

Lecture 1

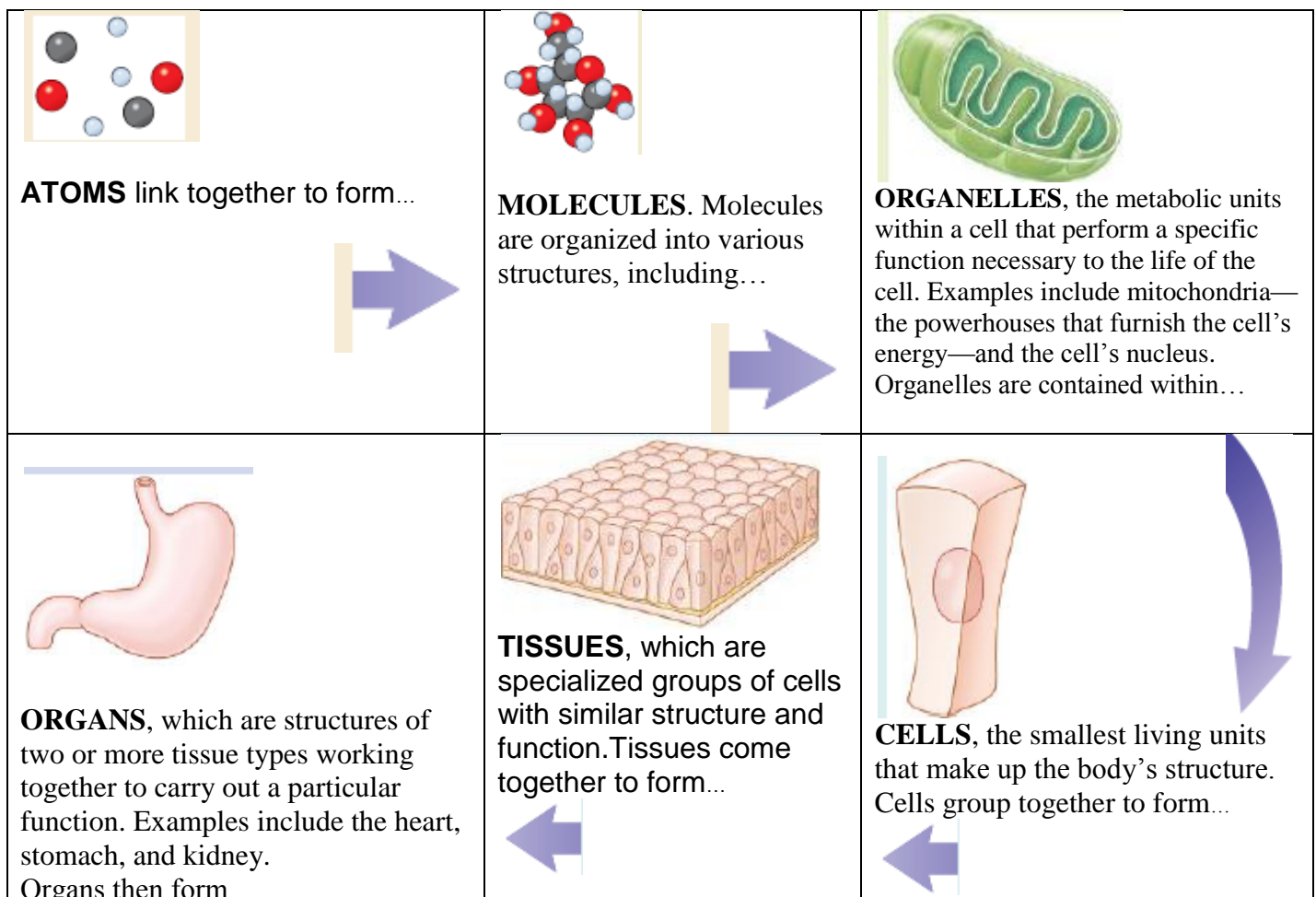
ORIENTATION TO THE HUMAN BODY

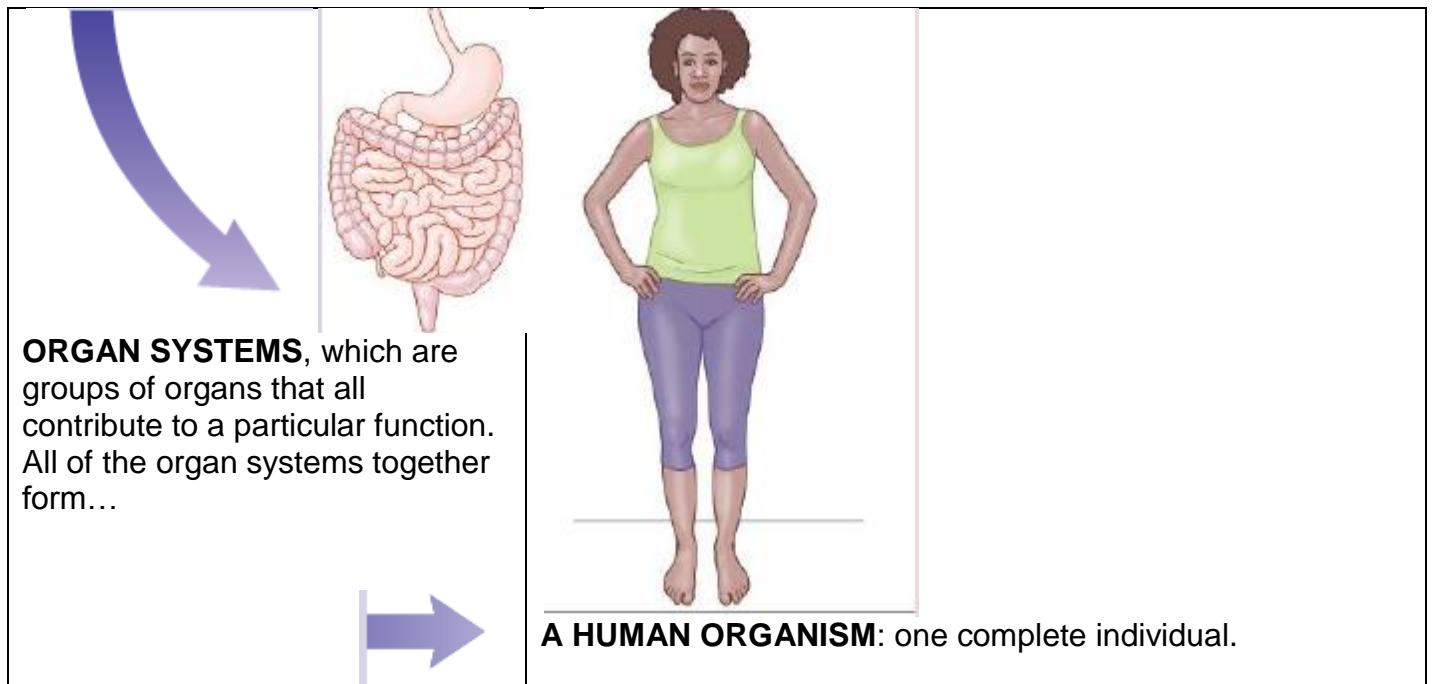
The structure of the body, **anatomy**, is closely entwined with how it functions, **physiology**.

The study of the processes that disturb normal function is called **pathophysiology**. (Patho means suffering or disease; therefore, pathophysiology refers to diseased functioning.)

Organization of the Body

The human body is organized in a hierarchy, ranging from the very simple (a microscopic atom) to the very complex (a human being). Specifically:





Organ Systems

The human body consists of 11 organ systems. The organs of each system contribute to a particular function. However, some organs belong to more than one system. Specifically, the pharynx is part of both the respiratory and the digestive systems, and the male urethra belongs to both the reproductive and urinary systems.



