

The image features two large, thick black L-shaped brackets. One is positioned in the top-left corner, and the other is in the bottom-right corner. They are oriented towards each other, framing the central text.

INTRODUCTION TO ANATOMY & PHYSIOLOGY

Introduction

- Anatomy

- *Deals with the structures (morphology) of body parts*

- Physiology

- *Deals with the functions of body parts.*
- *What they do and how they do it.*

Structure and Function

- Difficult to separate the two (anatomy & physiology) because they are so closely related to each other.
- Often times the structure of an object determines its function as well.
 - *Nature tweaks the structure so it can do what it needs to do in the most effective way possible.*
 - *Human hand*
 - Long jointed fingers make it easy to grasp objects

Group Work – Levels of Organization

1

Take out the various pictures you have at your table. Do not use the words yet.

2

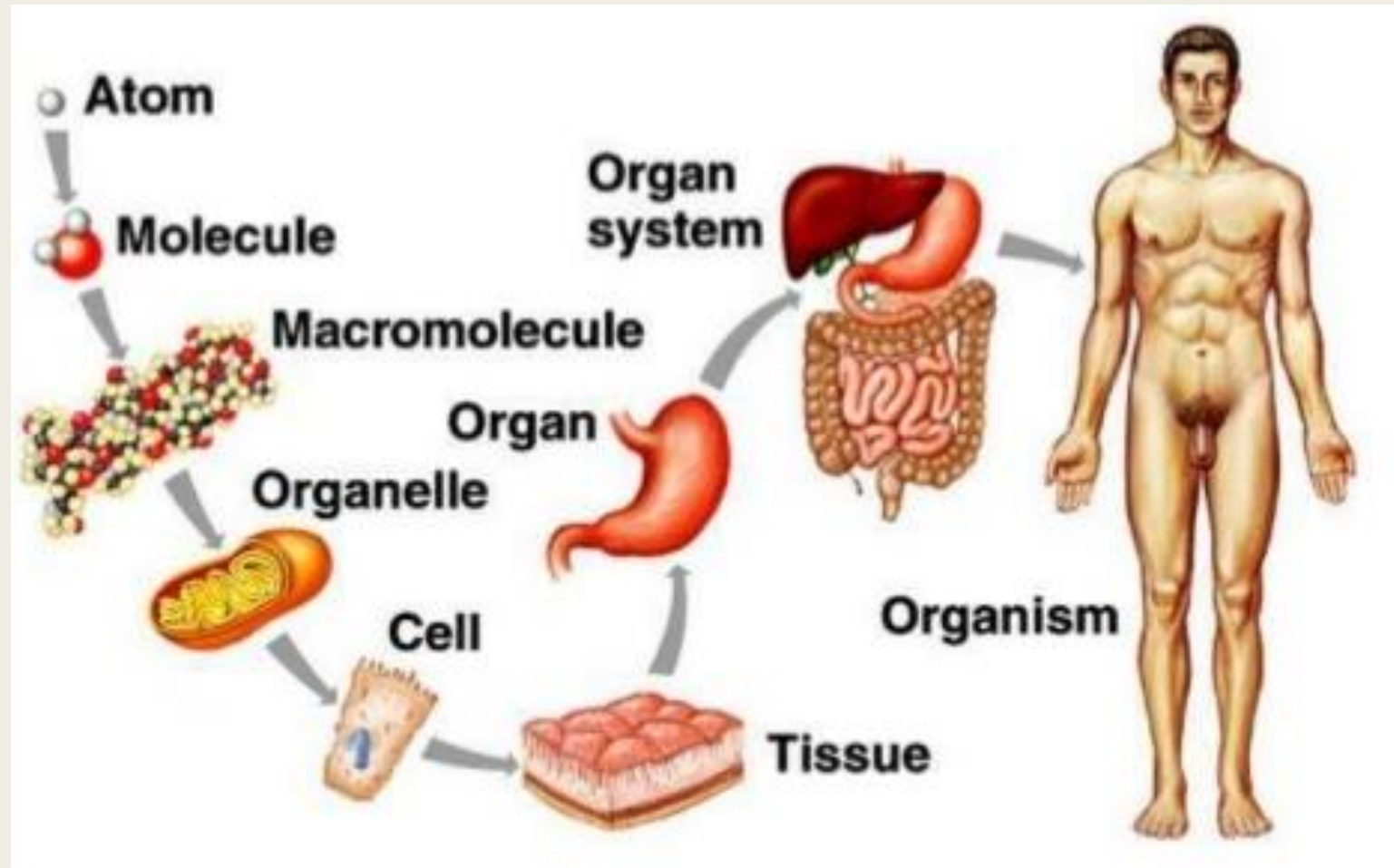
Arrange the pictures from the least to the most complex.

3

Now look at the words and assign each level a name.

Levels of Organization

Smallest



Largest

Chemical Level

- Atoms
 - *Smallest form of matter*
- Molecules
 - *Atoms join together to form molecules*
- Macromolecules
 - *Small molecules combine in complex ways to form larger macromolecules (proteins, carbohydrates, lipids, nucleic acids)*

Cellular Level

- Organelles

- *Structures found within cells that are made up of many macromolecules and carry out specific activities*

- Cells

- *The basic unit of structure and function in organisms.*
- *Vary in size, shape, and specialized functions but also share certain characteristics.*

Increasing Complexity

- Tissue

- *Cells are organized into layers or structures that have common functions.*

- Organs

- *Groups of tissues that interact forming complex structures with specialized functions.*

Most Complex Level

- Organ System

- *Groups of organs that function closely together*

- Organism

- *Organ systems that work together and make up a living thing*

Group Work – Characteristics of Life

- Brainstorm with your group how scientists might determine if something is “alive”.
- What types of things must a living object do that is different from a non-living object?
- Maybe use this sentence and fill in the blank to help you brainstorm: “If this object _____, then it is alive.”
 - *Must apply to ALL living things (plants, bacteria, etc.)*

Characteristics of Life

All living things do/have the following:

- Move
- Respond
- Grow
- Reproduce
- Made up of cells
- Metabolize
- Maintain homeostasis

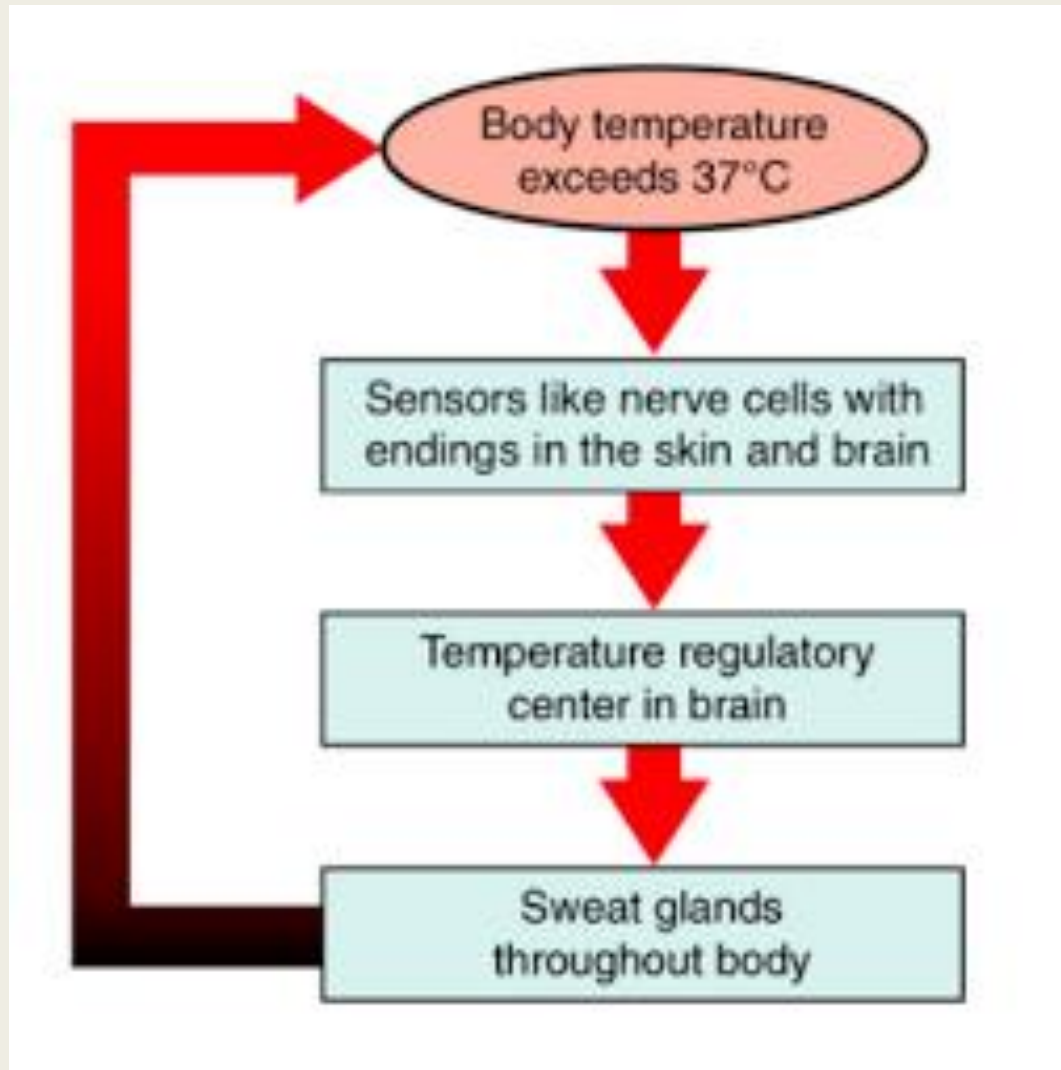
Metabolism

- All of the chemical reactions in cells
 - *Eating (Ingesting)*
 - *Breaking down food (Digestion)*
 - *Absorbing and using the nutrients*
 - *Using the energy from food (Cellular Respiration)*
 - *Removing wastes*

