Regions. A, Anterior view showing nine abdominopelvic regions; B, Anterior view showing abdominopelvic quadrants.

Body Cavity (Test for sure)

- a. Cranial and Vertebral, or Spinal Cavities
- b. Thoracic Cavity
 - a. Pleural Cavity (lungs lie inside)
 - b. Pericardial Cavity (heart lies)
- c. Abdominopelvic Cavity
 - a. Abdominal Cavity
 - b. Missed This

The Body is made up of chemical bonds

Chemical reactions

There is a constant reaction in the human body between atoms and molecules. Cells control these reactions to stay alive.

Energy: the capacity to work

Work: movement or a change in the physical structure of matter.

Enzymes: The various chemical reactions in the body would proceed too slowly to be of any use if they did not have mechanisms in place to speed up the reaction. Enzymes are on the mechanisms that help that process.

Important Organic Compounds of the Body:

1. Carbohydrates
2. Proteins
3. Fats or Lipids
4. Nucleic Acids

85% of our brains are made of cholesterol

Carbohydrates (Page 22 of Blue Book)

Carbohydrates are organic compounds that have carbon, hydrogen and oxygen in a ration of 1:2:1 Sugars and starches are typical examples.

Carbohydrates account for 2-3% of body weight, lipids 10-12% and proteins about 20%.

Lipids

Lipids are organic compounds that have carbon, hydro

Lipids are used to form important structures such as cell membranes and certain hormones. This makes them an important part of energy.

Proteins (Page 23 of Blue Book)

100,000 different kinds of proteins in the body. The bulk of our muscles are made out of proteins. Proteins consist of organic molecules chains known as amino acids.

Nucleic Acids:

Large organic molecules containing carbon, hydrogen, oxygen, nitrogen and phosphorous. There are 2 types of nucleic acid.

DNA (Deoxyribnoclueic) DNA is in the form of a double helix. A small segment of DNA molecule forms a gene.

RNA () RNA conveys the message frm the gene to the cell and determines the amino acids sequence when proteins are synthesized

Cytoplasm

The material enclosed by the cell membrane is known as cytoplasm

Organelles

Mitochondria – The Mitochondria are double membrane structures

95% of the ATP requirements are provided by mitochondrial activity.

Endoplasmic Reticulum

Golgi Apparatus

Lysosomes

Cell Picture

Peroxisomes

Cytoskeleton

Microvilli

Cilia

Flagella

Blue Book (page 26 and 27)

Ribosomes

Nucleus

Protein Synthesis