Integumentary system

Consists of skin, hair, and nails

Key functions:

- Protection
- Temperature regulation
- Water retention
- Sensation



Skeletal system

Consists of bones, cartilage, and ligaments

Key functions:

- Protection of body organs
- Support
- Movement
- Blood formation



Muscular system

Consists primarily of skeletal muscles

Key functions:

- Movement
- Posture
- Heat production



Lymphatic system

Consists of lymph nodes, lymphatic vessels, lymph, thymus, spleen, and tonsils

Key functions:

- Role in fluid balance
- Production of immune cells
- Defense against disease



Respiratory system

Consists of the nose, pharynx, larynx, trachea, bronchi, and lungs

Key functions:

- Absorption of oxygen
- Discharge of carbon dioxide
- Acid-base balance
- Speech



Urinary system

Consists of the kidneys, ureters, urinary bladder, and urethra

Key functions:

- Excretion of wastes
- Regulation of blood volume and pressure
- Control of fluid, electrolyte, and acid-base balance



Nervous system

Consists of the brain, spinal cord, nerves, and sense organs
Key functions:

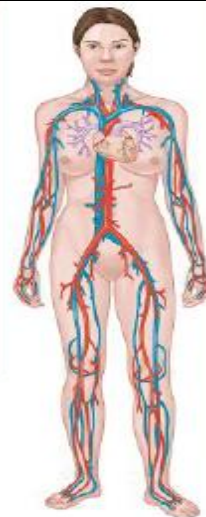
- Control, regulation, and coordination of other systems
- Sensation
- Memory



Endocrine system

Consists of the pituitary gland, adrenals, pancreas, thyroid, parathyroids, and other organs
Key functions:

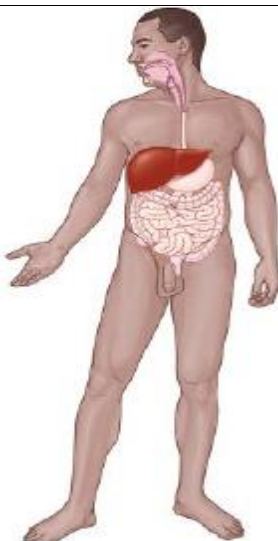
- Hormone production
- Control and regulation of other systems



Circulatory system

Consists of the heart, arteries, veins, and capillaries
Key functions:

- Distribution of oxygen, nutrients, wastes, hormones, electrolytes, immune cells, and antibodies
- Fluid, electrolyte, and acid-base balance



Digestive system

Consists of the stomach, small and large intestines, esophagus, liver, mouth, and pancreas
Key functions:

- Breakdown and absorption of nutrients
- Elimination of wastes



Male reproductive system

Consists of the testes, vas deferens, prostate, seminal vesicles, and penis
Key functions:

- Production and delivery of sperm
- Secretion of sex hormones



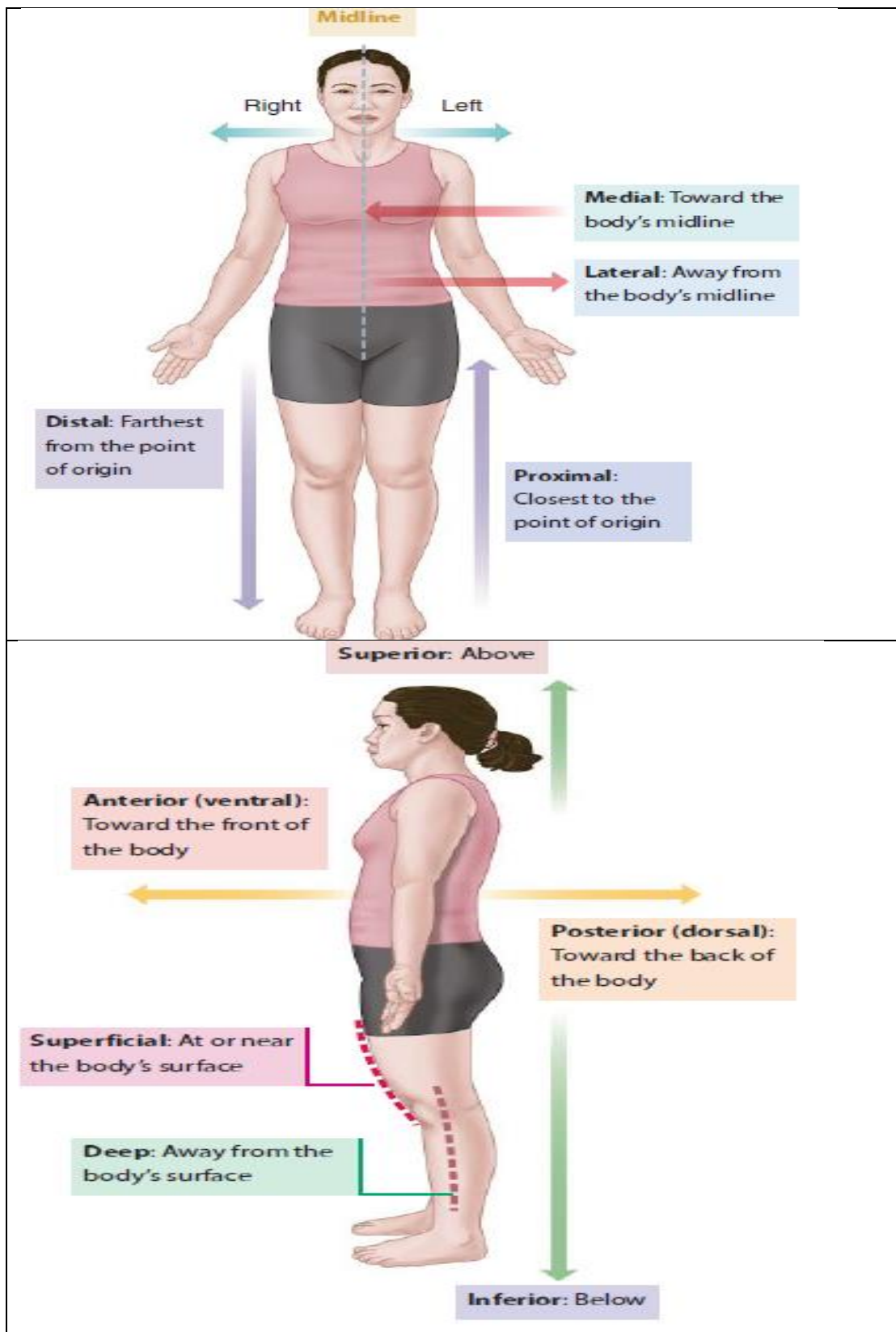
Female reproductive system

Consists of the ovaries, fallopian tubes, uterus, vagina, and breasts
Key functions:

- Production of eggs
- Site of fertilization and fetal development
- Birth
- Lactation
- Secretion of sex hormones

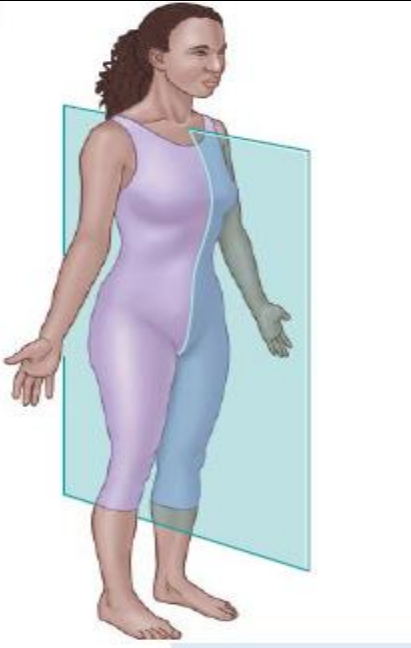
Directional Terms

Directional terms are generally grouped in pairs of opposites. The terms *right* and *left* always refer to the *patient's* right and left side.



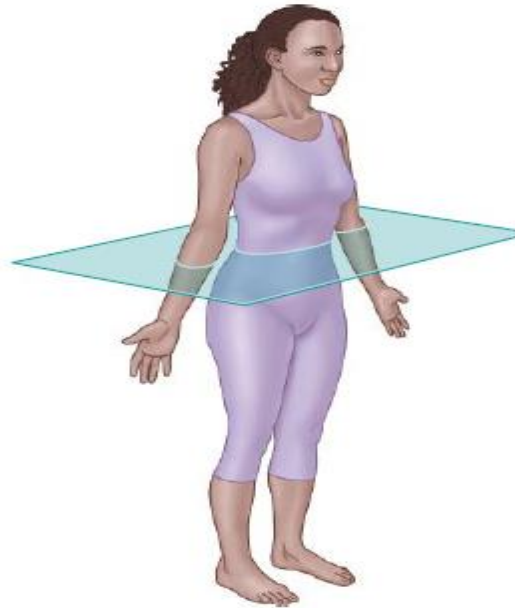
Body Planes

Body planes divide the body, or an organ, into sections.