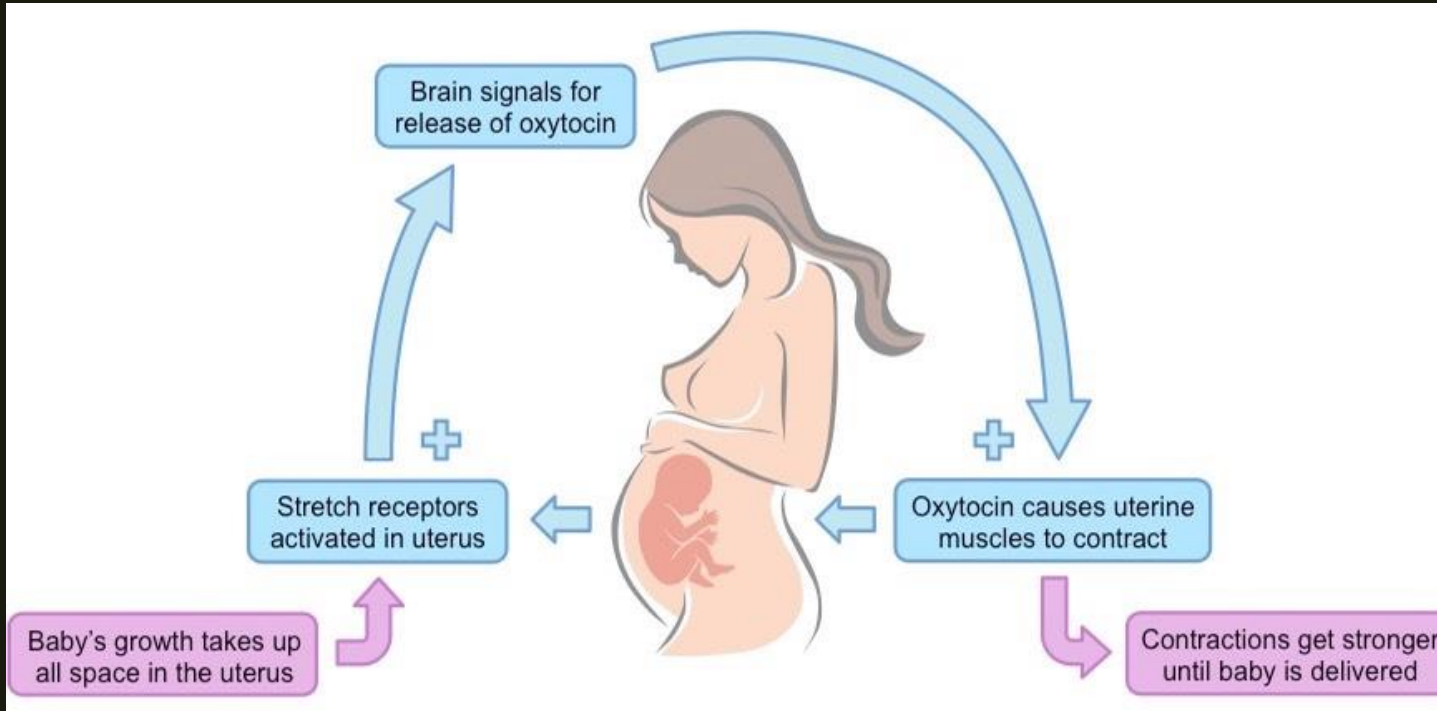
Homeostasis

- How an organism responds to changes in the external environment in order to survive.
- Self-regulating control systems
 - *Negative feedback loop*
 - *Positive feedback loop*

Negative Feedback Loop

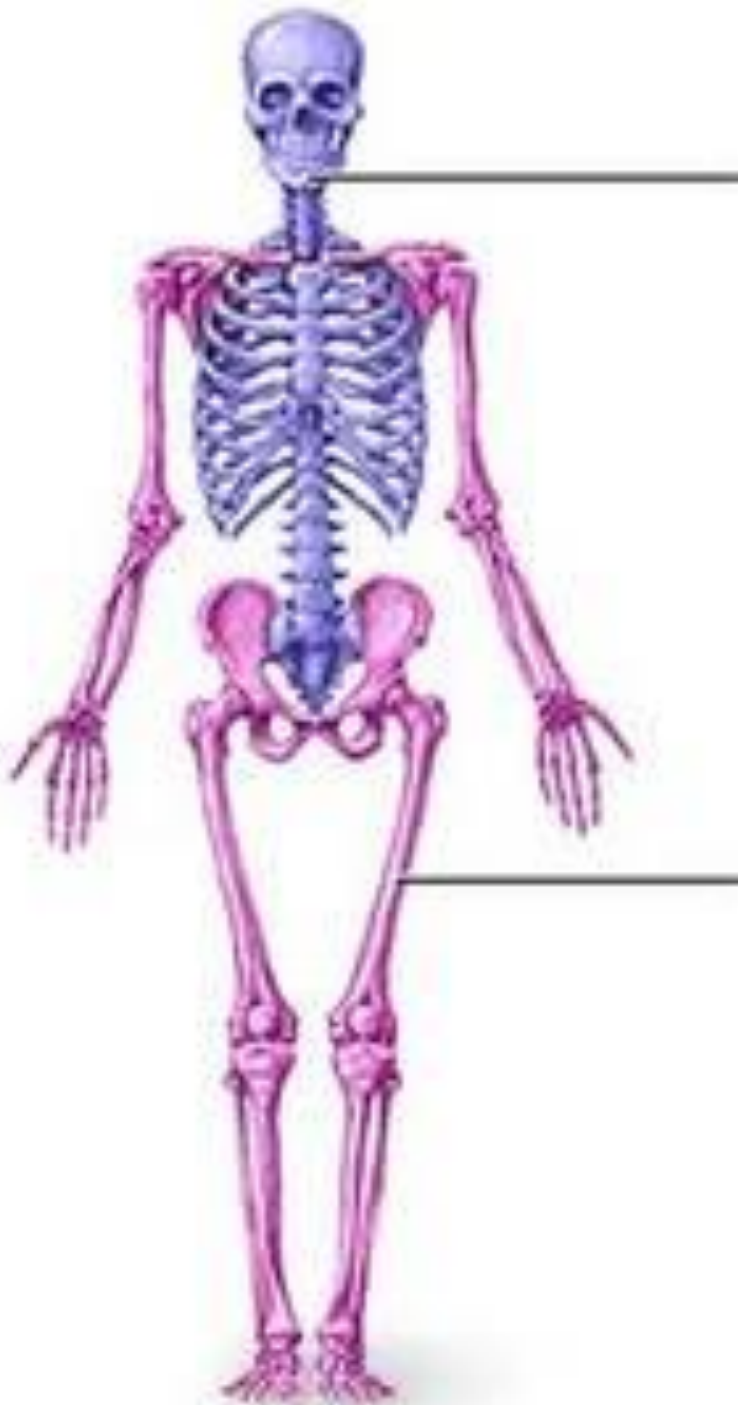


- Receptors measure changes in the body's setpoint.
- Effectors are activated to return conditions toward normal.
- As conditions return to normal and the changes in the setpoints lessen, effectors are shut down.



