Introduction to the Human Body

Anatomy & Physiology – what is it??

Anatomy – deals with the structures of body parts & their relationships with one another

In Greek language, ‘anatomy’ literally means to cut apart

Physiology – deals with the functions of those structures, and how they work

So…”human anatomy & physiology” literally means, ‘the structures of the human body and how they work”

<u>Divisions of Anatomy:</u>

Gross (macroscopic) anatomy

· “gross” means a high quantity

· Study of large body structures visible to the naked eye

· Examples: lungs, liver, heart, bones, etc

Gross anatomy can be broken down into these subdivisions:

Regional anatomy:

· All the structures in one particular region are studied

Examples (room to write here):

Systemic anatomy:

· The gross anatomy of the body is studied system by system

Examples (room to write here):

Surface anatomy:

· Study of internal body structures as they relate to the overlying skin surface

Examples (room to write here):

Microscopic anatomy

· Deals with structures too small to be seen without the aid of a microscope

Microscopic anatomy can be broken down into these subdivisions:

Cytology:

Histology:

Developmental anatomy

· Study of structural changes in an individual from conception through old age

· One subdivision of developmental anatomy is *embryology*; this is the study of developmental changes before birth.

<u>Divisions of Physiology:</u>

The most common subdivisions include:

· *Renal physiology*

- *Neurophysiology*
- *Cardiovascular physiology*

Study format: remember this trick…..

Complimentarity of structure & function:

- What a structure can do depends on its specific form

Examples:

<u>Levels of structural organization:</u>

Chemical level

Cellular level

Tissue level

Organ level

Organ system

Organism

Examples of body systems:

<u>Maintaining life</u>

What does our highly organized body do? How does it support life? *Look at these necessary life functions*:

All living things must:

- Maintain boundaries
- Move
- Be responsive
- Digest nutrients
- Have metabolism

- Excrete wastes
- Reproduce
- Grow

Survival needs:

These are different than necessary functions; rather than being a task, these are the requirements of items our body must have to survive. They include:

- Nutrients
- Oxygen
- Water
- Atmospheric pressure

Homeostatic control mechanisms:

- Your body must stay in balance
- Homeostasis is when the body's internal conditions

are kept fairly constant, while external conditions are always changing

- If the environment changes, your body must change accordingly to keep itself in balance.

How the system works:

A factor or event being regulated is called a “variable”

Basically, there are receptors, a control center, and effectors

Receptors take in certain stimuli (what is a stimulus? You could be tested on this!!)

The system in order:

- Affector cells
- Afferent pathway
- Control center
- Efferent pathway
- Effector cell

Room to draw pathway & examples here:

Negative vs. positive feedback

Negative feedback:

· Causes a body change in the opposite direction of the stimulus

Examples:

Positive feedback:

· Causes a body change in the same direction as the stimulus

Examples:

**Which one of these is more common??

The Language of Anatomy

The anatomical language is designed to be more accurate & *less* confusing (although most students disagree … why??)

Anatomical position:

<u>Directional Terms & Orientation:</u>

Superior (cranial) – toward the head or upper part of body; above

Inferior (caudal) – away from the head or toward the lower part of a structure

Anterior (ventral) – toward the front or in front of

Posterior (dorsal) – toward or at the back of the body

Medial – toward the body's midline

Lateral – away from the midline of the body

Intermediate – between a more medial & a more lateral structure

Proximal – closer to the origin of a body part

Distal – farther from the origin of a body part

Superficial – shallow; toward the body surface

Deep – more internal; away from the body surface

<u>Body Planes:</u>

Frontal plane:

Separates body into anterior & posterior sections

Sagittal plane:

Separates body into left/right sections

Transverse plane:

Separates body into superior & inferior sections

What's another name for a transverse plane?

<u>Body cavities:</u>

Dorsal body cavity:

Subdivided into cranial cavity & spinal cavity

Ventral body cavity:

· Subdivided into thoracic & abdominopelvic cavity

· Abdominopelvic cavity divided into the abdominal cavity & the pelvic cavity

Abdominal cavity: Includes most of the body's vital organs
Pelvic cavity: Includes urinary bladder, ovaries in females

REVIEW OUTLINES FOR A & P DIVISIONS, AND BODY CAVITIES:

I. Anatomy Divisions
   A. Macroscopic anatomy
      1. regional anatomy
      2. systemic anatomy
      3. surface anatomy

   B. Microscopic anatomy
      1. cytology
      2. histology

   C. Developmental anatomy
      1. embryology

II. Physiology Divisions
   A. renal physiology
   B. neurophysiology
   C. cardiovascular physiology

I. Dorsal Body Cavity
   A. cranial cavity
   B. spinal cavity

II. Ventral Body Cavity
   A. thoracic cavity
      1. pleural cavities, pericardial cavity

   B. abdominopelvic cavity

1. abdominal cavity
2. pelvic cavity