Sagittal Plane

- Divides the body lengthwise into right and left sides
- Called a *midsagittal* plane if the section is made exactly at midline
- Often used in illustrations to reveal the organs in the head or pelvic cavity



Transverse Plane

- Divides the body horizontally into upper (superior) and lower (inferior) portions
- Also called a *horizontal* plane
- Used to reveal internal organs

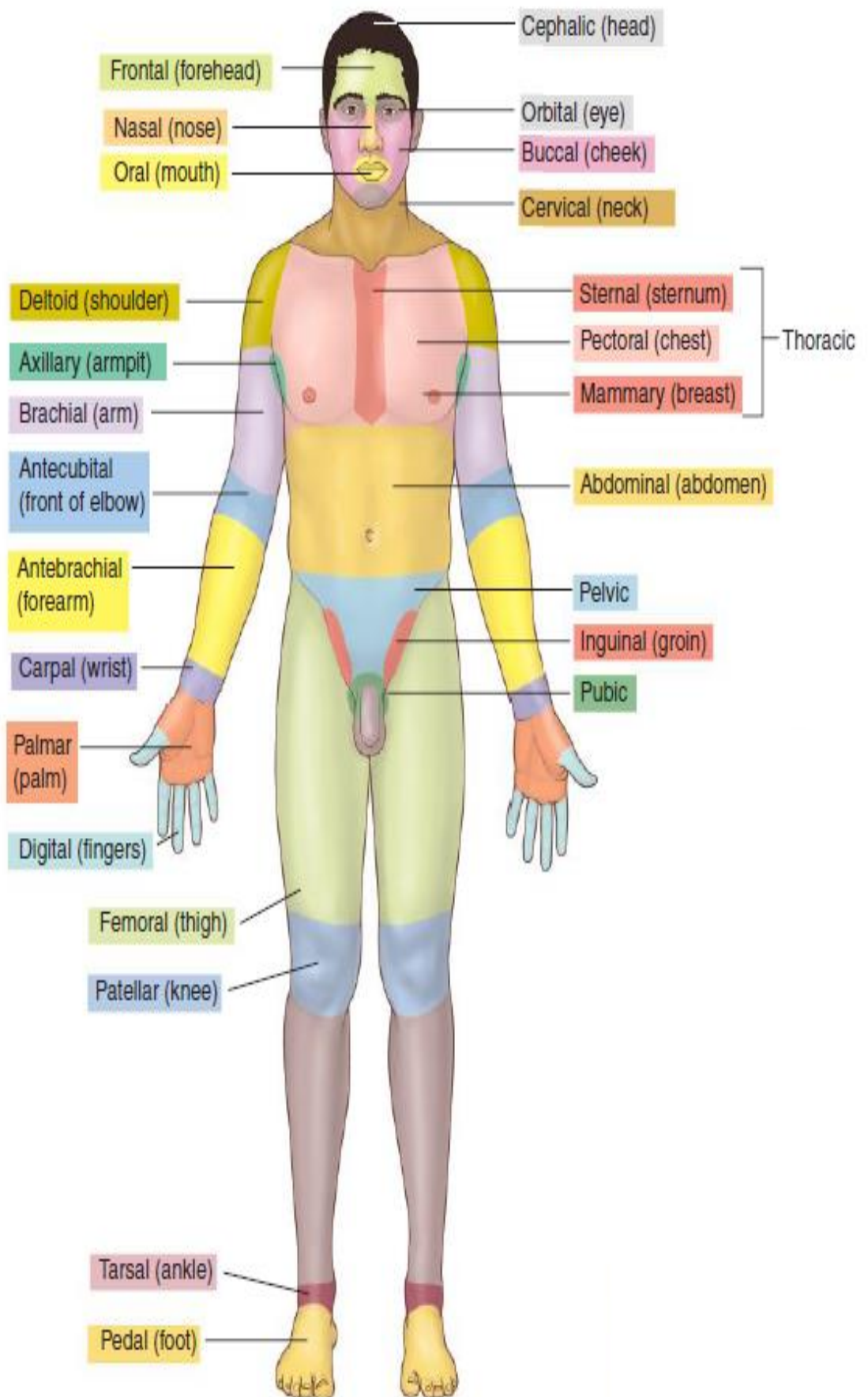


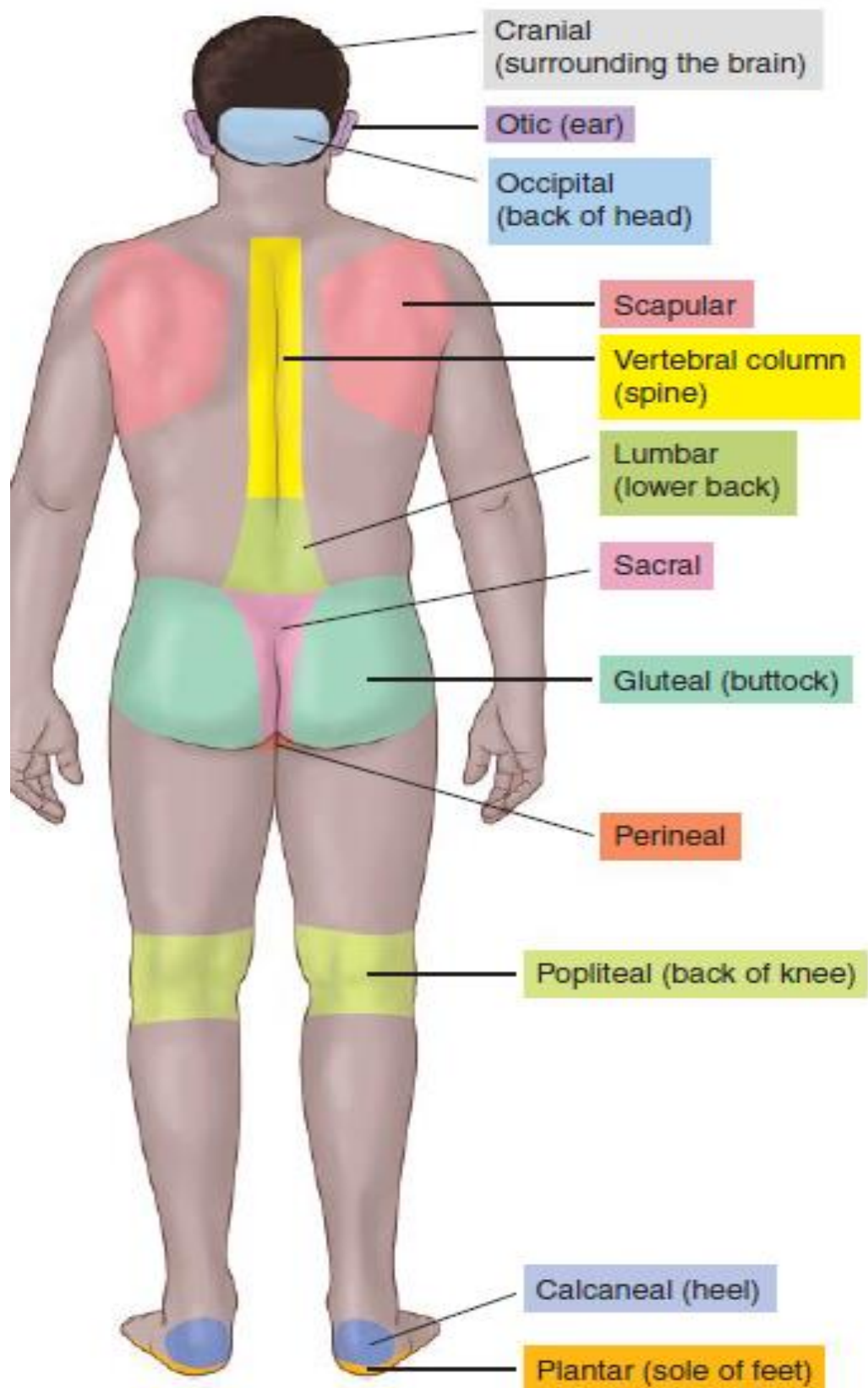
Frontal Plane

- Divides the body lengthwise into anterior and posterior portions
- Also called a *coronal* plane
- Often used in illustrations to show the contents of the abdominal and thoracic cavities

Note:

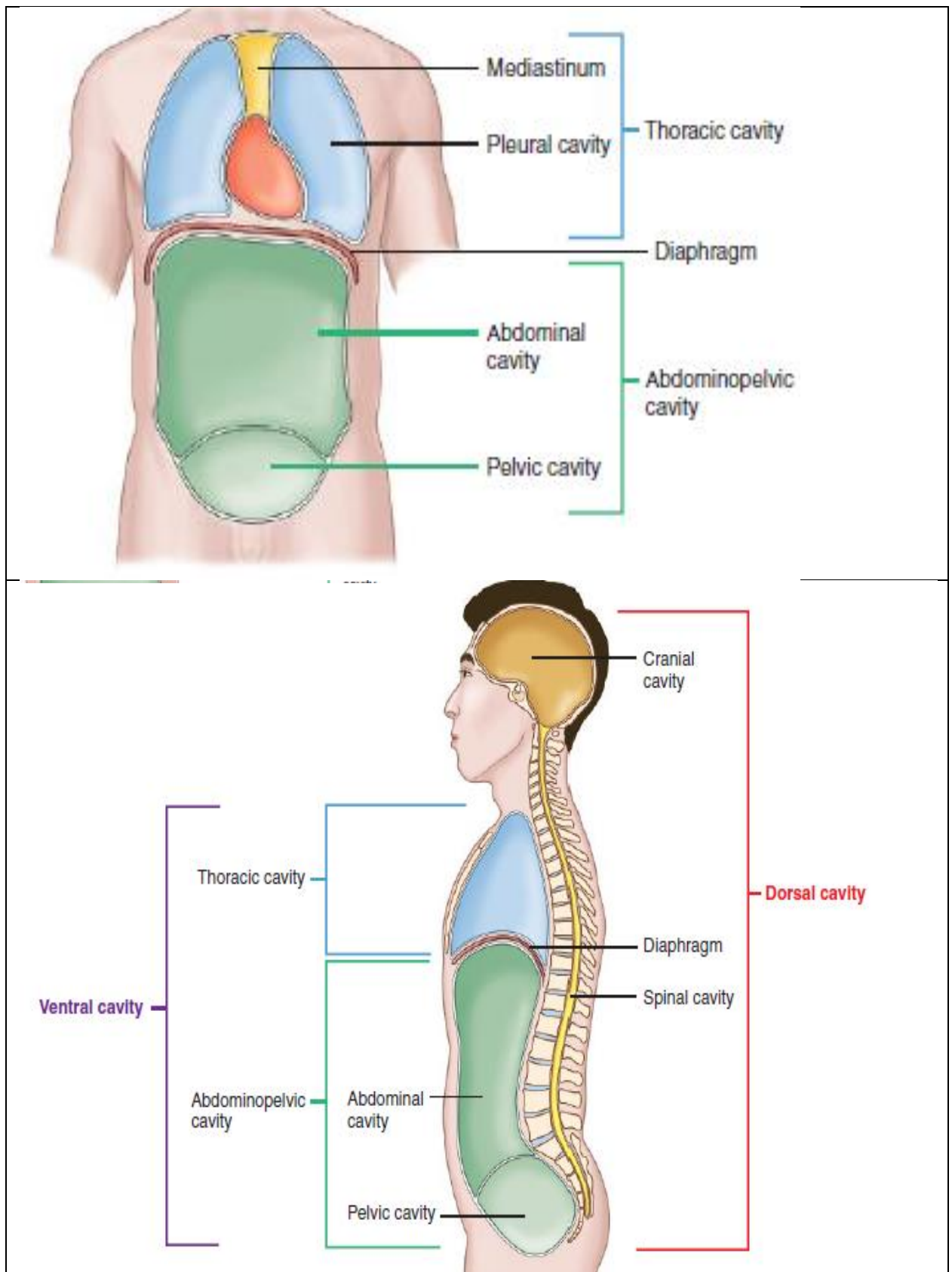
The frontal plane is also called a coronal plane because the line of the plane crosses the top, or crown, of the head. The word *coronal* comes from a Latin word meaning crown.





Body Cavities

The body contains spaces—called cavities—that house the internal organs. The two major body cavities are the **dorsal cavity** and the **ventral cavity**. Each of these cavities is subdivided further, as shown below.