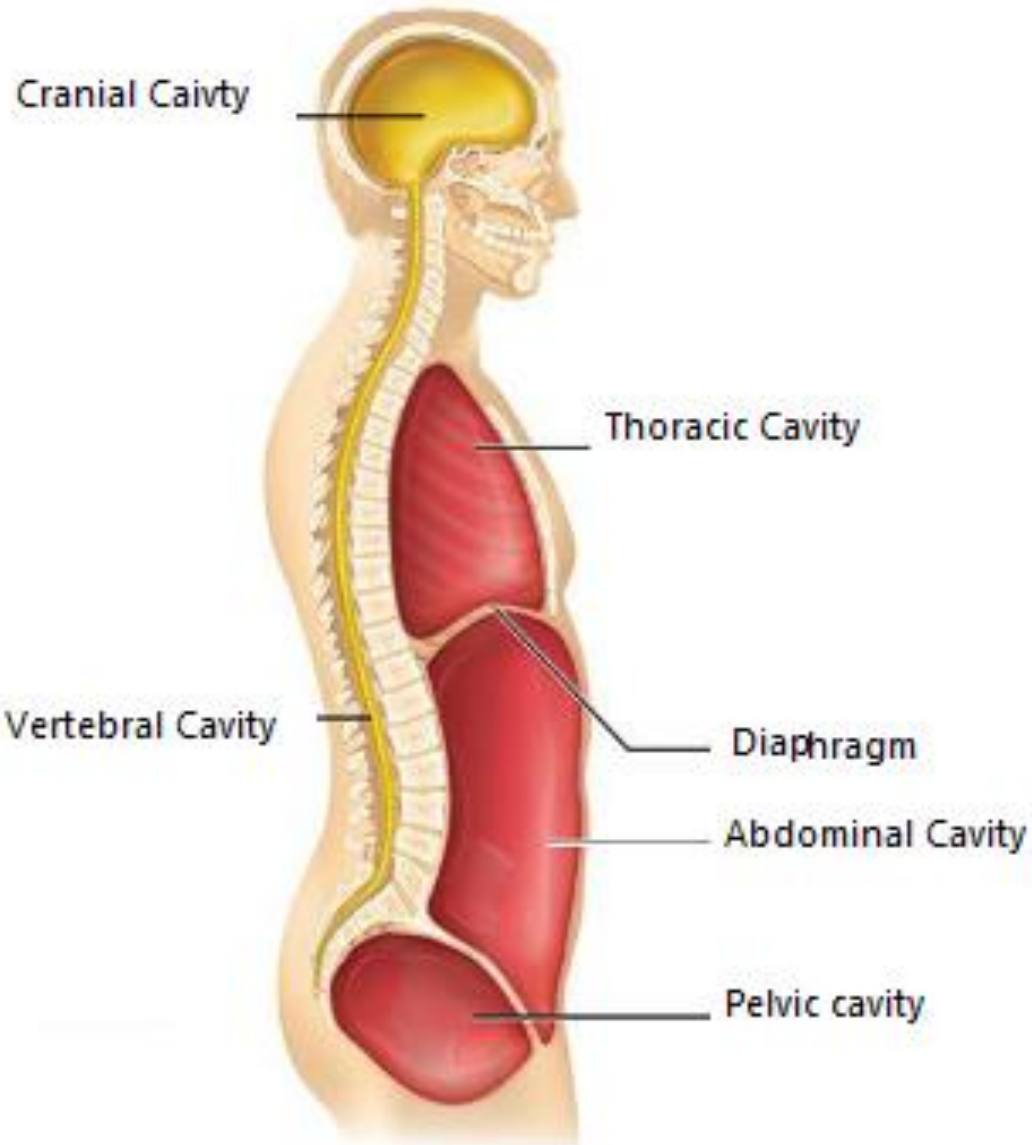
Positive Feedback Loop

- Receptors measure changes in the body's setpoint.
- Effectors are activated to continue to move conditions away from the setpoint.



Organization of the Human Body

- Human body can be divided into two portions:
 - *Axial (BLUE): consists of the head, neck, and trunk*
 - *Appendicular (PINK): includes upper and lower limbs*

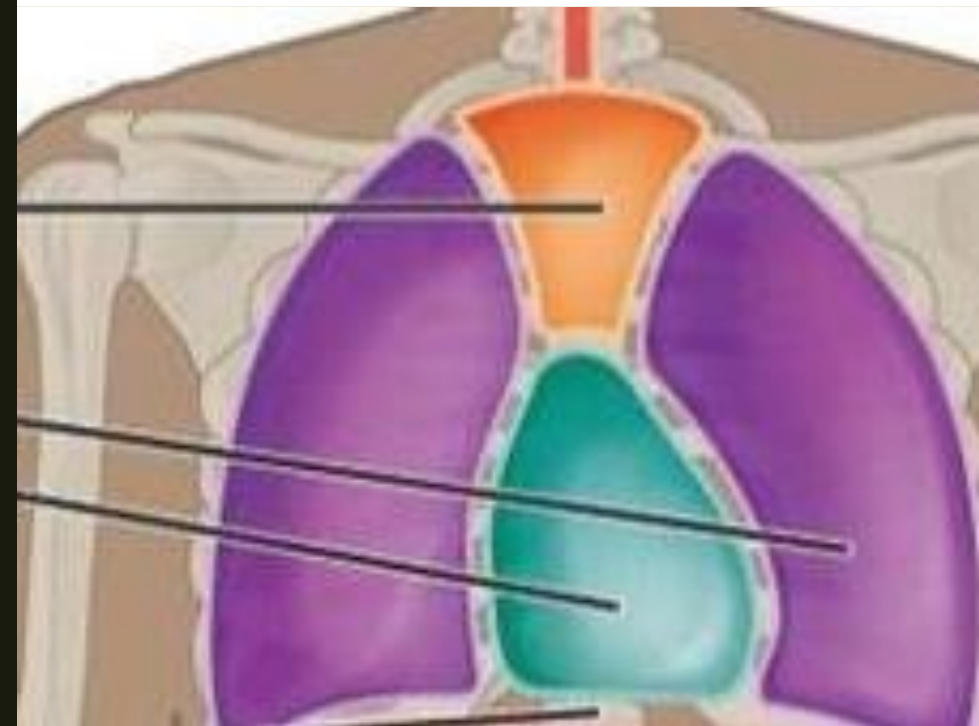
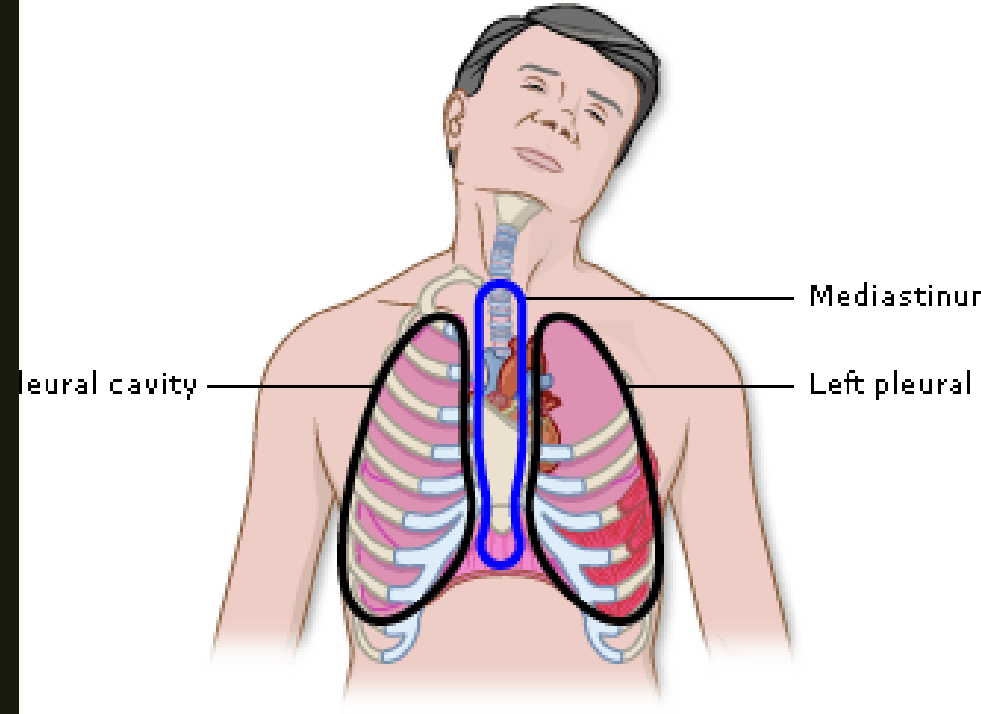


Axial Portion

- Cranial
- Vertebral
- Thoracic
 - (Diaphragm separates)
- Abdominopelvic (which is further divided into)
 - *Abdominal*
 - *Pelvic*

Thoracic Cavity

- Further divided into two regions
 - *Mediastinum*
 - Includes the pericardium
 - *Pleural (right & left)*



Body Cavity Labeling

- Spend a few minutes working in a group to correctly label the body cavity diagram in your notes.
- Color each cavity a different color and make sure to include a key to help you study!

Organ Systems

A central diagram of a human figure is surrounded by eleven smaller human figures, each illustrating a different organ system. Lines radiate from the central figure to each of the surrounding figures. The systems shown are: Reproductive system, Integumentary system, Skeletal system, Muscular system, Nervous system, Digestive system, and Respiratory system. The labels for these systems are placed near their respective figures.

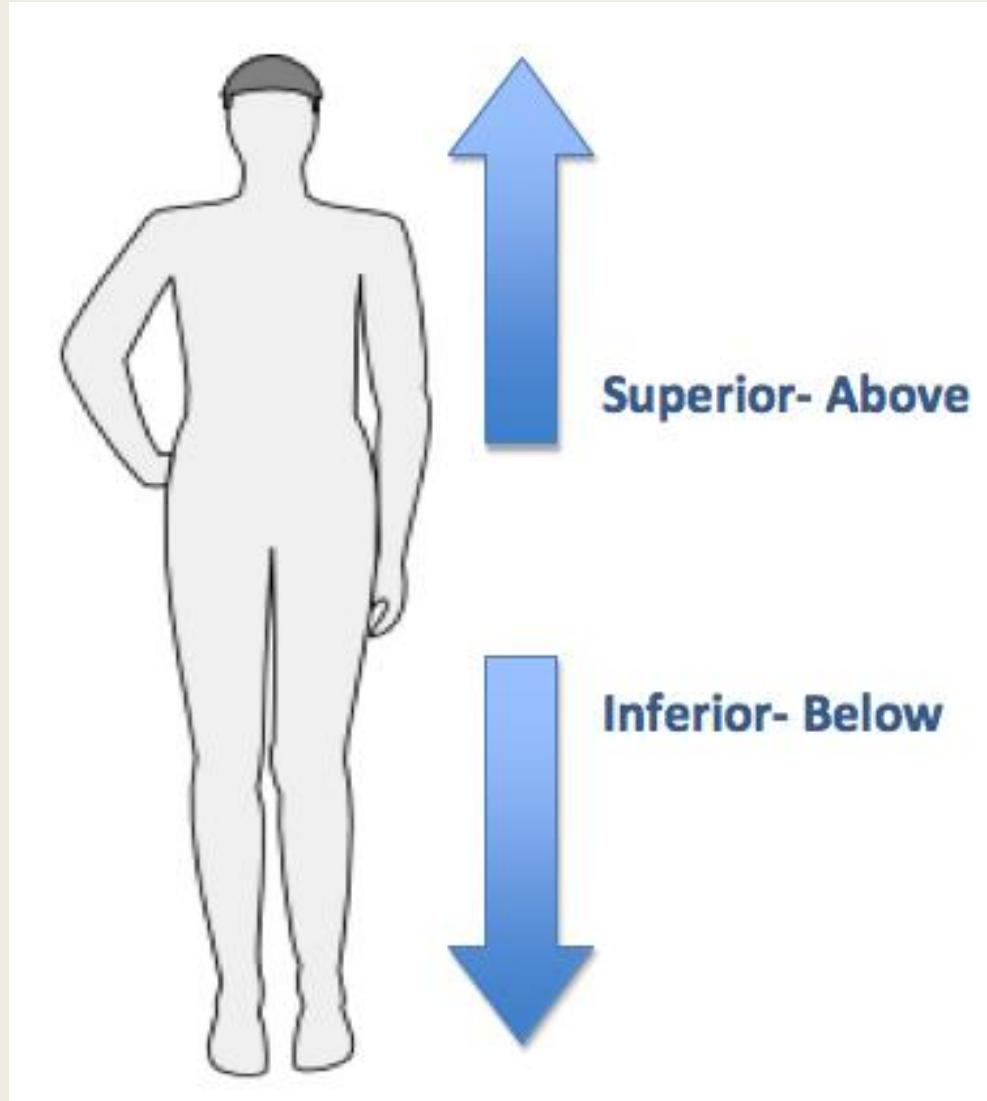
- Eleven organ systems in the human body.
- Each system has a set of interrelated organs that work together to provide specialized functions that contribute to homeostasis.

Individual Work – Fill in the table in your notes.

Name	Name the 11 organ systems.
List	List the major organs of the system.
Describe	Describe the general function of the system.

Anatomical Terminology

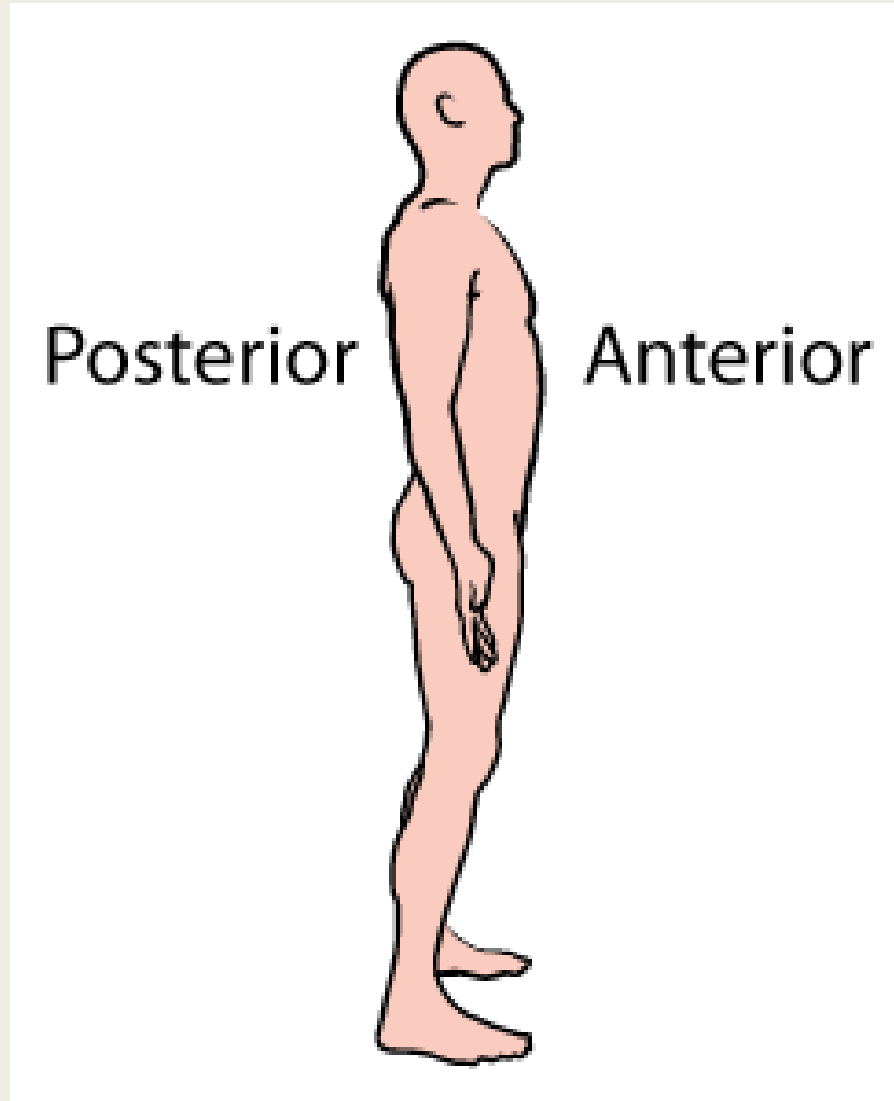
- To communicate effectively with one another, medical personnel have developed a precise vocabulary to describe anatomy and relative position of body parts.
- Makes one assumption: The body is in anatomical position.
 - *Standing erect*
 - *Face forward*
 - *Upper limbs at the sides*
 - *Palms facing forward*



Anatomical Positions

- Superior: body part is above another part
- Inferior: body part is below another part