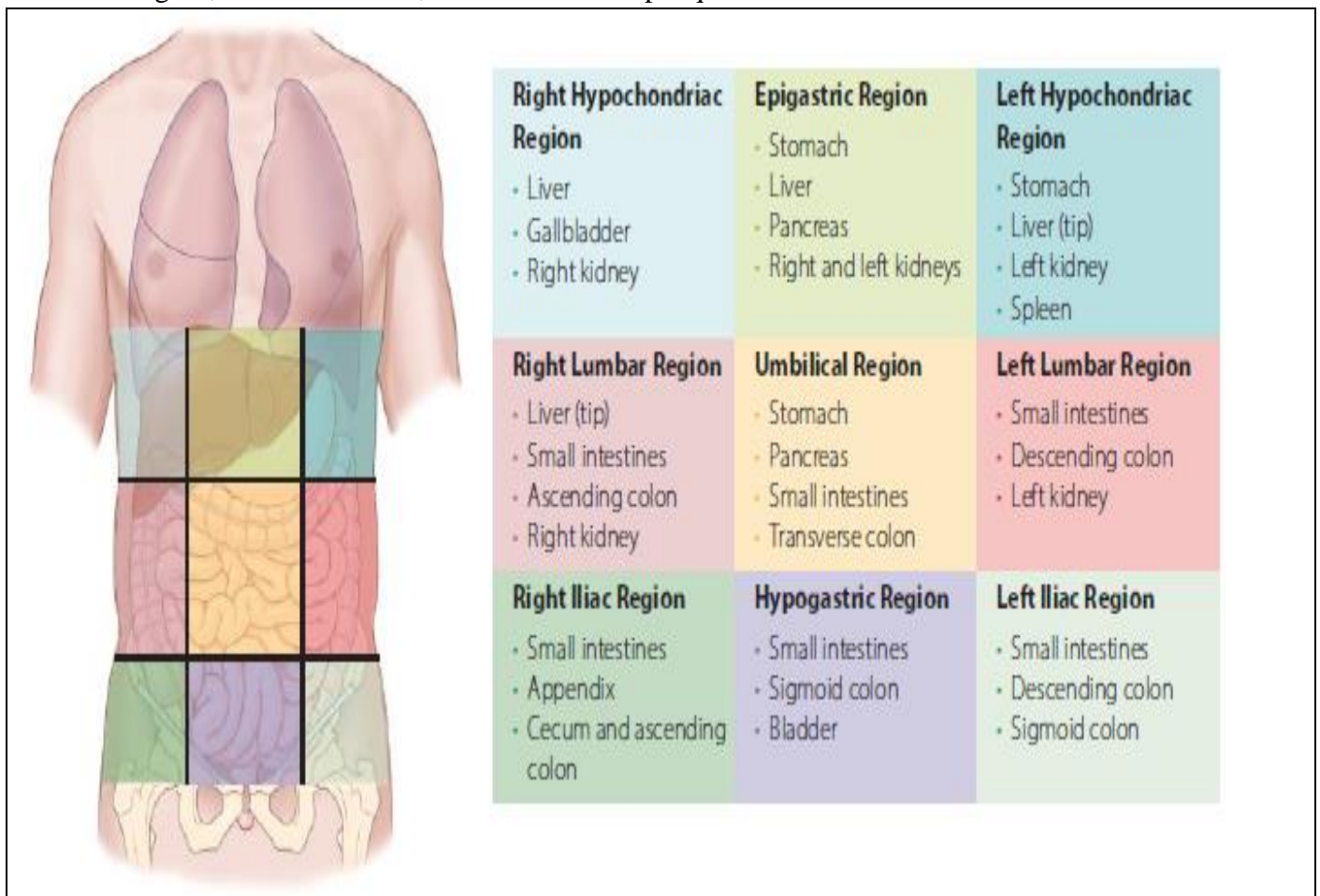


Abdominal Regions and Quadrants

Because the abdominopelvic cavity is so large, and because it contains numerous organs, it's divided further into regions (which are used to locate organs in anatomical studies) as well as quadrants (which are used to pinpoint the site of abdominal pain).

Abdominal Regions

The illustration below shows the location of the nine abdominal regions. The chart beside it lists some (but not all) of the organs found in each quadrant. Note that some organs, such as the liver, stretch over multiple quadrants.



Abdominal Quadrants

Probably used most frequently, lines intersecting at the umbilicus divide the abdominal region into four quadrants