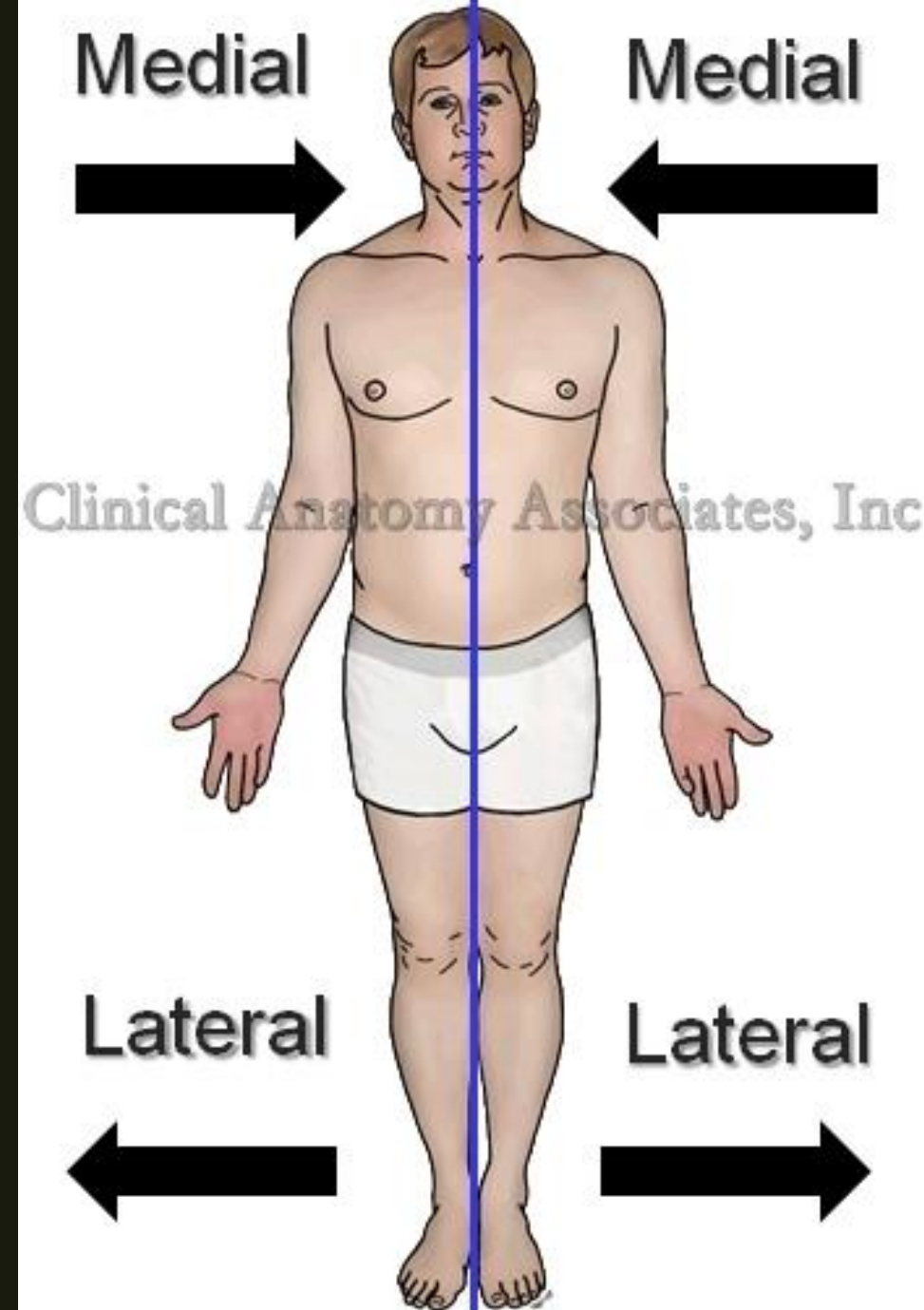
Anatomical Positions



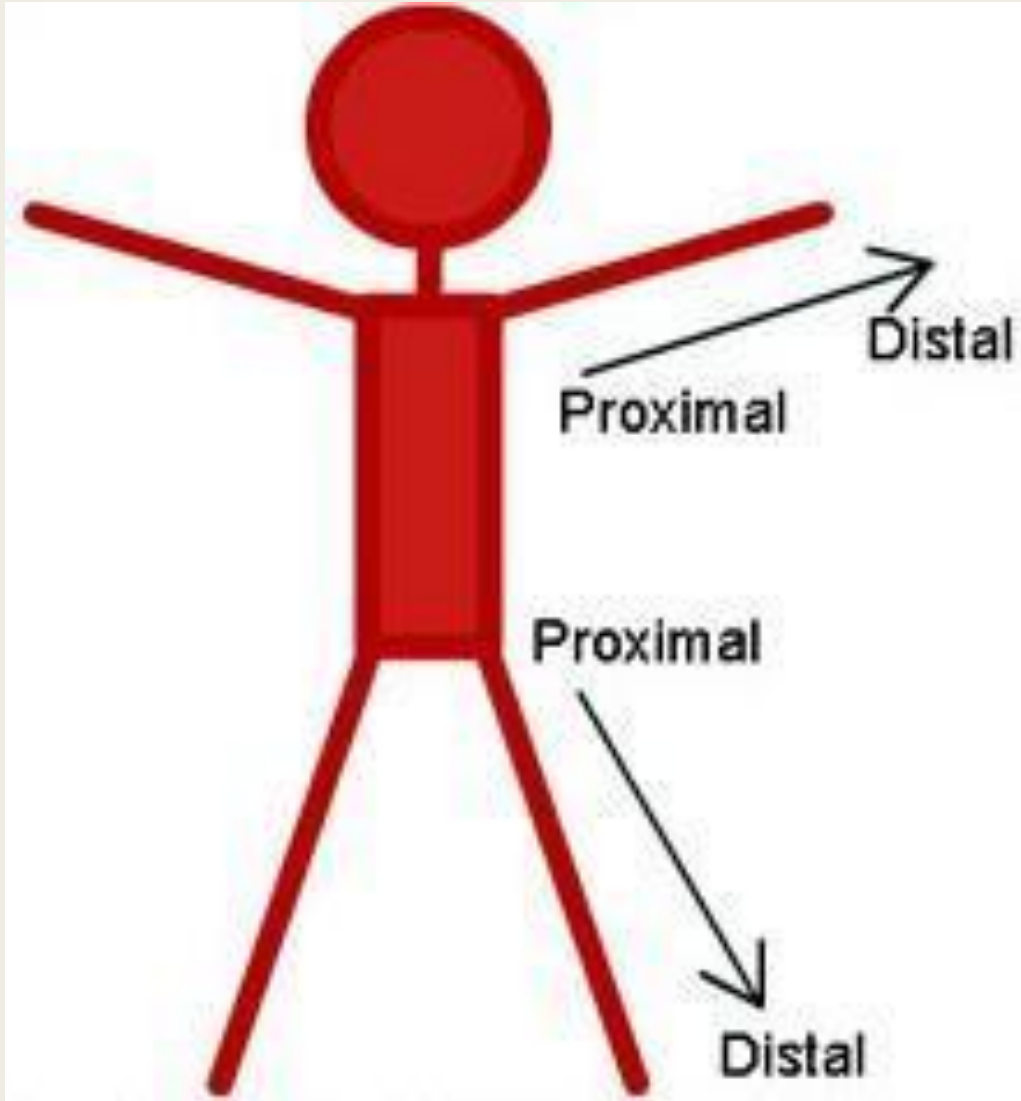
- Anterior: body part is towards the front of the body.
- Posterior: body part is towards the back of the body.

Anatomical Positions

- These directions reference an imaginary midline of the body dividing it into left and right halves.
- Medial: closer to the midline of the body
- Lateral: away from the midline of the body.
- Bilateral: paired structures found on both sides of the midline



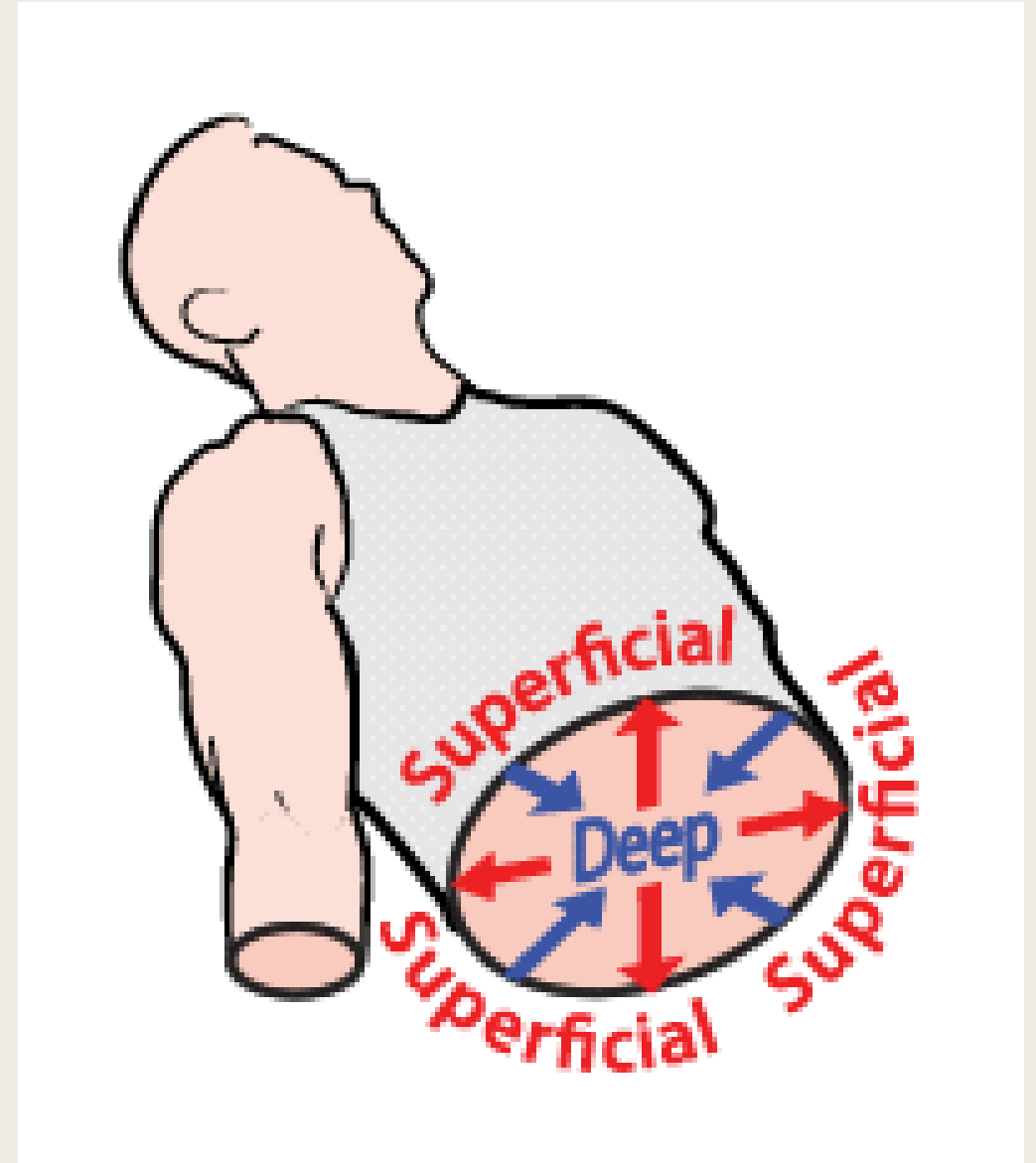
Anatomical Positions



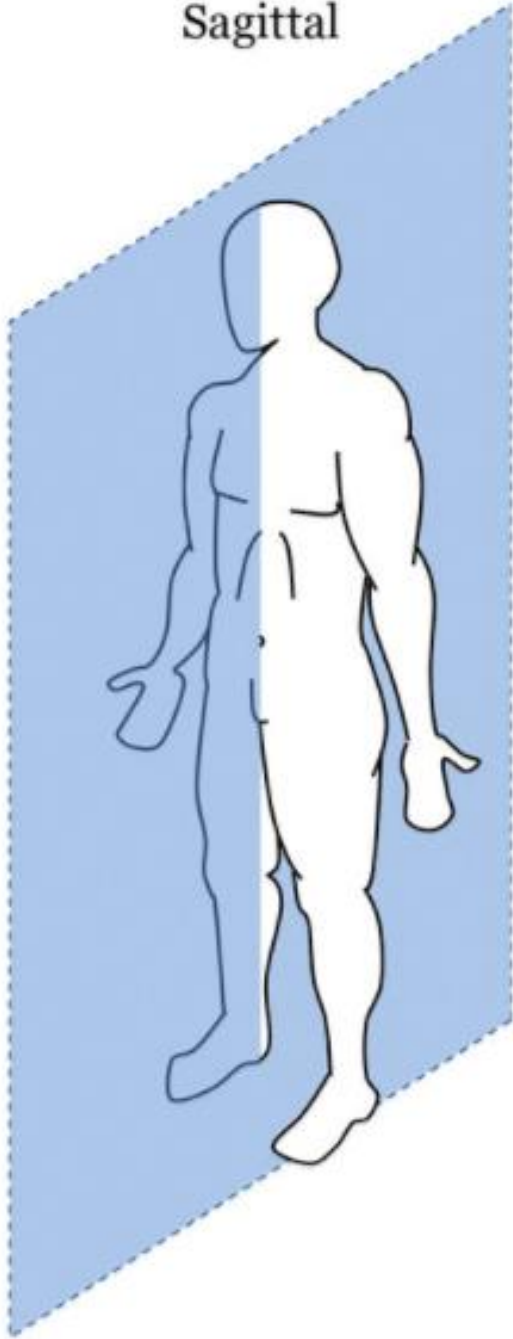
- These directions reference the point of attachment to the trunk of the body.
- Proximal: closer to the point of attachment
- Distal: farther away from the point of attachment.

Anatomical Positions

- Superficial: found near the surface
- Deep: parts found more internal than superficial parts



Sagittal

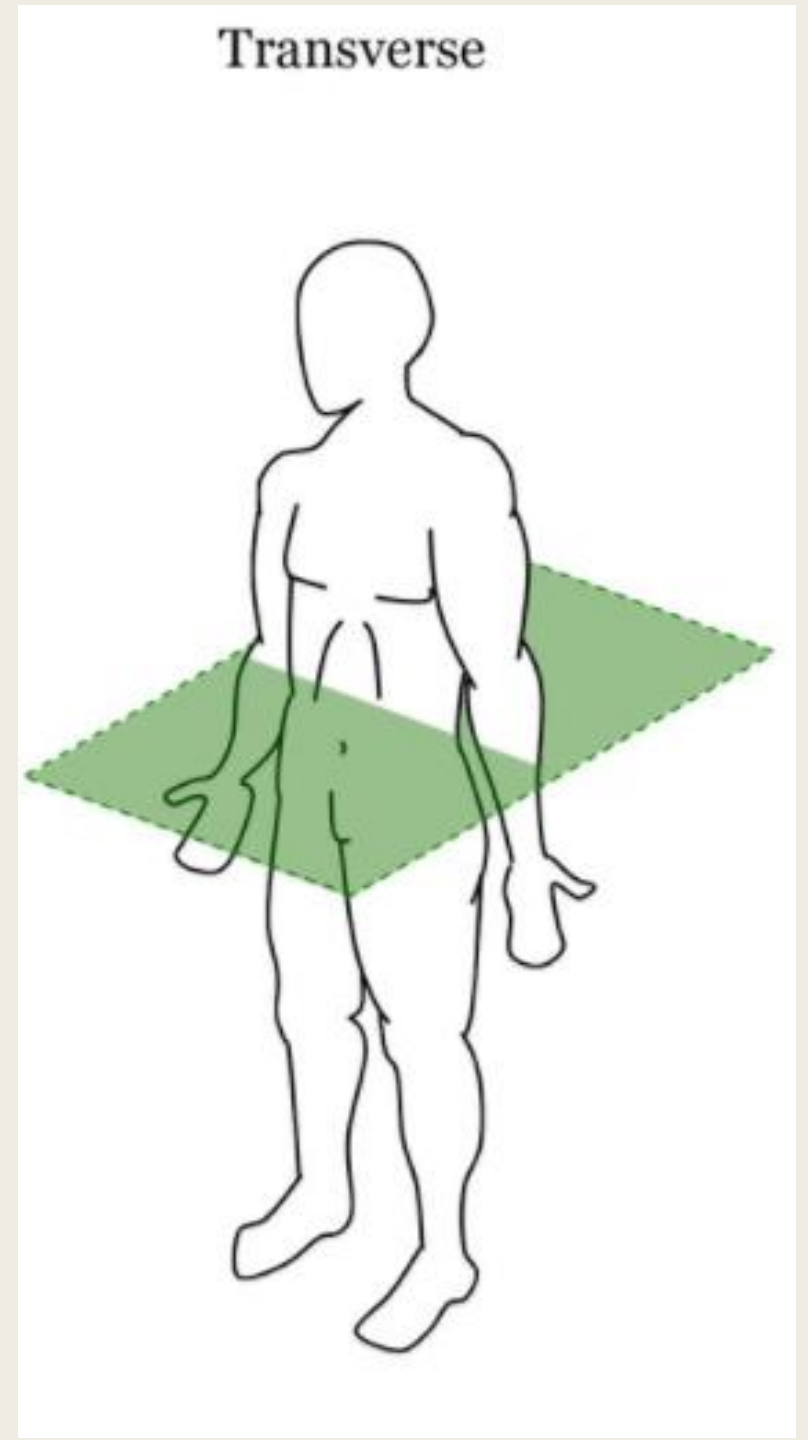


Planes of the Body

- Think of the body planes like the planes in geometry.
 - *A 2-D flat surface that extends infinitely*
- Sagittal Plane: a lengthwise plane that divides the body into right and left portions

Planes of the Body

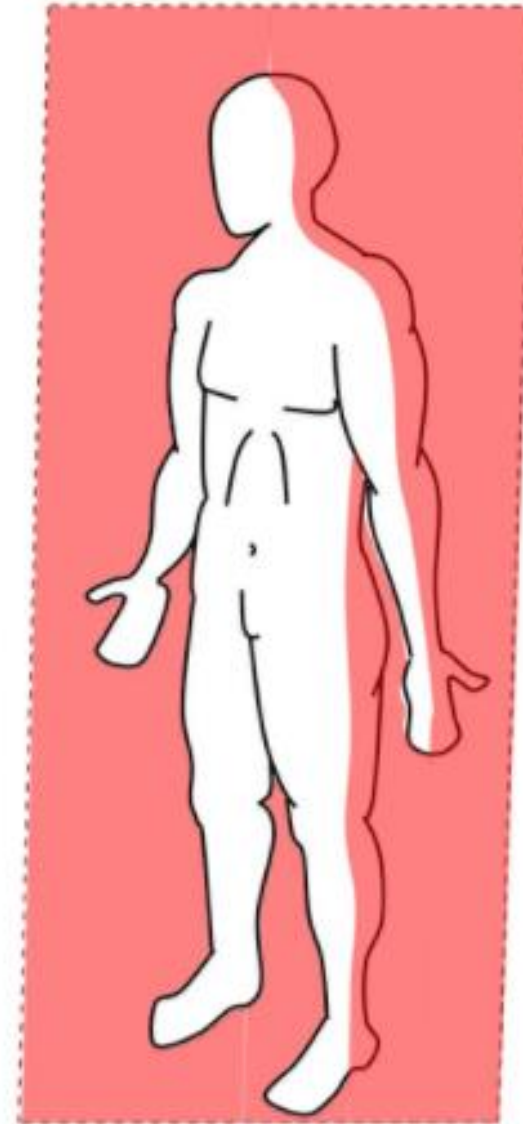
- Transverse: plane that divides the body into superior and inferior portions.

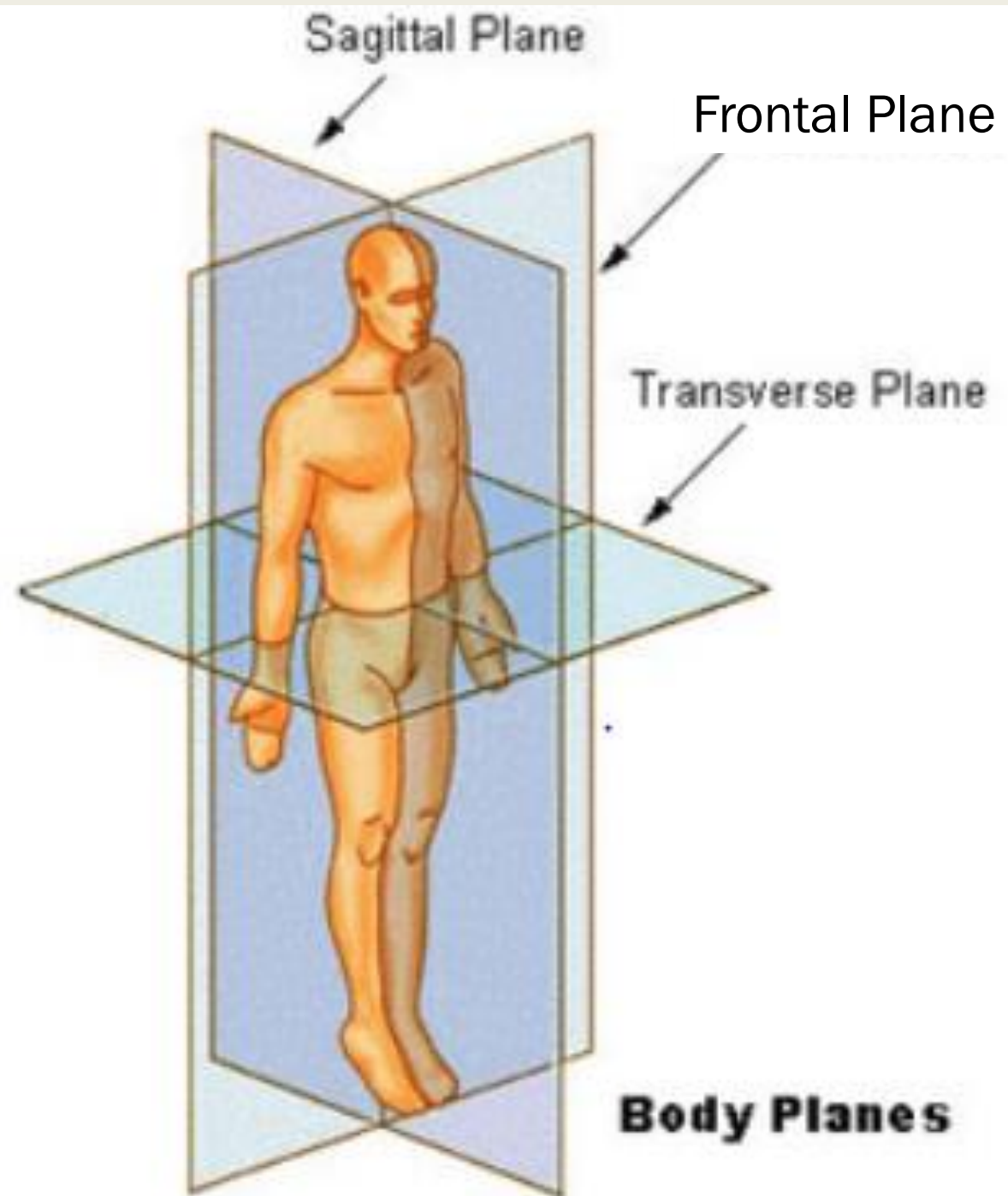


Planes of the Body

- Frontal: plane that divides the body into anterior and posterior portions.

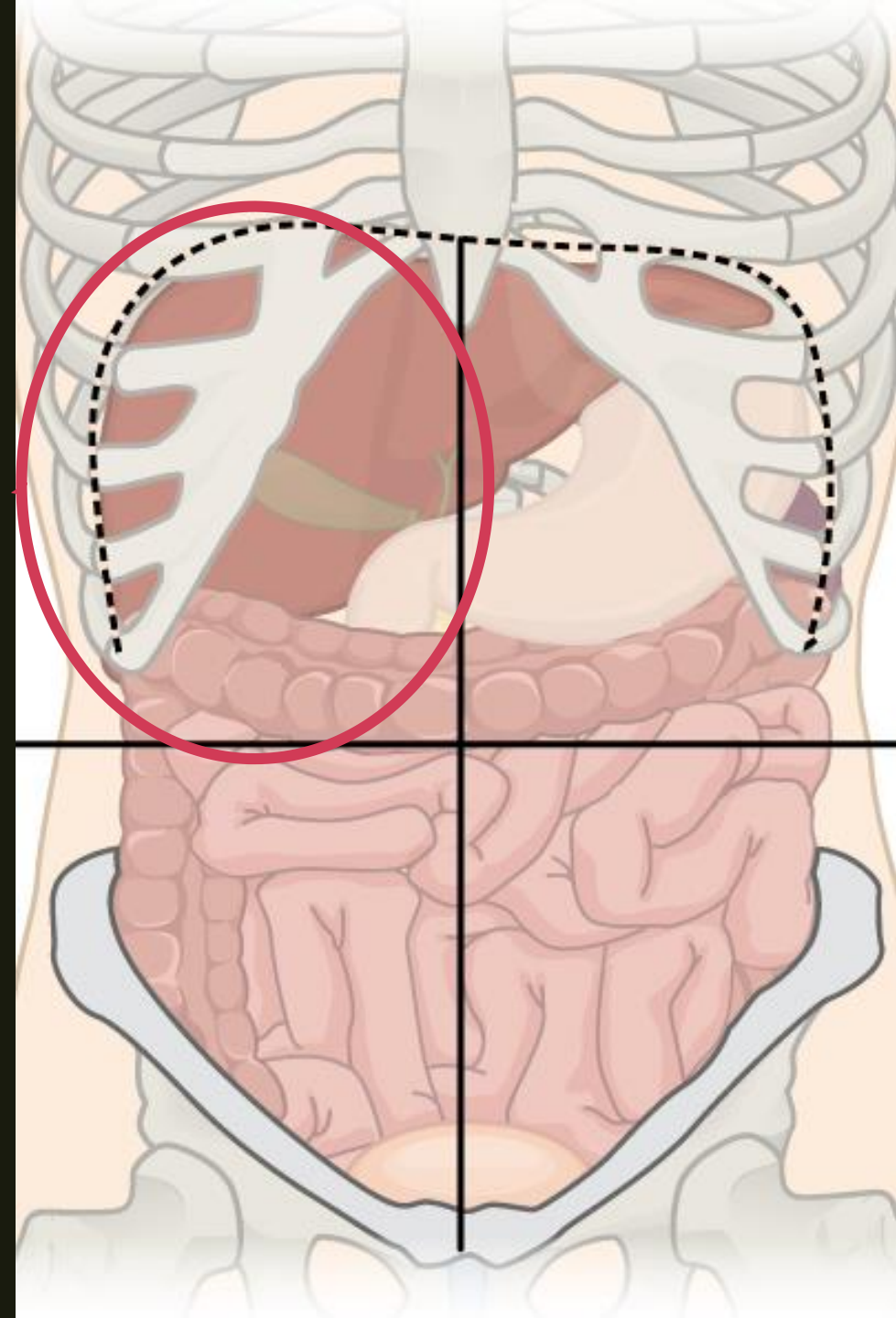
Frontal





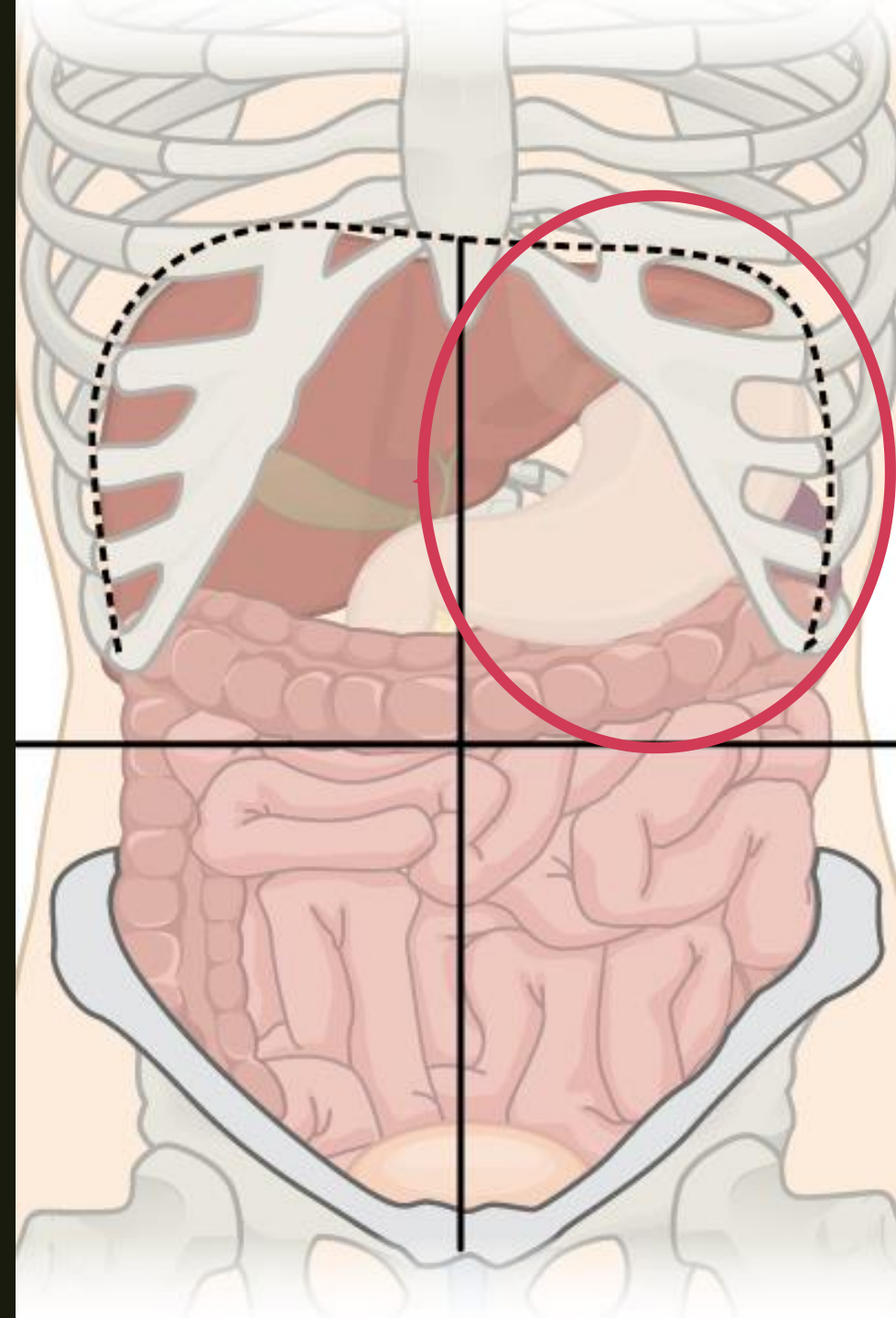
Abdominal Cavity

- Abdominal area is often subdivided into four quadrants
- Dotted line is the diaphragm
- Right Upper Quadrant (RUQ):
 - *Contains the majority of the liver*
 - *Right kidney*
 - *Gall bladder*
 - *Some small intestines and colon*



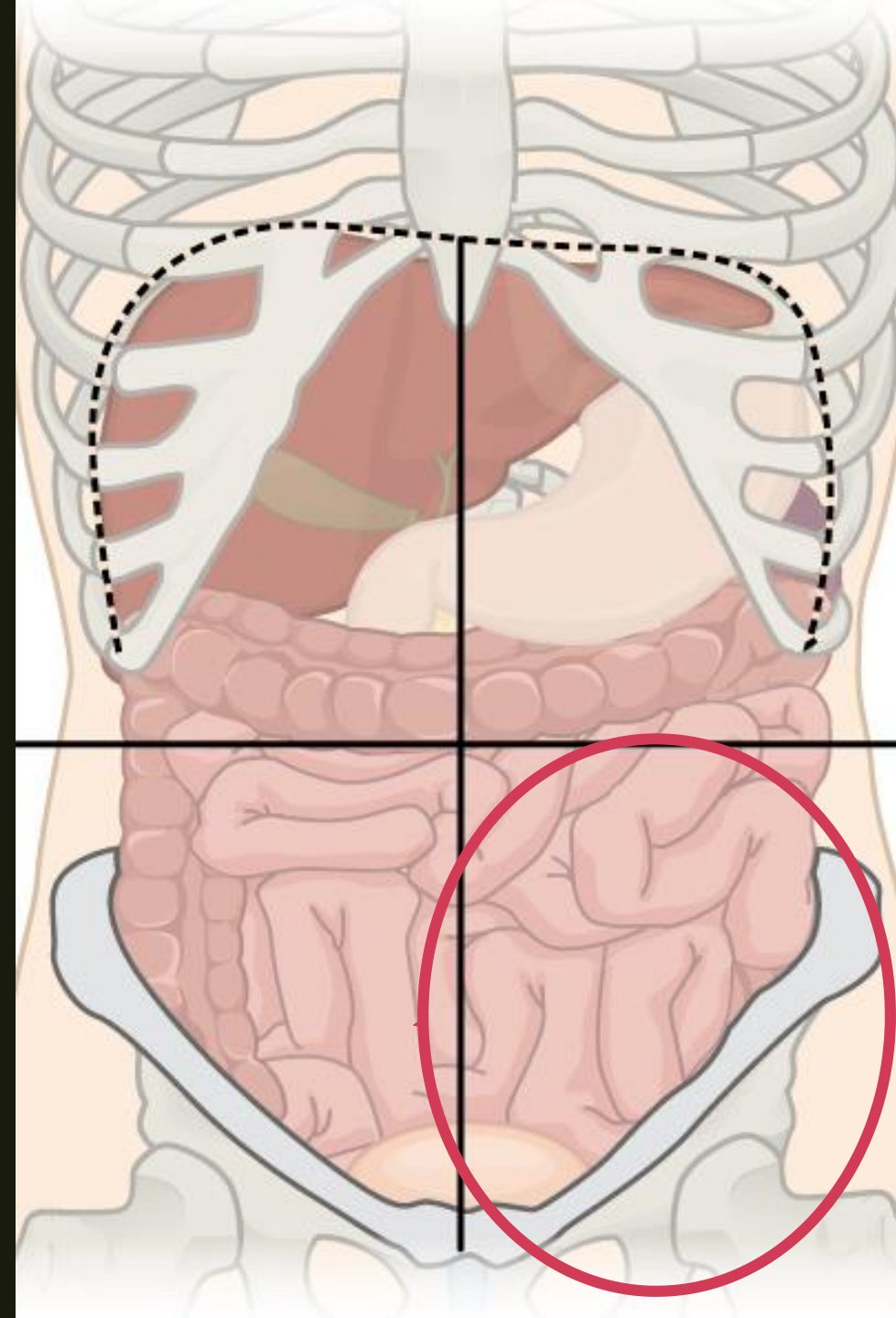
Abdominal Cavity

- Left Upper Quadrant (LUQ):
 - *Spleen*
 - *Left kidney*
 - *Pancreas*
 - *Stomach*
 - *Some small intestines and colon*



Abdominal Cavity

- Left Lower Quadrant (LLQ):
 - *Colon*
 - *Small intestines*
 - *Left ureter and ovary (females)*



Abdominal Cavity

- Right Lower Quadrant (RLQ):
 - *Colon*
 - *Appendix*
 - *Small intestines*
 - *Right ureter and ovary (females)*

